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Money Demand Stability and Monetary Policy in Fast Growing Economies: Evidence from Malaysia

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ABSTRACT

The objective of this paper is to estimate and test the stability of money demand function in Malaysia using the cointegration and error-correction techniques on a quarterly data on real money balances, real output, real exchange rate and interest rates on Government securities, from 1991:I to 2003:4. The cointegration tests indicate that both M1 and M2 are cointegrated with the specified independent variables. The estimated vector error-correction system supports a single cointegrating equation and a stable long-run real money demand function in Malaysia. The coefficients on all the variables carry correct signs and are significant (except the coefficient on real exchange rate). The finding of strong causality running from money (both narrow and broad) to output affirms the critical importance of money as an important instrument for reviving the economic activity in the short run. The Granger-causality implied by this result is compatible with Keynesian and Monetarist macroeconomic theoretical foundation that money is not neutral in the short run. The findings indicate that M2 has the strongest causal effect on the real output. Finally, the finding of a single stable long-run money demand function has important policy implication for Malaysia in that if the central bank wants to control the total liquidity in the economy, it can do so by identifying appropriate medium-term growth targets for money supply and manipulate interest rates and reserve money.

INTRODUCTION

In the mid of 1997, the East Asian economies suffered their worse crises which were sparked off by speculative attacks on their currency and equity markets. Goldstein and Hawkins (1998) group the sources of these crises into (i) financial-sector vulnerabilities such as poor credit assessment in some emerging Asian economies with relatively easy global liquidity conditions, (ii) external-sector problems which generated some concerns about balance of payments developments, and (ii) contagion from Thailand which quickly spread to its immediate neighbors (Indonesia, Malaysia and Philippine) and then to South Korea, Taiwan, Hong Kong and Japan. This contagion appeared to have emerged from the realization by the market that a number of Asian economies had the same vulnerabilities as Thailand whose currency, the Baht, had plummeted in May 1997.

Speculators took the action when they felt that the depreciation of these countries' currencies was due to disequilibria in macroeconomic variables after almost a complete decade of high growth. Particularly, the second half of 1997 and the first week of September witnessed steep declines in the US dollar exchange rates of the Asean-4 (Indonesia, Malaysia, Philippine and Thailand). The worst affected was the Indonesian rupiah which lost a fifth of its pre-June 1997 value against the greenback. In Malaysia the crisis culminated in the depreciation of the national currency, the ringgit, by about 95 percent, from its par value of RM2.5 per US dollar before July 1997, to about RM4.88 per US dollar in January 1998. Between July 2, 1997 and September 2 1998, the ringgit plummeted to a record low of RM4.86 to the U.S. dollar (on January 7, 1998). Other Asian economies of Singapore, South Korea, Hong Kong and Taiwan currencies experienced moderate state of crisis.

In the aftermath of the crises, a number of important developments are worth noting. In the first place, the Asean-4 countries and South Korea had increased interest rates during 1996 as means of curbing credit growth or supporting their exchange rates. It is being argued[1] that these high interest rates increased the vulnerability to attacks as the speculators' strenuous efforts to push up the cost of 'holding on' to exchange rate commitment begun from a relatively high base. Secondly, as the pressures on exchange rate markets continued to intensify, each of the Asean-4 countries further increased short-tern interest rates aimed at preventing those pressures from intensifying further. Thirdly, in order to control the crises from getting out of hand, each Asean-4 countries resorted to a mixture of administrative measures, taxes and moral suasion with view to discouraging capital outflows and short sales of both the domestic currency and domestic equities and at reducing the need for even larger increases in domestic interest rates. On September 2 1998, the Malaysia government introduced a ban on

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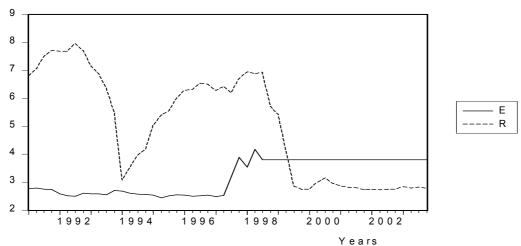
[1] See Goldstein and Hawkins (1998).

short selling of equities, although it was lifted shortly. A $20 billion plan to support the stock prices was also introduced, under which shares sold by Malaysians to state and investment funds would receive a premium whereas equities sale by foreigners would take place at market prices. Capital controls and the pegging of the Malaysian currency to the US dollar at MYR 3.80/US $ were important components of these measures. How the exchange and interest rates would have behaved in the second half of 1998 in the absence of these administrative measures is a matter of debate. However, one important thing that remains clear is that these measures did not prevent Asean-4 exchange rates from declining nor did they prevent the need for domestic interest rates from rising steeply. Figures 1 and 2 show these economic developments during 1991:1 to 2003:4.

Figure 1: Logarithmic Values or Real M1, real M2 and real GDP over 1991:1-2003:4.

Figure 2: Exchange rates and Interest rates over 1991:1-2003:4.

The conjecture posited in this paper is that such remarkable developments are likely to introduce structural instability in money demand function in an economy. It is generally believed that the financial innovations of the 1970s (money market accounts, NOW accounts, electronic transfers) might have changed the working definitions of money even though the official definitions remain unchanged. These developments provide sufficient *apriori* reasons for hypothesizing that money demand function would likely exhibit some instability. Hossain (1993) and Butkiewicz and McConnell (1995) report some evidence relating the effect of financial deregulation and reforms to instability in money demand functions in Bangladesh and US respectively.

The objective of this paper is to estimate and test the stability of money demand function in addition to examining the short-run dynamics as well as the long-run relationship between macro-variables and money demand in Malaysia. To achieve this objective, the paper will fit the Johansen multivariate cointegration and vector error-correction technique on quarterly time-series data on real money demand (M1 and M2), real output as a scale variable, real exchange rate and interest rates on government securities over the period from 1991:1 - 2003:4. The rest of the paper is arranged in sections as follows. Section II examines the literature on previous study of money demand function while Section III presents the empirical model and econometric methodology used to estimate the empirical model. Section IV contains the empirical results and their discussion whereas section V presents the paper conclusions and policy implications.

LITERATURE ON PREVIOUS STUDIES

The stability of money demand function is an important element in the conduct of monetary policy if central banks are to rely on money demand function for accurate identification of the medium-term growth targets for money supply and the manipulation of interest rates and reserve money to control total liquidity in the economy. An application of unstable money demand function for forecasting could produce unpredictable monetary growth rates and interest rates that might be inconsistent with development objectives in the real economy. For this, it is important that monetary authorities have a complete knowledge of the factors that affect the demand for money and certain about the existence of stable and predictable stable long-run relationship between the stock of money and these factors. A voluminous literature has accumulated as a result of many theoretical and empirical studies carried out in many countries with aim of identifying the determinants and testing the stability of money demand function.

Money demand theories can be loosely grouped into the Classical theory that went from the quantity theory through the so-called equation of exchange to Cambridge equation, (Fisher, 1911; Pigou, 1917; and Marshall, 1923); Keynesian theory (Keynes, 1936), which is based on the famous transactions, precautionary, and the speculative motives for holding money; the monetarist theory (Friedman, 1956) which is based on the general theory of asset demand and the permanent income theory; and finally, the portfolio theories which treat the quantity of money demanded as the outcome of a decision to allocate a fixed amount of wealth. A number of studies (Friedman, 1956 and Friedman and Schwartz, 1991) have shown that money demand function assumes a remarkably stable stationary long-run relationship between real money balances, real income, and the opportunity cost of holding real balances until mid-1970s. However, the stability of M1 demand function started to break down from 1970s. As a result, existing money demand functions were over-predicting money demand. The phenomenon, dubbed as the case of "missing money[2]" presented a major challenge for policymakers and researchers that relied on these functions for predicting the effect of monetary policy.

The apparent breakdown of M1 demand function in the 1970s and subsequently, M2 in 1990s, sparked off increasing interest in re-specifying money demand functions, using different components of money stock. Consequently, a number of studies, for example, Koĝar (1995), Shen and Huang (1999), Georgopoulos (2000), Slok (2002) and Ho (2003), find that M1 money demand function is more stable than any other component of money stock. However, Haug and Tam (2001) show that linear specification with M0 provides better fit than M1 whereas Hayo (2000) finds that while M1 money demand function was unstable, M2 money demand function displays long-run stability. Nevertheless, a number of studies have estimated broad money demand functions and find strong long-run stability of such functions. For example, Coenen and Vega (1999), Nachega (2001), Paustian *et al* (2001), Jonsson (2001), Meshach (2002) and Bruggeman *et al* (2003) confirm the existence of a sufficiently stable long-run relationship between broad money demand and the specified independent variables.

THE EMPIRICAL MODEL AND METHODOLOGY

Long-run demand for money, whether derived from Keynesian theoretical models relating to the transaction demand theory (e.g., Baumol, 1952; Tobin, 1956; Laidler, 1984), Monetarist models based on the quantity theory of money (Friedman and Schwartz, 1982) or the portfolio balance approach (Tobin, 1968), is positively related to the price level, P, and income and/or wealth, Y and negatively to its opportunity cost, the own interest rate(s), R. Following Nachega (2001) and Meshach (2002), the demand for money, which is a choice between alternative real assets and financial assets available to wealth holders, is specified as follows:

$$(M^d / P) = f(Y, R) \tag{1}$$

where

M^d = demand for nominal money balances;
P = the price level;
Y = scale variable (income, wealth, expenditure, in real terms); and
R = vector of expected rates of return (within and outside broad money).

The above specification, which represents the long-run real money demand function, assumes a long-run unitary elasticity of the nominal cash balances with respect to the price level. The function is assumed to be increasing in both Y and the rates of return associated with assets included in M and decreasing in those elements of R representing rates of return on alternative assets.

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[2] See Goldfield (1976).

In most empirical work, β_1 is found to be unity so that price homogeneity is imposed in order for the model to become the demand for real money balances. Furthermore, Huang et al (2001) argue that, in the long run, the demand for money, in open economies, depends mainly on real income and interest rates, in addition to exchange rates. As a result, the above model can take this alternative log-linear form with exception of interest rate as follows:

$$(m^d - p)_t = \beta_0 + \beta_1 y_t + \beta_2 e_t + \beta_3 R_t + \varepsilon_t \tag{2}$$

Where ε_t is the error term. With lower-case letters representing the logarithm of a variable, m_t is the log of real money supply in period t, y_t is the log of real GDP in period t, e_t log of real exchange rate at period t and R_t is the interest rate at period t. The expected signs for the β_i's are $\beta_1 > 0$, or specifically, $\beta_1 = 1$ for the quantity theory or $\beta_1 = 0.5$ for the economies of scale (Baumol-Tobin model), $\beta_2 < 0$ or > 0, and $\beta_3 < 0$. This model depicts an equilibrium relationship such that for given values of the right-hand side variables and their long-run impact on money demand (i.e., the β_i), money demand is at m^d. The equation assumes an instantaneous adjustment of real money demand and real money supply, although this equilibrium is unlikely to exist in presence of transactions cost and uncertainty[3]. The empirical analysis is carried out using annual time-series data on consumer price index (P_t), real money supply (M_t), interest rate (R_t), real exchange rate (E_t), and real output (y_t) over the sample period 1991:1-2003:4. A dummy variable is included with value 1 before 1998:3 and zero otherwise. All the variables are expressed in log form (except interest rate) and seasonally unadjusted.

The frequent failure of many researchers to investigate time-series properties of the data used and to examine the presence or absence of long-run relationships among the variables is invariably cited as the main reason for such inconclusive and mixed results. The use of the recently popularized cointegration technique has provided some relief in that it clearly identifies multiple cointegrating relationships among the variables, in addition to distinguishing between exogenous and endogenous variables. The technique is based on three important steps. First, prior to testing for cointegration, the properties of individual time series are investigated. This is done by applying the Augmented Dickey-Fuller (ADF) and the Phillip-Perron (PP) tests for detecting the presence or absence of unit roots in the variables. Estimating vector error-correction mechanism (VECM) requires that the data used be stationary because regression s involving nonstationary data may produce spurious results. Secondly, Johansen maximum likelihood method (Johansen, 1988 and Johansen and Juselius 1990) is used to examine the question of cointegration in a multivariate setting. If the variables are cointegrated, then tests involving differenced variables will be mis-specified and some important information will be lost unless the lagged error-correction term is included. While cointegration can indicate the presence or absence of Granger-causality, it does not indicate the direction of causality among the variables. It is only through this vector error-correction mechanism (VECM), derived from long-run cointegrating vectors, that the direction of Granger-causality is detected. The VECM creates an additional channel though which Granger-causality, ignored in previous tests by the standard Granger and Sims, can emerge.

Finally, the Johansen maximum likelihood method is employed to examine the response of changes in dependent variable to changes in independent variables as well as the causal relations among the variables. The inclusion of lagged vector error-correction terms (ECT) as independent explanatory variables in the estimation process will lead to the recovery all the long-run information that was lost in the original estimation process. The application of the Johansen method produces two types of relationships; the short-run dynamics and the long-run causal relationships among non-stationary variables. Granger endogeniety or otherwise of dependent variable is implied by joint statistical significance of the F-tests applied to the coefficients of the lagged explanatory variables (in first difference) and the t-tests applied to the coefficients of the lagged vector error-correction term (ECT)[4]. In other words, if the error-correction term (ECT) is statistically significant, this implies that the variable is weakly endogenous with respect to the long-run parameters. On the other hand, if the sum of the lagged explanatory variables and the ECT are not statistically significant, then there is no short-run Granger-causality among the variables, implying that the dependent variable is econometrically strongly exogenous.

To examine the Johansen and Juselius system closely, let us consider

$$X_t = \Pi_1 X_{t-1} + \ldots + \Pi_k X_{t-k} + \epsilon_t \qquad (t = 1, \ldots, T) \tag{3}$$

where X_t is a sequence of random vectors with components $(X_{1t}, \ldots, X_{pt})$. The innovations to this process, $\epsilon_1, \ldots, \epsilon_T$ are drawn from a ρ-dimensional i.i.d. Gaussian distribution with covariance Λ, and $X_{t-k+1}, \ldots X_0$ fixed. As most economic variables are nonstationary at their levels, VAR models such as (3) generally are

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[3] See Nachega (2001) for further discussion.
[4] For more information, see Engle and Granger (1987).

estimated in first-difference form. Although this approach may produce stationary data, it paradoxically leads to a loss of some important information concerning the long-run relationship between the series and, hence, can be regarded as a source of misspecification if the series are cointegrated. To overcome this shortcoming, Johansen and Juselius (1990) suggest writing equation (3) in the following equivalent form

$$\Delta X_t = \Gamma_t \Delta X_{t-1} + \ldots + \Gamma_{k-1} \Delta X_{t-k+1} - \Pi X_{t-k} + \epsilon_t \tag{4}$$

where

$$\Gamma_i = - I + \Pi_1 + \ldots + \Pi_i \qquad (i = 1, \ldots, k-1)$$

and

$$\Pi = -(I - \Pi_1 - \ldots - \Pi_k). \tag{5}$$

The only difference between a standard first-differenced VAR model (3) and equation (4) is the term ΠX_{t-k}. It is this Π matrix that conveys information concerning the long-run relationship between the X_t variables. If X_t is nonstationary in levels while ΔX_t is stationary, the X_t is integrated of order one.

Cointegration can, therefore, be detected by examining the rank of Π matrix. The rank of a matrix is defined equal to the number of its characteristic roots that differ from zero. As such, the number of independent cointegrating vectors in the system can be determined by testing the significance of the characteristic roots of Π. It is important to note that the rank of the matrix Π is equal to the number of independent cointegrating vectors. If the rank of the matrix Π is zero, then matrix Π is null hypothesis and equation (4) reduces to the usual VAR in first differences. On the other hand, if the matrix Π is of rank n, the vector process is stationary, and for intermediate cases in which $1 < \text{rank}(\pi) < n$, there are multiple cointegrating vectors the number which can be obtained from checking the significance of the characteristic roots that differ from zero.

The short-run version of the above long-run equation can be specified as an error correction model of the form:

$$\Delta m_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta m_{t-i} + \sum_{i=1}^{n} \beta_{2i} \Delta y_{t-i} + \sum_{i=1}^{n} \beta_{3i} \Delta e_{t-i} + \sum_{i=1}^{n} \beta_{4i} \Delta r_{t-i}$$

$$+ \sum_{i=1}^{n} \beta_{5i} ECT_{t-i} + \mu_{it_t} \tag{6}$$

where Δ represent the first difference operator, ΔX_t represents changes in the log of a variable, ECT refers to error-correction terms derived from the long-run cointegration relationships using Johansen maximum likelihood technique and μ_{it}s are white-noise Gaussian random error terms where i = 1, 2, …, n. Equation (6) is the basic equation to be estimated in testing the long-run money demand function in Malaysia.

In light of Granger-causal test, an important consequence of the relationships revealed by this system of equation (6), is that either changes in the real money balances (Δm_t), real income (Δy_t), real exchange rate (Δe_t) and interest rate (ΔR_t) or any combination must be caused by ECT_{t-1} which itself is a function of changes in these variables. The theoretical assumption underlying this is that if these variables share a common trend, then current changes in the dependent variable are partly a result of the dependent variables moving into alignment with the trend value of the independent variables. For example, a change in the real money balances may be partly a result of this variable moving into alignment with trend values of real income, real exchange rate and interest rate.

For the purpose of analyzing the interrelationship among the variables and the dynamic adjustments to various disturbances in the system, equation (6) can be further transformed into its moving average representation as

$$\Lambda X = \sum_{i=o}^{\infty} B_i V_{t-i} \tag{7}$$

where the V_i are serially uncorrelated but are contemporaneously correlated with variance Ω and B_i is an n x n matrix of coefficients representing the dynamic response of each of the variances to shock V_{t-i} after i periods. Given this innovation of representation, the reaction of a given variable to future changes in n-variable system

can be accounted for. By orthogonalizing the innovations in this VAR system, we can transform these correlations by expressing Equation (7) as

$$\Delta X = \sum_{i=0}^{\infty} C_i U_{t-k} \tag{8}$$

where innovations, U_i, become uncorrelated contemporaneously with each other. While the coefficient of matrix C_i represents the response to shocks in particular variables, the variance of each element in ΔX_i is attributable to the source in elements of serially and contemporaneously uncorrelated U. It is through this orthogonalization that the variance decomposition and impulse response functions that analyze further insights about the relationships among the variables can be obtained.

By partitioning the variance of forecast error of a certain variable into proportions attributable to innovations (or shocks) in each variable in the system including its own, variance decomposition, which is termed as an out-of-sample causality tests (Masih and Masih, 1996), can provide an indication of these relativities. In other words, VDCs provide a literal breakdown of the change in the value of the variable in a given period arising from changes in the same variable in addition to others in previous periods. According to Sims (1982), a variable optimally forecast from its own lagged values will have all its forecast error variance accounted for by its own disturbances.

Another fundamental component upon which the VECM analysis is conducted is the impulse response function. Using the moving average presentation of the VAR model, each variable can be described as a function of past innovations, or unexpected shocks, of all the variables in the model. Impulse response function traces the effect of a one standard deviation shock to a variable on the time path of all the variables in the system. In other words, impulse response function measures the effect of shocks on future values of a series relative to some benchmark case. They can generally be used to investigate the persistence of shocks and other properties within the context of an empirical model where the parameters are unknown and the shocks hitting the system unknown too.

THE EMPIRICAL MODEL RESULTS

Unit Root Tests

Estimating vector error-correction mechanism (VECM) requires that the data used are stationary. Stationarity of stochastic process is an important property that ensures the constancy of means, variances and auto-variances through time. Stationarity of the time-series data is essential because regressions ignoring unit roots may produce spurious results that do not provide meaningful interpretation of economic relationships. As the results of these tests generally depend invariably on the number of lags included, lag selection must, therefore, be given a careful attention. For the importance of these tests, Campbell and Perron (1991) general-to-specific elimination procedure is employed to identify the optimal lag structure. Initially we estimate each equation with arbitrary number of lags on the dependent variable. If the lag included was significant, then the number of lags is kept otherwise, the number of lags is reduced by one while continually re-estimating the equation until a significant lagged dependent variable is found. If none of the coefficients on the lagged variables is significant, the test is run without including any number of lags. Therefore, the optimal number of lags found for theses test was 1.

Table 1 summarizes the results of the Dickey-Fuller and Phillips-Perron tests for all the variables at levels and first differences with trend and without. The null hypothesis is that the series is I(1). The test results at levels indicate that the null hypothesis of a unit root could not be rejected for all the variables. The statistical significance of absolute value of test statistics in first difference at least at five percent level indicates that the series are stationary in first differences, and hence, should be employed in causality tests and VAR/VECM in their present form.

Table 1: Unit Root Tests

Variables	ADF		PP Test	
	Constant without Trend	Constant with Trend	Constant without Trend	Constant with Trend
Levels				
y	-1.5607	-3.1462	-1.2996	-2.5221
r	-1.4429	-2.2900	-1.4201	-2.3667
e	-1.7048	-2.2996	-1.8960	-2.3854
m1	-1.0539	-2.0929	-0.8499	-2.0577
m2	-2.4975	-1.1170	-2.0400	-0.7131
First Differences				
y	-8.8244***	-8.8085***	-7.7705***	-7.8443***
r	-4.1231***	-4.0728***	-6.0659***	-6.0057***
e	-4.336***	-4.2919***	-7.8487***	-7.7868***
m1	-4.2327***	-4.3009***	-6.8116***	-6.7524***
m2	-4.8040***	-5.6336***	-6.2152***	-6.8666***

Notes: ***, ** and * indicate 1%, 5% and 10% significance level respectively. These values are provided by the Eviews package output based on Mackinon (1991). Lag truncation is 3 for all the series in Phillips-Perron Test.

Multivariate Cointegration Tests

The Johansen maximum likelihood method (Johansen, 1988 and Johansen and Juselius 1990) is applied to examine the question of cointegration among the variables. Before conducting the cointegration tests, it is necessary to determine the dynamic specification of the Johansen model. This is done by estimating the initial equations using the full data set, setting *k*, the optimal lag length, arbitrarily. The unrestricted model is then tested against a restricted version where *k* varies from 3 to 1. These tests determine the number of cointegrating vectors by testing the hypothesis that there are *r* or fewer cointegrating vectors against an alternative that the number of cointegrating vectors is greater than or equal to r. The computed test statistic is asymptotically distributed as χ^2 with n^2 (ρ_1 - ρ_0) degrees of freedom. The results of cointegration test on the specification are reported in Table 2 in which both the maximum eigenvalue and trace tests simultaneous indicate the existence of one cointegration equation, hence, rejecting the null hypothesis of zero cointegration at the 95% critical value for M1 and M2 models. Having said that, this implies that the variables in each of these models are cointegrated with at least one cointegrating equation. Based on these results, the study establishes the long-run relationship among real money demand (m1 and m2), real output, real exchange rate and interest rate in the Malaysia over the sample period.

Table 2: Results of Johansen's Test for Multivariate Cointegrating Equations

Variables: m1, y, e, r, (p = 3)					
H_0	Eigenvalue	Maximum Eigenvalue	Critical value 95%	Trace	Critical value 95%
r = 0	0.5162	34.8534*	31.46	63.8857*	62.99
r ≤ 1	0.3151	18.1694	25.54	29.0320	42.44
r ≤ 2	0.1166	5.9482	18.96	10.8625	25.32
r ≤ 3	0.0973	4.9144	12.25	4.9144	12.25
Variables: m2, y, e, r, (p = 3)					
H_0	Eigenvalue	Maximum Eigenvalue	Critical value 95%	Trace	Critical value 95%
r = 0	0.5842	29.5771*	27.07	55.8515*	47.21
r ≤ 1	0.3869	17.3642	25.54	26.2744	29.68
r ≤ 2	0.2114	8.6542	18.96	9.9102	15.41
r ≤ 3	0.1257	0.2560	12.25	0.2560	3.76

Notes: Whereas r denotes the number of cointegrating vectors, *(**) indicates rejection at the 95% (99%) critical value.

Granger-Causality Test

Testing Granger-causality among the variables is an important component of the VAR first-differenced system since the variables are cointegrated. The error-correction term ECT, derived from long-run relationship, is included in order to avoid mis-specifying the models or omitting important information. Table 3 reports the results of Granger-Causality test, based on error-correction model with uniform lag structure determined by the likelihood ratio test. The significance of the F-test and t-test statistics applied respectively to explanatory

variables (in first differences) and lagged error-correction term in m1 and m2 in addition to real output in both M1 and M2 models of money demand function imply that these variables are weakly endogenous in the VECM system, hence they bear the burden of short-run adjustment in various degrees in order to restore the system to long-run equilibrium. The F-statistic for the lag values of the independent variable in this table confirms the existence of a unidirectional short-run causal effect running from m1 to r and y, from e to r and y, from m2 to y, from e to m2, r and y. In addition, a bi-directional causality is found between r and m1. Since all the variables are cointegrated at the same level, i.e., I(1), the system can be modeled as a vector error-correction model (VECM) in the vector autoregression (VAR) system.

Table 3: Exogeneity Test Based on Vector Error-Correction Model with two lags (Uniform lag lengths)

M1 Model ($\rho = 3$)	Independent Variable				
Dependent Variable	$\Delta m1$	Δr	Δe	Δy	ECT_{t-1} t-statistics
$\Delta m1$	-	0.0006^{***}	0.3064	0.4465	-2.4020^{**}
Δr	0.0027^{***}	-	0.0268^{**}	0.0156^{**}	1.1038
Δe	0.4456	0.5820	-	0.4469	0.4247
Δy	0.0051^{***}	0.6043	0.0283^{**}	-	-2.0869^{**}

M2 Model ($\rho = 3$)	Independent Variable				
Dependent Variable	$\Delta m2$	Δr	Δe	Δy	ECT_{t-1} t-statistics
$\Delta m2$	-	0.6666	0.0008^{***}	0.8255	2.3885^{**}
Δr	0.2654	-	0.0999^{***}	0.2186	-0.5212
Δe	0.2476	0.5008	-	0.4559	0.0286
Δy	0.0281^{**}	0.9503	0.0076^{***}	-	1.7047^{*}

Notes: ***, ** and * denote significance levels at 1 percent, 5 percent and 10 percent levels respectively.

The first estimated eigenvectors would form the maximum likelihood estimate of the cointegrating vector[5], β. By normalizing on changes on the log of real broad money, we can obtain the following long-run broad money demand function:

$$m2_t = 0.0110\, e_t - 0.0456\, r_t + 1.918\, y_t$$
$$(0.1674) \quad (0.0099) \quad (0.0954)$$

Based on the signs and magnitude of the estimated coefficients, the cointegrating equation shown above can be interpreted as defining the long-run demand for real broad money in the Malaysia. In this equation, the coefficients on all the variables carry the expected correct signs as the theory predicts. In other words, the demand for real broad money in Malaysia is positively related to income and currency's depreciation rate and negatively related to the interest rate in the long run. The income elasticity of real money demand is positive and more than unity (1.92), contrary to Baumol (1952) and Tobin 1956) hypothesis. It is comparable with those of Macau (1.97), Germany (1.72), UK (1.61) and China (1.58)[6]. A test imposing unitary income elasticity was rejected: $\chi^2(1) = 163.40(0.0000)$. The rejection of unitary income elasticity implies that changes in real output have induced more than proportionate increase in real broad money in Malaysia over the sample period, implying that broad money velocity has not been constant during the period. The coefficient on semi-elasticity with respect to inflation (0.046) is significantly negative and comparable with those of China (-0.05) and Germany (0.031). Similarly, demand for real broad money in the Malaysia is positively influenced by the depreciation of domestic exchange rate, that is, a real depreciation of Ringgit Malaysia raises the demand for real broad money balances.

This restricted vector error-correction model was subjected to and has passed a number of diagnostic tests, which include serial correlation based on inspection of the autocorrelation functions of the residuals as the Lagrange Multiplier, the ARCH (4), the normality and hetroscedasticity tests. In addition, to check whether the estimation regression equations were stable throughout the sample period, the plots of CUSUM and CUSUM of square tests (Figure 3) fall inside 5% critical lines, implying that the estimated parameters of demand function are stable in Malaysia during the sample period[7].

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[5] See Charemza and Deadman (1992).
[6] See Ho (2003).
[7] The test results are not reported here.
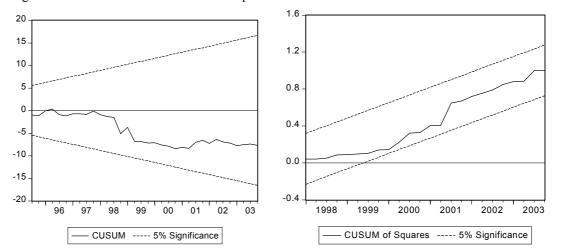
Figure 3. Plots of CUSUM and CUSUM Square for VECM for M2 model

Variance Decompositions

The second fundamental component upon which the standard VAR analysis is conducted is the variance decomposition function (VDCs). Further insights about the relationships among the macroeconomic variables can be obtained from analyzing variance decompositions. Variance decomposition analysis provides an indication of the dynamic properties of the system. Masih and Masih (1996) have acknowledged that, although the VECM can help to visualize the direction of causality within the sample period, it does not provide us with sufficient dynamic properties of the system. In addition, it does not measure the relative strength of the variables beyond the sample period. While the authors consider VECM analysis as a within-sample causality test, they regard the variance decompositions (VDCs) as an out-of-sample causality test. Variance decomposition practically decomposes or breaks down variation in each endogenous variable into the component shocks that can be attributed to individual endogenous variables in the VAR system and gives information about the relative importance of each random innovation to the variables in the VAR system.

The ordering of VD is mainly based on theoretical speculation and/or some statistical properties of the system such as the correlation among the residuals and the extent of exogeneity among the variables (see Yusoff and Chin; 2000). As real exchange rate (e) and interest rate (r) appear to be the most weakly exogenous variables in the system relative to the rest of the variables, they come first in the order of real exchange (e) interest rate (e), followed by real output and real broad money. Table 5 reports the VDCs of 12-quarter forecast errors in which variance shocks to the exogenous variables are predominantly explained by their own innovations.

These results being consistent with those of the Granger-causality tests presented in Table 3, they indicate that m1 and m2 account for 14% and 26% of variation in the forecast error of y respectively. However, e contributes significant amounts of 32%, 14% and 36% of the variation in the forecast error of y, m1 and m2 respectively, Furthermore, r explains reasonable shares of 16% and 18% of the total volume of variation in the forecast error of y. While both m1 and m2 contribute insignificant shares of only 1% and 3% of variation in the forecast error of e, they account for similar amounts of 9% and 4% respectively in the variation of forecast error of r. Similarly, r explains a significant share of 29% and 4% of the variation in forecast error of m1 and m2 respectively. Nevertheless, y contributes very little in the total volume of variation in e, r, m1 and m2.

The results show that exchange rate is the leading cause of variation in the forecast error of real output (32% and 21% respectively) followed by money (14% and 26% respectively). Whereas r, m1 and m2 explain very insignificant portions in the variance decomposition of e, y, m1 and m2 contribute negligibly to the variance decompositions of r. Since the portion of e in the variance decomposition of m2 is the largest among the variables, this lends an important support to the conjecture of a strong causal effect running from e to m2 as confirmed by the Granger-causality test in Table 3.

Table 5: Variance Decompositions
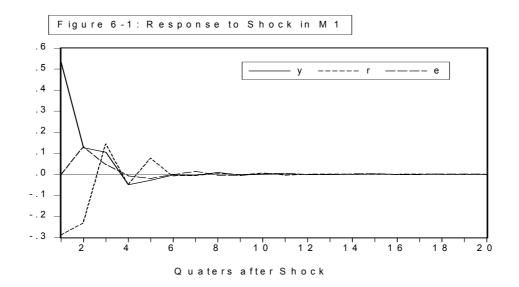
Model M1	Percentage of forecast error variance explained by shocks in:			
Effect Upon	Δe	Δr	Δy	Δm1
Δe	87.10	2.00	9.78	1.11
Δr	11.43	72.18	7.87	8.52
Δy	32.44	16.04	37.35	14.17
Δm1	13.76	29.38	4.24	52.61
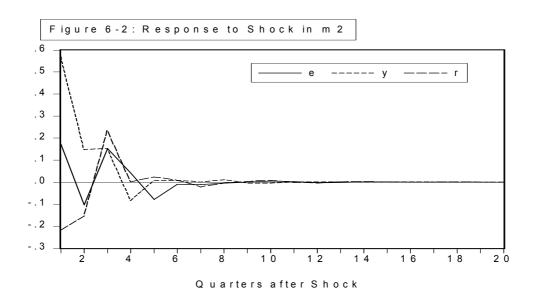
Model M2	Percentage of forecast error variance explained by shocks in:			
Effect Upon	Δe	Δr	Δy	Δm2
Δe	86.20	3.80	6.54	3.46
Δr	4.27	88.31	3.48	3.94
Δy	21.86	18.14	34.49	25.51
Δm2	35.94	2.93	1.55	59.59
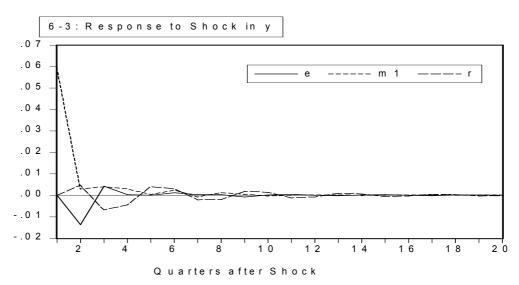
Note: This variance decomposition shows the percentage of the three-year forecast error in the variable in each row to the variable at the top of the column. Since the results based on different orderings did not differ so much, so the results of the ordering (Δe, Δr, Δy, Δm2) are those presented in the above table.
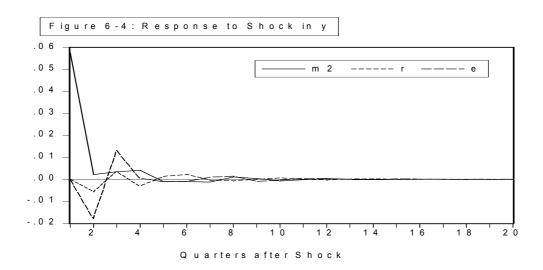
Impulse Response Functions

As the impulse response functions (IRFs) are generated from a cointegrated system, a shock in any variable is expected to exert a permanent and long-lasting effect on the system, which gradually adjusts to a new equilibrium. The impulse response functions presented in Figures 6 indicate 20-quarter response of the endogenous variables to an initial shock of one standard deviation (S.D) in m1, m2 and y. Generally, the results of IRFs are consistent with the results of the VDCs that were obtained earlier. Figures 6.1-6.4 trace out the impact effect of a one standard deviation in real narrow money (Figure 6.1), real broad money (Figure 6.2) and real output (Figure 6.3 and 6-4). Specifically, Y responds massively to a one-standard-deviation shock in m1 and M2. In both cases, a shock in narrow money or broad money leads to a rise of real output, a fall of interest rate and an exchange rate depreciation. Adjustment to monetary shock in these variables dies out after a period that ranges between six to eight quarters to revert to their equilibrium values. Similarly shock to interest rates causes tremendous fall in money demand (m1 and m2) whereas exchange rate appreciates heavily.

Figure 6-1: Response to Shock in M1

Figure 6-2: Response to Shock in m2

Quarters after Shock

6-3: Response to Shock in y

Quarters after Shock

Figure 6-4: Response to Shock in y

Quarters after Shock

CONCLUSIONS AND POLICY IMPLICATIONS

The objective of this paper is to estimate and test the stability of money demand function in Malaysia using the cointegration and error-correction techniques on a quarterly data on real money balances, real output as a scale variable, real exchange rate and interest rates on Government securities, from 1991:I to 2003:4. The cointegration tests indicate that both M1 and M2 are cointegrated with the specified independent variables. The estimated vector error-correction system supports a single cointegrating vector and a stable long-run real money demand function in Malaysia. The coefficients on all the variables carry correct signs and are significant (except the coefficient on real exchange rate). Khalid (1999) obtains the same result in his study of Philippines, Singapore and South Korea. This finding is consistent with evidence since interest rates in small economies are subject to regulation by policymakers or basically determined by external factors. In such cases, they are no longer a reasonable proxy for the actual costs of holding money, but just indicators of the restrictiveness of monetary policy.

The finding of persistent causality running from money (both narrow and broad) to output affirms the critical importance of money as an instrument for reviving economic activity in the short run. The Granger-causality implied by this result is compatible with Keynesian and Monetarist macroeconomic theoretical foundation that money is not neutral in the short run (Tan and Baharumshah, 1998). The findings indicate that M2 has the strongest causal effect on the real output (26% of variance decomposition compared to 14% of variance decomposition of M1). The VECM results find that demand for real money is also influenced positively and strongly by real exchange rate and real output, implying that an exchange rate (depreciation) and real GDP growth raise the demand for real money balances people would like to hold.

Finally, the finding of a single stable long-run money demand function has important policy implication for Malaysia in that if the central bank wants to control the total liquidity in the economy, it can do so by identifying appropriate medium-term growth targets for money supply and manipulate interest rates and reserve money. While the lack of sufficient quarter data on some of the series has been an obstacle to this study, nevertheless, these findings are consistent with a number of studies. For example, Hayo (2000) finds that while M1 money demand function was unstable, M2 money demand function displays long-run stability in Austria. Furthermore**,** Koǧar (1995) finds that M1 and M2 demand functions in Israel and Turkey are stable. Likewise Nachega (2001) finds that the demand for M2 in Cameroon is stable. As Tan and Baharumshah (1999) have found that M1 and M3 appear to have a significant effect on output and prices, a further study is needed to provide convincing evidence supporting this finding and the reason which might have prompted the Central bank to switch from M2 to M3 as a primary monetary target.

REFERENCES

Andoh, K. Samuel and David Chappell (2002), Stability of the money demand function: Evidence from Ghana, *Applied Economics Letters*, 9: 875-878.

Bruggeman, Annick, Paola Danati and Anders Warne (2003), Is Demand for Euro Area M3 Stable?, *European Central Bank Paper series*, Working Paper No.255.

Canetti, Elie and Joshua Greene (1991), Monetary Growth and Exchange Rate Depreciation as Causes of Inflation in African Countries: An Empirical Analysis, *IMF Working Paper*, WP/91/67.

Coenen, Günter and Juan-Luis Vega (1999), The Demand for M3 in the Euro Area, *European Central Bank Paper Series*, Working Paper No. 6.

De Browuer *et al* (1993), The Demand for Money in Australia: New Tests on an Old Topic. *Economic Analysis Department, Reserve Bank Australia*, Research Discussion Paper 9314.

Enders, Walter (1995), *Applied Econometric Time Series*, New York, John Wiley & Sons, INC.

Georgopoulos, George (2000), Estimating the Demand for Money in Canada: Does including an own rate of return matter? Jessay16.wpd. version 6.

Ghartey, Edward E. (1998), Monetary Dynamics in Ghana: Evidence from Cointegration, Error-correction Modeling and Exogeneity, *Journal of Development Economics,* 57: 473-486.

Goldfield, S. M. (1976), The Case of Missing Money, *Papers on Economic activity*, 3: 638-730.

Goldstein, M. and John Hawkins (1998), The Origin of the Asian Financial Turmoil, *Australian Reserve Bank, Research Discussion Paper* 9805.

Hayo, Bernd (2000), The Demand for Money in Austria, *Centre for European Integration Studies*, Working Paper B 6.

Ho, W. S. (2003), Money Demand in Macau and its Estimation, *Monetary Authority of Macau*.

Huang, J. Cliff, Chien-Fu Jeff Lin and Jen-Chi Cheng (2001), Evidence on nonlinear error correction in money demand: the case of Taiwan, *Applied Economics*, 33: 1727-1736.

Jonsson, Gunnar (2001), Inflation, Broad Money Demand, and Purchasing power Parity in South Africa, *IMF Staff Papers* 2001/482.

Kannapiran, C. A. (2001), Stability of Money Demand and Monetary Policy in Papua New Guinea (PNG): An Error-Correction Model Analysis*, International Economic Journal*, 15, 3, Autumn: 73-83.

Keynes, J. M. (1936), *General Theory of Employment, Interest Rates and Money*, London and New York: Macmillan.

Koğar, Çiğdem iZGi (1995). Cointegration Test for Money Demand: The Case for Turkey and Israel, *Research Department, the Central Bank of the Republic of Turkey*, Discussion Paper No: 9514.

Meshach, Aziakpono (2002), Money Demand Function in Lesotho: An Application of Cointegration and Error-Correction Modelling. A Paper presented in the 7th Annual Conference on Econometric Modelling for Africa, 2-5 July, 2002, at Kruger National Park, South Africa.

Nachega, Jean-Claude (2001), A Cointegration Analysis of Broad Money in Cameroon, *IMF Working Papers* WP/01/26.

Paustain et al (2001), Money Demand in Germany. Bonn Graduate School of Economics, University of Bonn, Germany.

Pinon-Farah, M. (1998), Demand for Money in Mozambique: Was there a Structural Break? *IMF Working Paper*.

Price, Simon and Anjum Nasim (1999), Modeling Inflation and the demand for Money in Pakistan, Cointegration and the Causal Structure, *Economic Modeling*, 16: 87-103.

Shen, Chung-Hua and Tai Hsin Huang (1999), Money demand and Seasonal Cointegration, *International Economic Journal*, 13, 3: 97-123.

Slok, T. (2002), Money Demand in Mongolia: A Panel Analysis, *IMF Staff Papers*, 49, 1: 128-134.

Sriram, S. S. (1999b), Demand for M2 in an Emerging-Market Economy: An Error-Correction Model for Malaysia, *IMF Staff Papers*, WP/99/173.

Sriram, S. S. (1999a), Survey of Literature on Demand for Money: Theoretical and Empirical Work with Special Reference to Error-Correction Models, *IMF Staff Papers*, May.

APPENDIX

Definitions and sources of variables

Unless otherwise indicated, the data series are drawn mainly from the IMF *International Finance Statistics (IFS),* with exception of interest rates, all the series are in natural logarithms.

p: consumer price index (2000 = 100).

e: is the logarithm of the Malaysian ringgit per US dollar exchange rate. Hence, Δe is the depreciation rate.

m: logarithm of real money (narrow and broad money).

y: logarithm of real GDP.

i: interest rate on Government securities (three-month treasury bill).

DUM: dummy taking value of one between 1991:1 and 1998:2 when the ringgit was floating and zero between 1998:3 to 2003:4 when it was pegged to the US dollar.

The Instability of the Long Run Money Demand Function: An I(2) Interpretations

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ABSTRACT

The paper attempts to provide an empirical analysis to detect the existence of long run stable money demand function in Malaysia. Using Divisia index of money, the analysis is performed within the newly developed cointegrated I(2) VAR framework proposed by Rahbek *et al*. (1999), offering some insights about the dynamic links between stock money, prices, economic activity and interest rates. The empirical findings conclude that the demand for money in Malaysia is stable.

INTRODUCTION

One of the most enduring analytical devices in macroeconomics has been the aggregate money demand function. A stable demand for money function plays an integral role in the formulation of successful monetary policy. From a monetarist point of view, the effectiveness of the monetary policy is subject to the condition that the supply of money grew in line with the demand for money – at least, the demand for money function should be stable. The existence of a well define and stable money demand function is thus a primacy for a reliable transmission of the impact of changes in the money supply to aggregate spending (Hossain and Chowdhury, 1996).

As the theoretical and empirical appeal of monetarism grew through the 1970s, most countries, including Malaysia, devoted more attention to movements in the monetary aggregates. Given that price stability was the ultimate objective of monetary policy, Malaysia has adopted the practice of announcing targets for monetary growth in order to tie down inflationary expectations.

However, subsequent development in the economy and the financial innovation and regulatory changes during the early 1990s has severely distorted the monetary outcome. This has contributed to generating doubts about the usefulness of monetary aggregates in the conduct of monetary policy. Indeed, the Bank Negara Malaysia has shifted its focus from monetary targeting to interest rates targeting.

While this decision was a matter of judgment at the time, reflecting the findings of instability in money demand function, the literature on the use of money has evolved in different ways. A first strand of the literature has looked at ways of improving money demand models, this including focusing on whether an incorrect definitions of money could be the reasons why the demand for money function had become unstable.

There has been a growing literature on the measurement issue concerns the definition of money. The way money is defined is crucial in setting the boundary of monetary policy: as Cagan (1991) put it: "the definition of money for policy purposes depend on two considerations: the ability of the authorities to control the quantity, and the empirical stability of a function describing the demand for it".

In a sequel of papers, Barnett (1980, 1987, and 1995) argued that simple sum aggregation of money, which is usually employed by central banks, can only useful as accounting identities, since they cannot approximate the service flow that money provides: they cannot approximate the economic good that one would call money. Barnett proposed the use of Divisia monetary indexes as an alternative to the simple sum aggregates: Divisia index possess some appealing properties that not only performed well relative to the desirable properties of the statistical index numbers, but also provide high quality approximations to values of the economic quantity and price aggregates of aggregation theory.

Indeed, empirical evidence of the superiority of the divisia index in Barnett et al (1984), Belongia and Chalfant (1989), Chrystal and MacDonald (1994) as well as Konstaninou (2002) give rise to the question whether the instability of the conventional standard money demand function is attributed to mis-measurement of the money and the potential 'correction' of such mis-measurement. Chrystal and MacDonald (1994) have observed the following regarding "the problems with tests of money in the economy in recent years...may be more due to bad measurement rather than instability on the link between the true money and the economy…rather than a problem associated with the Lucas Critique, it could instead be a problem stemming from the 'Barnett Critique.'" As a matter of fact, this Barnett Critique issues have been used to cast doubt upon many widely hold views in monetary economics, as recently emphasized by Barnett, Fisher, and Serletis (1992), Belongia (1993), and Chrystal and MacDonald (1994). Based upon this rapidly growing line of research, Chrystal and MacDonald (1994) conclude---in our opinion correctly---that: "Rejections of the role of money based upon flawed money measures are themselves easy to reject."

The second strand of research has turned into the investigation of the usefulness of money as an indicator for the conduct of monetary policy. There have been recent developments in the time series analysis, which seek to uncover *long-run* relationships between the money stock, economic activity and interest rates, utilizing the cointegration analysis. Accordingly, cointegration is a necessary condition for a money demand equation to be stable in the long run (Melnick, 1995; Ericsson and Sharma, 1996): although there may be short run deviations in the presumed relationship between money and income, there may be some underlying economic relationship to which two series revert over time. If money and income do in fact move together over time, and if reversion to the joint long run path is possible, then economic analysts are more likely to regard monetary aggregates as containing useful economic information.

The determinants of the long run money demand function have been the subject of a large number of studies using a variety of methods and variables selection. One difficulty often present in the empirical analysis of economic time series is the determination of the order of integratedness of a series. Theoretically, a process is either I(0) or I(1) or I(2). In practice many variables, or combination of variables are borderline case such that distinguishing between a strongly autoregressive I(0) or an I(1) process are far from easy (interest rate is a typical example) or between a strongly autoregressive I(1) or I(2) process (nominal prices are typical example). Allowing for local linear trends in the data and, even worse, in the cointegration space, increase the ambiguity more.

The usual assumption underlying the existing literature, which is also been documented by univariate non-stationary test, in most of the cases, is that nominal money and prices are better described statistically as being integrated of order two, denoted as I(2) (Johansen, 1992; Haldrup, 1994; Juselius, 1994 and Paruolo, 1996)[1]. As a remedy for reducing the order of integration while preserving cointegration relationships, guided by theoretical consideration, nominal-to-real transformations are routinely used - deflating the logarithm of nominal monetary aggregates, with the logarithm of the price index, p (i.e. imposing long run price homogeneity) in the form that real money (m_t-p_t), defined as an I(1) process, has become a common practice in the literature[2].

In the literature, there is general agreement that the demand for money balance in the long run is demand for real balance, (m_t-p_t) and is a function of a scale variable (as a measure of economic activity) such as GDP and a set of opportunity cost variables (to indicate the foregone earnings by not holding assets, which are alternative to money). This cost may be also reflected in the inflation rate. These variables, are then treated empirically as first-order integrated processes. By implication, nominal money, m_t, and the price level, p_t, are I(2), sharing a common stochastic trend and thus cointegrating to I(1).

Modeling real money and inflation, instead of money and prices, with the underlying implicit assumption is that the system has been successfully transformed from I(2) to I(1) model, forms the starting point in most empirical studies of money demand relationships in the existing literature. However, treating the validity of the transformation by assumption runs a significant risk in term of inference on number and structure of cointegrating relations. Kongsted (1999) demonstrated that, under certain condition, a nominal-to-real transformation that fails in terms of I(2)-to-I(1) cointegration can leave the transformed variables integrated of order two, and, consequently, I(1) inference and interpretation will not valid. In facts, Fiess and MacDonald (2001) pointed out that the widely noted instability of money demand functions go hand-in-hand with a nominal-to-real transformation that is unsuccessful in achieving an I(2)-to-I(1) reduction.

Using the newly developed I(2) cointegration which allow for trend stationary component proposed by Rahbek *et.al* (1999), this study focus on the money demand for Malaysia by looking at the Divisia index of money

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[1] See Haldrup (1998) for a recent survey on the econometric analysis of I(2) variables.
[2] Such a nominal-to-real transformation, rest implicitly upon the assumptions, that money and prices are both I(2), but share one common I(2) trend, and this common trend can be expressed as an I(1) relationship which conforms in vector form to (1, -1), i.e. m-p.

instead of the conventional measure of monetary aggregates. The cointegration I(2) model allows tests of cointegration between nominal variables which appear relevant to cater for I(2) component as well as for linear trend in the multivariate framework. It is generally believe that the far-reaching changes in the Malaysia's economy and the financial system have caused considerable instability of the money demand function for Malaysia. Such phenomena can appear as ongoing changes in the opportunity cost of the money holding which can be modeled as a linear trend (See Hendry and Ericsson, 1991; Dekle and Pradhan, 1999).

Beside this, the I(2) cointegration analysis can be serve as additional misspecification test for testing for I(2)ness of the I(1) model (Rahbek *et al*, 1999). If $m_t - p_t$ is CI(2,1) in the sense of Engle and Granger (1987), then inference in I(1) model using a real balances and the growth rate of one of the nominal variables is valid (see, Kongsted, 1999). But, if $m_t - p_t$ is still an I(2) variable, then by assuming a priori that m_t-p_t is an I(1) variable, this will lead to invalid inferences since I(1) model would not appropriate for the analysis. Any relation between m_t-p_t and the rest of the variables in the system would be spurious.

Accordingly, the present analysis proceeds in two stages. Firstly, to detect the number of I(2) and I(1) trends in the data, as well as the cointegration relations which include linear trend, each of the money demand function with different definition are analyzed in the I(2) cointegration space. Next, to see whether the nominal-to-real transformation has successfully transformed the system from I(2) to I(1) system while maintaining the cointegration relationship without the loss of the long run information,
An analysis of I(2) space of the real money and real aggregate demand functions are tested. The paper is organized as follows. Section 2 presents the framework of estimating the long run money demand function as well as the data utilized in the present study. Section 3 contains a brief discussion on the I(2) cointegration. Section 4 present the empirical results and sections 5 end up with conclusion.

THE LONG RUN MONEY DEMAND ESTIMATION

The standard theory of the demand for money generally distinguished three motives for holding money: the transactions motive, the precautionary motives and the speculative motive. All of these lead to a simple Keynesian-type demand for money function

$$M = f(P,Y,C)$$

Where nominal money being positively related to the price level (p) and the real income (Y) and negatively related to the opportunity cost (c) of holding money.

In equilibrium

$$Ms =Md$$

In the money demand function literature, there is overwhelming agreement that in the long run the money balances depend on a scale variable such as the real income and at least one interest rate. The former variable reflects the fact that money is used for transaction purpose and the latter represent the opportunity cost of holding money.

Empirically, in this study, the empirical analysis will be performed for a four-dimensional vector,

$$z_t^{'} = [m, y, p, i]_t, \quad t=1981:03, \dots,2003:04.$$

Where m is the divisia monetary aggregate index (further detail on the construction of the Malaysia monetary services index are provided in Habubullah, 1998), y is the income measured by real GDP; Price level measured by consumer price index, and the interest rates is the 7 day inter-bank interest rates. All variable are in logarithms with the exception of the interest rates.

ESTIMATION METHOD

Consider the general VAR model with Gaussian error in p-dimensions

$$z_t = \eta + \sum_{i=1}^{p} \Pi z_{t-i} + \varepsilon_t \tag{1}$$

where η is a (nx1) vector of deterministic variables, and ε is a (n x 1) vector of white noise disturbances and mean zero. The purpose of the cointegration analysis is to distinguish between stationary by linear combinations and by differencing. Therefore, the model can be reformulated into the vector error correction (VECM) as,

$$\Delta z_t = \eta + \sum \Gamma_i \Delta z_{t-i} - \Pi z_{t-i} + \varepsilon_t \tag{2}$$

where Δ denotes the first difference operator, Γ_i is a (n x n) coefficient matrix (equal to $-\sum_{j=i+1}^{p} \Pi_j$), Π is a (n x n) matrix (equal to $-\sum_{j=i+1}^{p} \Pi_j - I$), whose rank determines the number of cointegrating vectors.

The hypothesis of cointegration is formulated as a reduced rank of the Π matrix

$$H_1(r) : \Pi = \alpha\beta'$$

where α and β are p x r matrices of full rank.

I(1) cointegration occurs when Π is of reduced rank, $r < p$ in the reduced rank case, Π can be factorized into Π (= $\alpha\beta'$) where α and β are p x r matrices and α denotes the adjustment coefficients and β is the cointegrating vectors. The cointegrating vector β have the property that $\beta'z_t$ is stationary, even though that z_t itself is not stationary. Thus, within the I(1) framework , the hypothesis of I(1) cointegration is formulated as the reduced rank $\Pi = \alpha\beta'$ and the full rank of $\alpha\perp'\Gamma\beta\perp$ and $\alpha\perp$ and $\beta\perp$ are p x (p − r) matrices orthogonal to α and β. Therefore, it can be distinguish between r cointegrating I(0) relation and p-r non-cointegrating I(1) relations.

The I(2) model which allows the p-dimensional vector of time series, z_t, to be linearly trending and have some or all the components integrated of order two may be understood by referring to equation (3):

$$\Delta^2 z_t = \eta - \Pi z_{t-1} - \Gamma \Delta z_{t-1} + \sum_{i=1}^{p-2} \phi_i \Delta^2 z_{t-i} + \varepsilon_t \tag{3}$$

where $\quad \Gamma = I - \sum_{i=1}^{p-1} \Gamma_i$ and $\phi_i = -\sum_{j=i+1}^{p-2} \Gamma_i$, I = 1,…, p-2.

The I(2)framework relax the assumption that $\alpha\perp'\Gamma\beta\perp$ is a full rank and postulates that not only must $\alpha'\beta$ be of reduced rank, but also $\alpha\perp'\Gamma\beta\perp$, which now becomes (p-r) x (p-r) and is of reduced rank s1. $\alpha\perp'\Gamma\beta\perp$ therefore can be expressed as $\alpha\perp'\Gamma\beta\perp = \xi\eta'$, where ξ and η are matrices of order (p x r) x s_1 with $s_1 < $ p-r.

The hypothesis H1(r) implies that the process Δz_t is stationary, z_t is nonstationary, but $\beta'z_t$ is stationary (see Johansen, 1991). Thus, the relations $\beta'z_t$ can be interpreted as stationary relations among nonstationary variables.

EMPIRICAL RESULTS

A visual plot of the data is usually the first step in the analysis of any time series data. Figure 1 highlights a number of features of the data. The nominal variables, namely the divisia money and the price level, are clearly nonstationary. In similar pattern the real GDP showing upward trend pattern. The interest rate does not appear stationary but it seems to have no significant deterministic trend.
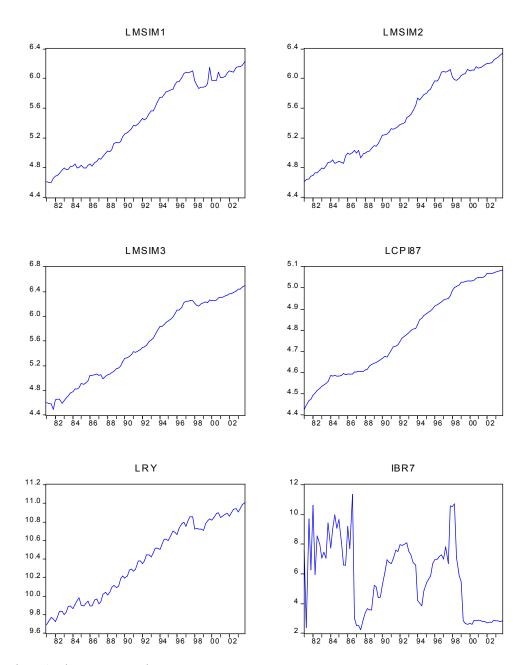
Figure 1: The Data In Levels

Juselius (1996) argued that there exist ample empirical evidence that both the measures of prices level and nominal money stocks are best described as I(2) integrated variables. Not surprisingly, the empirical results of the augmented Dickey-Fuller unit root test reported in Table 1 provide some initial evidence in favor of such assumption. The remaining series, namely, real GDP and the interest rates, are at most integrated at order one.

Table 1: Univariate Unit Root Tests

	Level	First difference	Second Difference
	Constant with Trend	Constant without Trend	Constant without Trend
LMSIM1	-1.9217 (9)	-2.4764 (8)	-6.1180 (7)***
LMSIM2	-2.7561 (12)	-1.8780 (11)	-5.1226 (10)***
LMSIM3	-1.6146 (8)	-2.3875 (12)	-3.2206 (11)**
LRGDP	-1.9344 (4)	-3.3593 (3)**	-10.4452 (2)***
LCPI	-1.5213 (5)	-4.3123 (4)***	-5.2132 (10)***
IBR7	-3.1092 (2)	-17.1147 (0)***	-7.2346 (4)***

Note: MSIM1, MSIM2 and MISM2 denotes, divisia money M1, M2 and M3, RGDP stands for real GDP, CPI and IBR7 refer to consumer price index and 7 days interbank rate, respectively. All variable are in logarithms with the exception of the interest rates.

To proceed with the Rahbek *et al* (1998) I(2) cointegration analysis, the first step is to determined the lag length, k, of the VAR model. Using general-to-specific reduction of the VAR model, the AIC and the reduction process indicated that a lag order of 5 was adequate for the models in the present study. The results for the I(2) analysis on the money demand model with difference measures of monetary services index are presented in Table 2 to 4.

Table 2: An I(2) Analysis of [LMSIM1, LCPI, LRGDP, IBR7] 1982:03 to 2003:04 VAR (5)

p-r	r	$Q(s_1,r)$				$Q(R)$
4	0	173.82	127.12	97.18	82.78	75.15
		(132.02)	(107.91)	(87.90)	(71.33)	(59.02)
		136.98	113.04	92.24	75.30	62.76
3	1		106.18	62.82	38.89	32.08
			(82.29)	(64.23)	(49.69)	(39.26)
			86.66	68.23	53.19	42.66
2	2			53.17	29.41	17.79
				(44.52)	(31.61)	(22.98)
				47.60	34.36	25.43
1	3				15.11	6.40
					(17.57)	(10.63)
					19.87	12.49
p-r-s		4	3	2	1	0

Note: Numbers in parenthesis (Italic) are 90 (95%) quantiles from table 8 in Jorgensen, Kongsted and Rahbek (1999)

For inference on the cointegration ranks, the test statistics $S_{r,s}$ are compared to the 95 percent quartiles of the asymptotic distribution. To begin with, the I(2) analysis of the money demand function for nominal divisia money M1(LMSIM1), the price level (LCPI), real GDP (RGDP) and short tem interbank rate (IBR7) is performed and reported in Table 2. Reading from the top left corner, moving towards the right to the end of the first row, the most restricted model ($r = 0$, $s_1 = 0$, $s_2 = 4$) can be safely rejected. In all, the test statistics firmly reject $r = 0$. The first non-rejection case will be the hypothesis of one polynomial cointegrating relationship ($r = 1$) with one I(1) trend ($s_1 = 2$) and two ($s_2 = p – r - s_1 = 2$) I(2) trends in the system. From the results of Johansen (1992b) and Haldrup (1994), the natural candidates for I(2) variables are most likely be m_t and p_t. The likelihood ratio test for no linear trend in the polynomial cointegrating relationship yields a test statistics of 15.89 with p-values of 0.000. Thus, there is clearly a role for linear trend in the multi-cointegrating relations.

Table 3: An I(2) Analysis of [LMSIM2, LCPI, LRGDP, IBR7] 1982:03 TO 2003:04 VAR (5)

p-r	r	$Q(s_1,r)$				Q_r
4	0	184.52	139.59	121.30	107.24	100.46
		(132.02)	(107.91)	(87.90)	(71.33)	(59.02)
		136.98	113.04	92.24	75.30	62.76
3	1		98.20	63.21	46.60	42.53
			(82.29)	(64.23)	(49.69)	(39.26)
			86.66	68.23	53.19	42.66
2	2			46.60	28.74	21.31
				(44.52)	(31.61)	(22.98)
				47.60	34.36	25.43
1	3				14.88	6.06
					(17.57)	(10.63)
					19.87	12.49
p-r-s		4	3	2	1	0

Table 4: An I(2) Analysis of [LMSIM3, LCPI87, LRGDP87, IBR7] 1982:03 TO 2003:04 VAR (5)

p-r	r	$Q(s_1,r)$				Q(R)
4	0	196.54	141.53	126.18	112.70	105.92
		(132.02)	(107.91)	(87.90)	(71.33)	(59.02)
		136.98	113.04	92.24	75.30	62.76
3	1		103.03	52.40	38.96	34.19
			(82.29)	(64.23)	(49.69)	(39.26)
			86.66	68.23	53.19	42.66
2	2			39.42	24.09	15.09
				(44.52)	(31.61)	(22.98)
				47.60	34.36	25.43
1	3				15.26	5.02
					(17.57)	(10.63)
					19.87	12.49
p-r-s		4	3	2	1	0

Akin to the case of MSIM1, similar conclusion can be drawn for the money demand model with LMSIM2 and LMSIM3. As reported in Table 3, applying the rank test procedure of Rahbek *et al.* (1999) on the vector of [msim2, cpi, rgdp, r] suggested that the models having r = 0 can be firmly rejected. A non-rejection occurs for the case (r,s) = (1,2). This suggests that the model comprises 2 common I(1) and two common I(2) stochastic trends with the existence of one cointegrating vector. The likelihood ratio test of 25.95[0.000] indicated that the linear trend the cointegration space is significant.

With respect to the LMSIM3 model, it can be observed that the hypothesis of no cointegration (r =0) can be rejected. The testing procedure stops, when the test statistics $S_{r,s}$ of 52.40 reveal that the hypothesis of (r,s) =(1,2) cannot be rejected. The likelihood ratio test of no linear trend of 14.03 [p-value=0.000], suggesting the presence of the deterministic trend in the polynomials cointegration relationship.

Since the I(1) model are still more developed compared to the I(2) model, we are interest in whether deflating the logarithm of nominal money by the logarithm of the price index, or, in other word, by imposing price homogeneity, represent a nominal-to-real transformation that result in a successful I(2)-to-I(1) model without the loss of generality. When modeling real money and inflation, instead of nominal money and price, the implicit assumption is that, according to Fiess and MacDonald (2001)

'…(1) that money and prices are both I(2), but share one common I(2) trend
  (2) that this common I(2) trend can be expressed as an I(1) relationship which conforms in vector form to (1, -1), i.e. m-p…'

In such as case, imposing price homogeneity with a successful I(2)-to-I(1) model, one should arrive with the similar conclusions with using an I(2) cointegration analysis. By pre-imposing real money, (m-p), if it does not remove all I(2) component s from the system, then moving to an I(1) model could lead to questionable statistical inference. To ensured that all I(2) components have been removed from the transformed system, an I(2) test are performed on the vector [(m-p), Δp, yr, r], reported in Table 5 - 7.

Table 5: An I(2) Analysis of [LMSIM1-LCPI, ΔLCPI, LRGDP, IBR7] 1982:03 TO 2003:04 VAR (5)

p-r	r	$Q(s_1,r)$				Q(R)
4	0	200.74	142.24	104.04	84.36	74.09
		(132.02)	(107.91)	(87.90)	(71.33)	(59.02)
		136.98	113.04	92.24	75.30	62.76
3	1		109.83	70.21	47.79	35.00
			(82.29)	(64.23)	(49.69)	(39.26)
			86.66	68.23	53.19	42.66
2	2			58.31	29.04	17.71
				(44.52)	(31.61)	(22.98)
				47.60	34.36	25.43
1	3				16.98	5.26
					(17.57)	(10.63)
					19.87	12.49
p-r-s		4	3	2	1	0

The joint rank statistics, S $_{r,s}$, 47.79, pointing to one I(2) trend and one cointegrating relationship exists in the vector of [LMSIM1-LCPI, ΔLCPI, LRGDP, IBR7] reported in Table 5. Evidence of I(2)'ness in the system would suggest a failure in achieving an I(2)-to-I(1) cointegration in such a case.

Table 6: An I(2) Analysis of [LMSIM2-LCPI, ΔLCPI, LRGDP, IBR7] 1982:03 to 2003:04 VAR (5)

p-r	r	Q(s₁,r)				Q(R)
4	0	210.33	159.52	126.02	108.29	97.42
		(132.02)	(107.91)	(87.90)	(71.33)	(59.02)
		136.98	113.04	92.24	75.30	62.76
3	1		120.25	77.14	55.61	40.91
			(82.29)	(64.23)	(49.69)	(39.26)
			86.66	68.23	53.19	42.66
2	2			50.65	28.61	16.98
				(44.52)	(31.61)	(22.98)
				47.60	34.36	25.43
1	3				16.02	4.97
					(17.57)	(10.63)
					19.87	12.49
p-r-s		4	3	2	1	0

With respect to the case of (LMSIM2-LCPI), the joint test statistics is not rejected for the first time for r = 1, s₁ = 3, s₂ = 0, indicating one cointegration vector with no I(2) components remaining in the system.

Table 7: An I(2) Analysis of [LMSIM3, ΔLCPI, LRGDP, IBR7] 1982:03 to 2003:04 VAR (5)

p-r	r	Q(s₁,r)				Q(R)
4	0	203.34	142.15	107.60	93.28	83.38
		(132.02)	(107.91)	(87.90)	(71.33)	(59.02)
		136.98	113.04	92.24	75.30	62.76
3	1		109.11	58.92	42.54	30.37
			(82.29)	(64.23)	(49.69)	(39.26)
			86.66	68.23	53.19	42.66
2	2			48.09	27.19	15.13
				(44.52)	(31.61)	(22.98)
				47.60	34.36	25.43
1	3				15.99	4.20
					(17.57)	(10.63)
					19.87	12.49
p-r-s		4	3	2	1	0

As presented in Table 7, pre-imposing price homogeneity does not remove the I(2) components in the (LMISM3-LCPI) money demand function. An I(2) analysis of RMSIM3, inflation, real GDP and interest rates revels that there exist 2 I(2) trend, one I(1) trend with one cointegrating relationship.

AN I(1) ANALYSIS OF (LMSIM2 - LCPI) DEMAND FUNCTION

Since pre-imposing the price homogeneity remove all the I(2)'ness in the (LMSIM2 – LCPI) money demand function, the standard I(1) cointegration analysis is performed on [LMSIM2-LCPI, ΔLCPI, LRGDP, IBR7]]. To attain a model with the appropriate lag length, the cointegration test is repeated by sequentially reducing one lag at a time (beginning with a maximum of 7 orders VAR) until the length reaches one. The top panel of the Table 8 reports the Schwarz (SC) and Hanna-Quinn (HQ) information criteria for the selection of lag-length (k) and various diagnostic statistics on the system residuals: Lagrange–Multiplier tests for first-(LM(1)), fourth-(LM4)),the normality test of normality which based on a multivariate version of the univariate Shenton-Bowman test.

Statistically, the VAR(5) appears reasonably well specified over the estimation sample, although some normality is reveled by the normality test of normality which based on a multivariate version of the univariate Shenton-Bowman test. Excess kurtosis in the residuals of the equations for short tem rate, due to the presence of some outliers at the beginning of the estimation period, appears primary responsible for this finding.

Table 8: Summary Of Results From The Application Of The Johansen Procedure

Information criteria	SC	HQ	
K=1	-22.3951	-22.7929	
K=2	-22.2735	-22.9412	
K=3	-22.3744	-22.3157	
K=4	-22.2220	-23.4410	
K=5	-22.3904	-23.8910	
K=6	-21.8408	-23.6273	
Test diagnostics (k=5)	LM(1)	LM(4)	Normality
Multivariate statistics	18.017	17.937	30.024
	[0.32]	[0.33]	[0.000]***
Univariate statistics	Kurtosis	ARCH(5)	Normality
LMSIM2-LCPI	4.2365	8.529	8.438
DLCPI	3.5216	6.767	0.865
LRGDP	3.6872	6.654	1.356
IBR7	5.5970	8.459	32.802

Note: LM(1) and LM(4) denotes LM test for vector (series) first and fourth-order autocorrelation and the test of normality is based on a multivariate version of the univariate Shenton-Bowman (1977) test. For univariate statistics, ARCH is Engle' test against conditional heteroskedaticity of order 6 in the residuals, and normality refer to the modified version of the Shenton-Bowman test for normality of the individual residual series (see Doornik and Hansen, 1994)

Table 9 shows the results for the maximum and the trace test. The trace statistic rejects the null hypothesis of no cointegration in favour of at least one cointegrating relationship while the maximum eigenvalue suggest that cointegration rank is equal to two. As this remains the case, given that the trace statistics is more robust to the non-normality problem encountered in the data, the cointegrating rank is set equal one[3].

Table 9: An I(1) Analysis of [LMSIM2-LCPI, ΔLCPI, LRGDP, IBR7] 1982:03 to 2003:04 VAR (5)

Eigenv.	H0: r	p-r	L-max	L-max 95	Trace	Trace 95
0.4816	0	4	56.51*	20.41	97.42*	62.61
0.2429	1	3	23.93*	16.73	40.91	42.20
0.1304	2	2	12.01	13.08	16.98	25.47
0.0561	3	1	4.97	12.39	4.97	12.39

Table 10: Stationarity, Exclusion and Weak-Exogeneity Tests [LMSIM2-LCPI, ΔLCPI, LRGDP, IBR7]

TEST FOR STATIONARITY: LR TEST χ^2(p-r)

r	DGF	$\chi^2_{0.5}$	LMSIM2-LCPI	DLCPI	LRGDP87	IBR
1	4	9.49	55.79	41.15	55.70	50.49
2	3	7.81	23.55	16.36	23.76	18.14
3	2	5.99	11.88	6.84	11.91	8.49

TEST FOR LONG RUN EXCLUSION: LR TEST χ^2(r)

r	DGF	$\chi^2_{0.5}$	LMSIM2-LCPI	DLCPI	LRGDP87	IBR	TREND
1	1	3.84	15.90	22.71	25.40	3.00	24.47
2	2	5.99	21.51	34.63	37.10	10.94	30.35
3	3	7.81	28.54	39.50	42.11	17.94	35.38

TEST FOR WEAK-EXOGENEITY: LR TEST χ^2 (r)

r	DGF	$\chi^2_{0.5}$	LMSIM2-LCPI	DLCPI	LRGDP87	IBR
1	1	3.84	2.02	5.01	14.31	2.77
2	2	5.99	9.28	7.46	26.16	6.15
3	3	7.81	16.27	8.65	29.31	12.46

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[3] See Cheung and Lai (1993).

Table 10 reports the tests for long run exclusion, stationarity and weakly exogeneity of each variable. Conditional on the choice of cointegrating rank r = 1, none of the variables can be considered stationary.[4] The remaining test on the systems indicates that this is not the final representation. In particular, the exclusion test shows that the short term rate can be excluded from the long run relationship and the weakly exogeneity test indicated that (LMSIM2-LCPI) and IBR are weakly exogenous. This suggest that the rmsim2 might be preferable as a monetary target as it seems to be weakly exogenous for the long run parameter (Juselius and Hargreaves,1992).

CONCLUSION

The paper attempts to provide an empirical analysis to detect the existence of long run stable money demand function in Malaysia. Using Divisia index of money, the analysis is performed within the newly developed cointegrated I(2) VAR framework proposed by Rahbek *et al*. (1999), offering some insights about the dynamic links between money, prices, economic activity and interest rates. The empirical findings show that there is at least one I(2) trend in the systems of variables employed. In such a case, the resulting I(2) cointegration model reveal that cointegration relationships holds in the model of nominal divisia M1, M2 and M3.

Since the I(2) model is not as developed as the I(1) cointegration test, we are interested in whether data transformation allow one to move to the I(1) model without the loss of generality. In other words, whether a nominal-to-real-transformation success in terms of I(2)-to-I(1) cointegration can leave the transformed variables integrated of order one (i.e. by removing all the I(2)ness in the system), and consequently, I(1) inference and interpretation will be valid.

The empirical results further demonstrated that I(1) inference and interpretation of real transformed system need not to be valid even though the system is transformed according to the theoretical considerations that are satisfied by the polynomial cointegration relationships. In particular, while imposing long run price homogeneity does not remove the I(2) components in a model of divisia money M1 and M3 demand functions, the nominal-to-real transformation model does performed well for the case of divisia money demand M2.

REFERENCES

Barnett, Wiliam A. (1980) Economic Monetary Aggregates: an Application of Index Number and Aggregation Theory. *Journal of Econometrics*, 14, 11- 48.

Barnett, Wiliam A. (1987). The Microeconomic Theory of Monetary Aggregation, in Barnett, W.A. and Singleton, K.J. (eds). *New Approaches to Monetary Economics*. 115-168

Barnett, Wiliam A. (1995). Exact Aggregation Under Risk. In Barnett W.A., Moulin H., Salles M., and Schofield N.J. (eds.) (1995). *Social Choice, Welfare, and Ethics*, Cambridge: Cambridge University Press. 353 –374.

Belongia, Michael and Chalfant, James A. (1989). The Changing Empirical Definition of Money: Some Estimates from a Model of the Demand of Money Substitutes. *Journal of Political Economy*, 97(2): 389-97.

Cagan, P. (1956). The monetary dynamics of hyper-inflation. In *Studies in the Quantity Theory of Money* (Edited by Milton Friedman). University of Chicago Press, Chicago, Ill.

Cheung, Y and K.S. Lai (1993). Finite-Sample Sizes of Johansnen's Likelihood Ratio Test for Cointegration. *Oxford Bulletin of Economics and Statistics*, 55, 313-328.

Crystal, Alec K. and MacDonal, Ronald (1994). Empirical Evidence on the Recent Behavior and the Usefulness of Simple-Sum and Weighted Measures of Money Stock. Federal Reserve Bank of St.Louis *Review*, March / April: 73-109.

Dekle, R., and Mahmood Pradhan. (1999). Financial liberalization and Money demand in the Asean Countries. *International Journal of Finance and Economics*. 4: 205 –215.

Ericsson, N. and Sharma, S. (1996). Broad Money Demand and Financial Liberalization in Greece. IMF Working Paper 96/62.Washington: International Monetary Fund.

Fiess,N. and MacDonald, R (2001). The instability of the money demand function: an I(2) interpretation. *Oxford Bulletin of Economics and Sttaistics*.63 (4). 475-495.

Haldrup,N. (1998)..An econometrics Analysis of I(2) Variables. *Journal of Economic Survey*. 12, 595 –650.

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[4] The stationarity test formulated by Johansen and Juselius (1992) can be used to test whether each of the individual variables in the model are stationary by themselves for differing value r. This is particular type of unit root test using a multivariate form of the augmented Dickey-Fuller test with the null hypothesis of stationary rather than the usual non-stationary null.

Hendry,D.F. and N.R. Ericsson (1991). Modeling the demand for narrow money in the United Kingdom and the United States. *European Economic Review*. 35, 833-881.

Hussain, A. and Chowdhury, A. (1996). *Monetary and Financial Policies in Developing Countries*. London: Routledge.

Johansen,S. (1992). A representation of Vector Autorregressive Processes Integrated of Order 2. *Econometric Theory*, 8,188-202.

Juselius, K (1994). On the duality between long run relations and common trends in the I(1) versus I(2) model. An application to aggregate money holdings. *Econometrics Review*. 13, 151 –178.

Konstantinou, Panagiotis T. (2002). The Problem of Measurement: An Analysis of Money Demand Price Homogeneity in the Long Run. European University Institute. Working Paper no 2002/14.

Melnick, R., (1995) Financial Services, Cointegration, and the demand for money for Israel. *Journal of Money, Credit and Banking*, 27,321 -50.

Michael T. Belongia,(1993). Dimensions of Monetary Policy: Essays in Honor of Anatol B. Balbach, special issue of the Federal Reserve Bank of St. Louis Review, March/April 1993

Paruolo, P. (1996). On the Determination of Integration Indices in I(2) Systems. *Journal of Econometrics*, 72,313-356.

Rahbek, A., Kongsted, H.C. and Jorgensen, C. (1999). Trend Stationary in the I(2) Cointegration Model. *Journal of Econometrics*,90, 265-289.

The Us and Japanese Interest Rates Volatility and Money Demand in Malaysia

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ABSTRACT

The US and Japan are the two major trading countries for Malaysia. In this paper we examine the effect of the US and Japanese interest rates uncertainty on the money demand in Malaysia. The conditional variance estimated from GARCH(1,1) model in the study represents the US and Japanese interest rates volatility. On the basis of the Johansen multivariate cointegration test we investigate the long-run relationship between real money demand in Malaysia and the volatility of the US interest rate, and between real money demand in Malaysia and the volatility of the Japanese interest rate. We observe that the US and Japanese interest rates do have significant influence in determining the demand for money in Malaysia. Nevertheless, the opportunity cost of holding money remains to impose larger effect on the money demand function.

INTRODUCTION AND LITERATURE REVIEW

This paper presents an empirical analysis of the effect of the US and Japanese interest rates volatility on the stability of money demand in Malaysia. A major behavioral relationship in monetary theory and policy is the demand for money. The money demand function has been subjected to extensive theoretical and empirical research because of its crucial importance as a fundamental building block in macroeconomic theory and as a critical component in the formulation of monetary policy. The effectiveness of monetary policy depends on the stability of the money demand equation as such changes in the money supply will have predictable impacts on real variables. The evolution in the financial system as a result of technological changes and financial innovations are believed to be the factors attributed to the instability of the demand for money (Ford, Peng, and Mullineux (1992), Ford and Mullineux (1996)).

The current empirical research on the effect of interest rate volatility on the money demand function is rather limited and presently only confined to U.S. data. Given the fact that there may be important effects on monetary policy caused by interest rate volatility, research in this area is rather important.

In his study on intertemporal paths for household's consumption and portfolio allocation of wealth, Marquis (1989) concludes that the volatility of the interest rate could alter the optimality of the household's consumption and portfolio decision. Consequently, changes in the portfolio holding will have an affect on household's demand for money. However, in a stochastic environment these shocks are quickly offset by the subsequent shocks that attenuate the household's consumption and portfolio allocation response. On the effect of interest rate volatility on the partial equilibrium household demand for money, Marquis (1989) demonstrates that the volatility of the short-term interest rate does not necessarily imply an increase in money demand. Greater short-term or long-term interest volatility according to him has an ambiguous net effect on the household's quantity of money demanded due to cross-correlations of interest rates with each other and between interest rates and inflation rates. Garner (1990) argues that the economic experience in the U.S. in the early 1980's is difficult to interpret because of unusual circumstances that could obscure an interest rate volatility effect. He added that deposit deregulation and technological change may have altered permanently the behavior of money demand, and relative volatility measures may not represent accurately all movements of interest rate and inflation rate uncertainty. Thus, an empirical study on interest rate volatility in the U.S. using a sample period of 1959-1984 provides little evidence to support the hypothesis that interest rate volatility raises demand for money. However, he found interest rate variability to have a negative impact upon money demand over the period 1959 to 1973 which he argues might be due to inflation uncertainty dominating the relatively constant real interest rate. Garner (1990) concludes that interest rate volatility may affect real economic variables through such channels as bond risk premiums and direct effects on business investment spending. As such, a significant presence of interest rate volatility in the money demand function could have important effects on economic performance and monetary policy.

Subsequently, Arize and Darrat (1994) in their empirical study used U.S. quarterly data of 1963Q1-1991Q4 and included money-growth volatility and interest rate volatility as additional regressors in the U.S. M2 demand equation. Their study shows that there is little evidence that interest rate variability has significant influence on

M2 demand for the U.S. Payne (1995) applies a Granger-causality framework to investigate the effect of the variability of the interest rate on the velocity of money. He finds evidence that variability in the short-term interest rate and in some cases the long-term interest rate affects velocity. He concludes that the variability of interest rate measures Granger-cause velocity.

Choudhry (1999) explains that volatility in the nominal interest rate is due to the volatility in the real interest rate or in the expected rate of inflation. This explanation coincides with the suggestion by Garner (1990) that much of the actual nominal interest rate volatility may be due to inflation rate volatility which reflects the inverse relationship between money demand and interest rate volatility. Choudhry (1999) indicates that both interest rate and inflation rate volatility play a significant role in the M1 demand function in the U.S., although the size and direction of the effect is not identical in every relationship. He concludes that interest rate volatility imposes a significant effect on real M1 demand if the long-term interest rate is included in the money demand function. Furthermore, in an increasingly interdependent global economy among countries, monetary developments in one country could affect both the supply and demand for money in other countries. One implication of the increased interdependence is that the aggregate demand for money in a country could be sensitive to foreign monetary developments, such as a change in foreign interest rates (Bahmani-Oskooee, 1991). A monetary policy which is formulated to counteract foreign monetary and financial developments will require knowledge of the sensitivity of the money supply to those events as well as knowledge of the response to the demand for money.

The literature on money demand is quite abundant but there are not many studies that link the US and Japanese interest rates volatility on the stability of money demand for developing countries. Note that U.S. and Japan are the two major trading partners of many emerging economies including Malaysia. Increasing globalization of the financial system and interdependent of global economy among countries today may have significant implication towards formulating the effective monetary policy in Malaysia. Thus, it is imperative to understand how this external factors particularly the volatility of the US and Japanese interest rates, the two major trading partners for Malaysia, could influence the money demand function of this country. This study is important in its contribution to a better understanding on the effect of foreign interest rates volatility in money demand function particularly for a small open economy such as Malaysia.

The remainder of this paper is organized as follows. Section II discusses on the model to be estimated and methodological issues on volatility of the interest rates. Data used in this study also discussed in section II. The theoretical framework that underpins the empirical analysis and the discussion on the results of the analysis are presented in Section III. Finally, Section IV presents a brief summary of the major results and conclusions.

DATA AND METHODOLOGY

The empirical work outlined in subsequent sections employs quarterly data. Series used in this study are the M1, M2, quasi money, consumption, base lending rate, interest rates (such as fixed deposits rates, savings rates, lending rates, money market rates, treasury bills rates, and rates for government securities) and consumer price index. These data are extracted from various issues of *Bank Negara Quarterly Statistical Bulletin*. In addtion, the US 3-month treasury bill rate and Japan callmoney are obtained from *International Financial Statistics* of the International Monetary Fund database CD-ROM. Other data series such as claims on the banking sector, claims on government, net foreign assets, claims of the monetary authorities and the banking sector on the private sector are also obtained from *International Financial Statistics* of the International Monetary Fund database CD-ROM. The period of the data for this study is 1976Q1 to 2001Q4.

Model

For the purpose of this study, the estimated model is based on the general functional form for the money demand function which is specified as follows:

$$M / P = \alpha y^{\beta} R^{\theta} \qquad (1)$$

Taking logarithms:

$$\ln(M / P)_t = \ln \alpha + \beta \ln(Y / P)_t + \theta \ln R_t + u_t \qquad (2)$$

where *M* is the quantity of money balances i.e. *M2*, *P* is the general price level, *Y* is income, *R* is the nominal interest rate, *α, β, θ* are parameters, *t* is the time period, and *u* is a random error term. In this study, the financial

wealth is also included in the model. This variable is considered relevant because with the development of the financial sector in Malaysia more financial products are made available to the public as alternative to money. Fase and Winder (1996a) point out that the role of wealth is unarticulated and almost ignored in empirical research on money demand. Since then, the inclusion of income or wealth or both in the money demand function has remained an issue. Following Fase and Winder (1996b) the net financial wealth of the non-monetary private sector is used as the relevant wealth variable. This is defined as the difference between total assets -the sum of M1, quasi money, claims on the banking sector and on the government and net foreign assets - and the claims of the monetary authorities and the banking sector on the private sector. The estimated final model is determined as follows:

$$\ln(M/P)_t = \ln\alpha + \beta_1\ln(C/P)_t + \beta_2\ln R_t + \beta_3\ln(FW/P)_t + \beta\ln V_t + u_t \tag{3}$$

where C represents the scale variable. The real consumption is used instead of income as the scale variable. FW is the financial wealth, and V is the variability of the US and Japanese interest rates. Finally, R is the opportunity cost of holding money that is the user cost[1]. This user cost is derived by Barnett (1978) and given as:

$$R_{it} = P_t\frac{(r_t^b - r_{it})}{(1 + r_t^b)} \tag{4}$$

where

R_{it} represents the user cost of asset i at time t,
P_t represents the consumer price index,
r_t^b represents the benchmark rate,
r_{it} represents the rate of return from the ith monetary asset at time t.

In this study i is the Malaysian 3-month treasury bill rate. In theory, the benchmark rate of return, r_t^b is defined as the maximum expected holding period yield of a pure store-of-value asset. The benchmark asset is specifically assumed to provide no liquidity or other monetary services and is held solely to transfer wealth intertemporally. The predominant approach to measuring the benchmark rate is to view r_t^b as the maximum-available holding-period yield at each point in time. In this context, it is possible that different assets will occupy the role of the benchmark asset at different moments in time (Belongia, 2000). An arbitrary constant is added to r_t^b so that user costs are always positive. According to Mullineux (1996), the pragmatic solution to the benchmark problem is usually to include a (medium to long-term) local authority or government bond rate set along with the own rates of the monetary component assets and then to form the benchmark series by taking the highest rate in the set period by period. This will ensure that $R_i \geq 0$. A constant is added to avoid zero weight in the highest-yielding monetary component in a particular period.

In the case of Malaysia, where data on corporate bonds is not readily available the other viable alternative assets i.e. the treasury bills and the government securities are included to compute benchmark rate[2]. Thus, the maximum among own rates at each point in time is chosen as the benchmark rate, i.e.

$$R_t = \max\{RDD_t, RSVD_t, RFXD_t, RNCD_t RREPOS_t, YGS_{it}\} \tag{5}$$

where RDD is the own rate of return on demand deposits, RSVD is the own rate of return on savings deposits, RFXD is the own rate of return on fixed deposits, RNCD is the own rate of return on negotiable certificates of deposit, and RREPOS is the own rate of return on repurchase agreements, and YGS represents the return on the treasury bills and yield on government securities.

Interest rate volatility

The volatility of the interest rate in this study is represented as the conditional variance of *GARCH (p,q)* model. For modeling changing volatility under deviations from linearity, Engle (1982) introduced the autoregressive conditional heteroskedasticity or *ARCH* models. Following Enders (1995), the model is expressed as follows:

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[1] Usercost is also referred to as rental prices of the monetary assets. It is the price of the transaction service of each monetary asset. See Dahalan (2003) for the detail discussion.
[2] The benchmark rate of return is defined as the maximum expected holding period yield of pure store-of-value asset. The benchmark asset is specifically assumed to provide no liquidity or other monetary service and held solely to transfer wealth intertemporally. See Dahalan (2003) for a detail discussion.

$$v_t = a_0 + a_1 v_{t-1} + \varepsilon_t \tag{6}$$

where v_t in this study is $log(i_t/i_{t-1})$, and i_t is the opportunity cost.

Accordingly, the conditional variance can be modeled by estimating an *AR(p)* process using the squared residuals:

$$\hat{\varepsilon}_t^2 = \alpha_0 + \alpha_1 \hat{\varepsilon}_{t-1}^2 + \alpha_2 \hat{\varepsilon}_{t-2}^2 + \ldots + \alpha_p \hat{\varepsilon}_{t-p}^2 + \mu_t \tag{7}$$

where μ_t is a white noise such that $\{ \mu_t \}$: iid $N(0,\sigma^2)$. In the *ARCH* model, the error structure is such that the conditional and unconditional means of ε_t are equal to zero.

As a way to model persistent movements in volatility, Bollerslev (1986) suggested the Generalized Autoregressive Conditionally Heteroskedastic, or *GARCH* model that allows the conditional variance to be an *ARMA* process. The error process is given here as:

$$\varepsilon_t = \mu_t \sqrt{h_t} \tag{8}$$

and

$$h_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-i}^2 + \sum_{i=1}^{q} \beta_i h_{t-i} \tag{9}$$

where μ_t is a white noise process such that $\{\mu_t\}$: iid $N(0,1)$ so $\sigma_\mu^2 = 1$. By analogy with *ARMA* models, this is called a *GARCH(p,q)* model.

The volatility of the US and Japanese interest rates is measured using a *GARCH* model (Choudhry, 1999). The first difference of the interest rate, v_t, can be represented in the *GARCH(p,q)* model as:

$$v_t = \mu_t + \varepsilon_t \tag{10}$$

where $\{\varepsilon_t\}$: $N(0,h_t)$. v_t is given as $log(i_t/i_{t-1})$ where i_t is the US or Japanese interest rate and μ_t is the mean of v_t conditional on past information.

Table 1 presents results from the GARCH(1,1) model for the US and Japanese interest rates. The US interest rate is represented by the three-month Treasury bill and Japanese interest rate is represented by callmoney rate.The results show a significant ARCH effect. Also, the shocks to volatility are not explosive since the coefficient on the lagged error term is less than unity. The persistence measure ($\alpha_1 + \beta_1$) is high in all tests, implying permanent shocks to volatility. In addition, Ljung-Box statistics fail to indicate any serial correlation in the standard residuals squared at 5 percent level using eight lags.

EMPIRICAL ANALYSIS

Unit root test

The order of integration of monetary aggregate M2, the scale variable, financial wealth, the opportunity cost, and volatility of the US and Japan interest rates is determined first before the long-run relationship of money demand and the volatility of the US and Japan interest rates are to be examined. The test is to determine whether the variables in the money demand function are stationary or non-stationary in levels and it is to be performed by conducting a unit root test on the level and first difference of the series. Standard tests for the presence of a unit root are based on the work of Dickey and Fuller (1979, 1981), Perron (1988), and Phillip and Perron (1988) for testing the degree of integration of the variables. The augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests for a unit root are performed here.

The augmented Dickey-Fuller (ADF) test is based on the following regressions:

$$\Delta y_t = \alpha + \delta t + \gamma y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta y_{t-i} + \varepsilon_t \tag{11}$$

where ! is the difference operator, t is a time trend, y is the time series variable being tested, ε is the error term, and α, δ, γ, and β are the parameters to be estimated.

Under the Phillip-Peron (PP) test for a unit root, the following estimated models are tested for α equal to unity:

$$y_t = \mu + \alpha y_{t-1} + \varepsilon_t \tag{12}$$

$$y_t = \mu + \alpha y_{t-1} + \varepsilon_t \tag{13}$$

$$y_t = \mu^* + \beta^* \left(t - T/2\right)_t + \alpha^* y_{t-1} + \varepsilon_t^* \tag{14}$$

where y_t is the time series variable at time t, and $\hat{\lambda}$, ε_t, and ε_t^* are error terms. These error terms are of the normal distribution with zero mean. Under the PP unit root test, the estimated model in (14) is first tested for a unit root using the test statistics of $Z(\alpha^*)$, $Z\left(t_{\alpha^*}\right)$, and $Z(\Phi_3)$. If the null hypothesis is accepted, then the drift, μ^*, is equal to zero. Then the null hypothesis $H_0 : (\mu^*, \beta^*, \alpha^*) = (0, 0, 1)$ is tested using $Z(\Phi_2)$. If the null hypothesis is accepted then the next null hypothesis of $H_0 : \left(\mu, \alpha\right) = \left(0, 1\right)$ is tested using $Z\left(\alpha\right)$, $Z\left(t_\alpha\right)$ and $Z(\Phi_1)$ to determine if a series has zero mean. If the null hypothesis is accepted, then the series has a zero mean. Therefore, the appropriate model will be one without the intercept or trend.

Tables 2 and 3 present the results from the various forms of the ADF and PP tests on log levels and log first difference series respectively, based on a standard regression with a constant, and with a constant and time trend. The null hypothesis of the existence of a unit root for the log first difference of all series is overwhelmingly rejected. Therefore, we can be conclude that all the series in our sample are stationary in the log first difference.

Cointegration test with Johansen Maximum Likelihood

Even if macroeconomic time series are nonstationary, there may exist some linear combination of these variables that converge to a long run relationship. Individually, if the series are stationary after differencing and a linear combination of their levels is also stationary, then the series are said to be cointegrated. The long-run equilibrium relationship in the money demand function is determined by using the maximum likelihood approach by Johansen (1988) and Johansen and Juselius (1990) in a multivariate setting. The Johansen-Juselius estimation method is based on the error-correction representation of the vector autoregressive (VAR) model with Gaussian errors. The method provides tests for identifying the number of cointegrating vectors between variables. These tests are based on the trace statistic test and the maximum eigenvalue test. It treats all variables as endogenous thus avoiding an arbitrary choice of dependent variable. It also provides a unified framework of a vector error-correction model. Evidence of cointegration diminishes the possibility of the estimated relationship being spurious.

The *kth* order vector autoregressive (VAR) of Y_t is given as:

$$Y_t = \Pi_1 Y_{t-1} + \Pi_2 Y_{t-2} + \ldots + \Pi_{t-k} Y_{t-k} + C + \Phi t + \xi_t, \quad t = 1, 2, \ldots, T \tag{17}$$

$$Y_t = C + \sum_{i=1}^{k} \Pi_i Y_{t-i} + \Phi t + \xi_t \tag{18}$$

where Y_t is a $p \times 1$ vector of I(1) processes. Y_t is a sequence of random vectors with components $(Y_{1t}, Y_{2t}, \ldots, Y_{pt})$. The residuals of this process, $\xi's$, are drawn independently and identically from a p-dimensional Gaussian distribution with covariance Λ and $Y_{-k+1}, Y_{-k+2}, \ldots, Y_0$ fixed. Thus $\{\xi\} \sim iid\ N(0, \sigma^2_\xi)$. C is a constant term and t is time trend.

The first difference form of the VAR model is:

$$\Delta Y_t = \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \ldots + \Gamma_{k-1} \Delta Y_{t-k+1} + \Pi Y_{t-k} + \Phi t + \xi_t$$

where $\Gamma_i = -(I - \Pi_1 - \ldots - \Pi_i)$ and $\Pi = -(I - \Pi_1 - \ldots \Pi_k)$.

Since Y_{t-k} is I(1), but ΔY_t and ΔY_{t-i} are I(0), it is the Π matrix that conveys the information about the long-run relationship between the Y variables in the model. Π_t is a $p \times p$ matrix which is called a long run impact matrix and the test procedure will examine this Π matrix. In this procedure two likelihood ratio test statistics will be employed.

First, the null hypothesis of at most r cointegrating vectors against a general alternative will be tested by:

$$\text{Trace statistics} = T \sum_{i=r+1}^{p} \ln(i - \lambda_i)$$

Secondly, the null hypothesis of r cointegrating vector against the alternative of $r+1$ will be tested by:

Maximum eigenvalue statistics (λ-max) $= T \ln\left(1 - \lambda_{r+1}\right)$, where λ are the estimated eigenvalues.

Using the multivariate method of cointegrating, we examined if there is any long-run relationship between money demand with the volatility of the US interest rate, and between money demand with the volatility of the Japanese interest rate.

To proceed with the long-run cointegration analysis, the order of the VAR system needs to be determined. The various likelihood ratio (LR) tests are performed and examined for the exclusion of the *(p-1)th* lag. In this study, the general to specific procedure yields the AR model of 8 for both models with the volatility of US and Japanese interest rates. A systematic test procedure for the model specification is performed to examine both the rank order and the deterministic component for the cointegration system simultaneously[3]. Based on the λ-trace statistics at the 5 percent significant level, the procedure suggests a linear trend for the model with US and Japanese interest rates volatility.

The statistical tests regarding the number of cointegrating vector are presented in tables 4 and 5. Result from the test show that at 5 percent level of significance, money demand and other variables i.e consumption, financial wealth, opportunity cost and volatility of the interest rates (US and Japanese) are bound together in the long-run by one cointegrating vector. Normalizing the coefficients of the money demand, the long-run relationships between the money demand in Malaysia with consumption, opportunity cost, volatility of the US and Japanese interest rates, and financial wealth can be expressed as follows:

$$\log(M/P) = 1.695\log(C/P) - 0.439\log R - 0.117\log(VUS) + 0.021\log(FW/P) \qquad (19)$$
$$ (16.845) \qquad (7.281) \qquad (5.273) \qquad (0.296)$$

$$\log(M/P) = 0.968\log(C/P) - 0.121\log R - 0.095\log(VJP) + 0.685\log(FW/P) \qquad (20)$$
$$ (5.757) \qquad (5.091) \qquad (2.427) \qquad (1.083)$$

where *VUS* and *VJP* are the US and Japanese interest rates volatility respectively. Residuals from the systems are tested for serial correlation and reported in Tables 3 and 4. The Ljung-Box and Lagrange Multiplier tests indicate no serial correlation among residuals.

The signs for scale variable, *C* and opportunity cost, *R* are as anticipated in accordance to standard money demand theory. The results indicate an positive relationship between volatility of the US and Japanese interest rates and real money demand in Malaysia. By means of the *t* test, all variables except for the financial wealth (*FW*), are found to be significantly different from zero at 5 percent significance level. The results also indicate a significant effect is imposed by the volatility of the US and Japanese interest rates on the demand for real money in Malaysia. This could be due to the fact that US and Japan are the two major trading partners for Malaysia and the influence could be felt directly. Therefore, any structural change in the interest rates in these two countries will bear some implications toward the demand for real money in Malaysia. The influence of the US and Japanese interest rates volatility can also be explained by the portfolio theory of money demand and transaction demand for money. According to the portfolio theory of money demand and transaction demand for money, an increase in the volatility of interest rates increases the risk of holding fixed-term interest paying securities, and in order to reduce this risk firms and households may wish to hold larger money balances (Garner, 1990). In addition, according Slovin and Sushka (1983) the interest rate volatility can be important because large changes in the interest rate may produce substantial variation in holding period returns for even short-term liquid assets that are sold prior to maturity in order to alter a cash position. This suggest that the risk-averse economic agents will increase their demand for money as the interest rate becomes more volatile.

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[3] A systematic test procedure for model specification is performed to examine both the rank order and deterministic component for the cointegration system simultaneously.

The results in this study also show evidence that the size of the effect imposed by the opportunity cost, in absolute value, is larger than the effect due to the volatility of the US and Japanese interest rates. Thus, the opportunity cost of holding money still imposes a larger effect on money demand function than the volatility of the US and Japanese ineterest rates. Nevertheless, the results indicate that the US and Japanese interest rates volatility could also play a significant role in influencing the demand for money in Malaysia as such it cannot be totally ignored by the policy makers in formulating effective monetary policy for Malaysia.

CONCLUDING REMARKS

This paper estimates the impact of the foreign interest rates volatility on the money demand in a Malaysia. The US 3-month treasury bill and Japanese call money rates are used to represent the foreign interest rates. The conditional variance estimates of the US and Japanese interest rates obtained from GARCH(1,1) model are applied as the US and Japanese interest rates volatility. By applying the Johansen procedure of cointegration the long-run relationship between real M2, real consumption, the opportunity cost of holding money, and real financial wealth, firstly with the US interest rate volatility, and secondly with Japanese interest rate volatility are determined.

The results show that the larger effect in money demand function in Malaysia imposes by opportunity cost as compared to the effect imposes by the volatility of the US and Japanese interest rates. However, the results indicate that the volatility of the US and Japanese interest rates have a significant role in money demand function in Malaysia given the fact the US and Japan are the main trading partners for Malaysia. As such, the role of the volatility of the foreign interest rates (US and Japanese) in formulating the effective monetary policy in Malaysia cannot be totally ignored.

REFERENCES

Arize, A.C., & Darrat, A.F. (1994). Value of Time and Recent U.S. Money Demand Instability. *Southern Economic Journal*, 60(3), 564-578.

Bahmani-Oskooee, M. (1991). The Demand for Money in an Open Economy: The United Kingdom. *Applied Economics*, 23, 1037-1042.

Barnett, W. A. (1978). The User Cost of Money. *Economics Letters*, 1, 145-149.

Belongia, M. T. (2000). Introductory Comments, Definitions, and Research on Indexes of Monetary Services. In M. T. Belongia and J. M. Binner (eds) *Divisia Monetary Aggregate: Theory and Practice*. New York: Palgrave, 2000.

Bollerslev, T. (1986). Generalized Autoregressive Conditional Heteroskedasticity. *Journal of Econometrics*, 31, 307-327.

Breusch, T. S. (1978). Testing for Autocorrelation in Dynamic Linear Models. *Australian Economics Papers*, 17, 334-355.

Choudhry, T. (1999). Does Interest Rate Volatility Affect the U.S. M1 Demand Function? Evidence from Cointegration. *The Manchester School*, 67(6), 621-648.

Dahalan, J. (2004). Divisia Index Monetary Aggregates and Monetary Policy in Malaysia: Does It Matter? *Malaysia Management Journal*, 8, 1, June.

Dickey, D.A., & Fuller, W.A. (1979). Likelihood ratio tests for Autoregressive Time series with a Unit Root. *Econometrica*, 49, 1057-1072.

Dickey, D.A., & Fuller, W.A. (1981). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74, 427-431.

Engle, F. R. (1982). Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of U.K. Inflation. *Econometrica*, 50, 987-1008.

Enders, W. (1995). *Applied Econometric Time Series*. John Wiley & Sons.

Fase, M. M. G., & Winder, C. C. A. (1996a). Wealth and the demand for Money: Empirical Evidence for the Netherlands and Belgium. *De Economist*, 144(4), 569-589.

Fase, M. M. G., & Winder, C. C. A. (1996b). Wealth and the demand for Money in the European Union. *De Nederlandsche Bank - Staff Reports*.

Ford, J. L., Peng, W. S., & Mullineux, A. W. (1992). Financial Innovation and Divisia Monetary Aggregates. *Oxford Bulletin of Economics and Statistics*, 54(1), 87-102.

Ford, J. L., & Mullineux, A. (1996). Financial Innovation and Monetary Aggregates In the UK, 1977-1973. In A. Mullineux (ed) *Financial Innovation, Banking and Monetary Aggregates*. Cheltenham: Edward Elgar.

Fuller, W. A. (1976). Introduction to Statistical Time Series. New York: John Wiley & Sons.

Garner, A. C. (1990). Does Interest Rate Volatility Affect Money Demand? *Federal Reserve Bank of Kansas City*. 99-112.

Godfrey, L. G. (1978). Testing Against General Autoregressive and Moving Average Error Models When the Regressors Include Lagged Dependent Variables. *Econometrica*. 46, 1293-1302.

Johansen, S. "Statistical Analysis of Cointegration Vectors (1988). *Journal of Economic Dynamics and Control*. 12, 231-254.

Johansen, S., & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration with Application to the Demand for Money. *Oxford Bulletin of Economics and Statistics*. 52, 169-209.

Ljung, G. M., & Box, G. E. P. (1978). On a Measure of Lack of Fit in Time Series Models. *Biometrika.* 67, 297-203.

Marquis, M.H. (1989). Interest Rate Volatility in a Partial Equilibrium Model of Household Money Demand. *Journal of Macroeconomics*. 11(1), 67-80.

Mullineux, A. (1996). Monetary Aggregates and Monetary Policy: Some Introductory Remarks. In A. Mullineux (ed) *Financial Innovation, Banking and Monetary Aggregates*. Cheltenham: Edward Elgar.

Osterwald-Lenum, M. (1992). A Note with Quantiles of the Asymptotic Distribution of the Maximum Likelihood Cointegration Rank Test Statistics: Four Cases. *Oxford Bulletin of Economics and Statistics*. 54, 461-472.

Payne, J.E. (1995). Velocity and the Variability of Yields of Financial and Other Assets. *The American Economist*. 39(1), 89-94.

Perron, P. (1988). Trends and Random Walks in Macroeconomic Time Series: Further Evidence from A New Approach. *Journal of Economic Dynamics and Control*, 12, 297-332.

Phillip, P. C. B., & Perron, P. (1988). Testing for Unit Root in Time Series Regression. *Biometrika.* 75, 335-346.

Slovin, M., & Sushka, M. (1983). Money , Interest Rates, and Risk. *Journal of Monetary Economics*. 12, 475-482.

Table 1: Test Results of GARCH(1,1)

US interest rate	Japanese interest rate
$v_t = 0.009 + \varepsilon_t$	$v_t = 0.044 + \varepsilon_t$
(1.065)	(2.113*)
$h_t = 0.001 + 0.392\varepsilon^2_t + 0.596h^2_{t-1}$	$h_t = 0.009 + 0.383\varepsilon^2_t + 0.359h^2_{t-1}$
(1.451) (2.515*) (4.054*)	(2.699*) (1.718**) (1.683**)
$L = 88.601$, $\alpha + \beta = 0.989$, $LB(8)$ $SRS = 3.403$	$L = 49.413$, $\alpha + \beta = 0.742$, $LB(8)$ $SRS = 5.898$

Note:
t – statistics in parentheses. L represents log likelihood, LB is Ljung-Box, SRS is standardize residuals squared.
*/** indicates significant at 5 percent and 10 percent significant level.

Table 2: Unit Root Tests - Log Level

| | | ADF Test | | Phillip-Peron Test | | | | | | |
| | | Model 1 | Model 2 | Model 1 | | | Model 2 | | | |
Variables	Lags	t_{α^*}	t_{α}	$Z(\alpha^*)$	$Z(t_{\alpha^*})$	$Z(\Phi_1)$	$Z(\alpha)$	$Z(t_{\alpha})$	$Z(\Phi_2)$	$Z(\Phi_3)$
RCONS	5	-0.73	-3.02	-0.63	-0.88	9.51**	-16.72	-2.95	7.75**	4.41
RM2	8	-1.39	-1.61	-0.43	-1.19	49.15**	-7.04	-1.89	33.13**	2.35
RFINW	5	-1.02	-3.35	-1.73	-1.16	2.77	-20.16	-3.36	5.06	5.68
R	1	-2.34	-2.28	12.82	-2.17	3.31	-14.00	-2.49	2.19	3.23
VUS	1	-1.01	-1.83	-5.52	-0.78	1.28	-11.82	-2.39	2.76	4.09
VJP	4	-3.12	-4.62	-16.49*	-3.12	4.66	-36.48**	-4.66**	7.28**	10.93**
Critical Value for T=100	*1%*	*-3.51*	*-4.04*	*-19.80*	*-3.51*	*6.70*	*-27.40*	*-4.04*	*6.50*	*8.73*
	5%	*-2.89*	*-3.45*	*-13.70*	*-2.89*	*4.71*	*-20.70*	*-3.45*	*4.88*	*6.49*

Note:
Model 1 include non-zero mean. Model 2 include non-zero mean and linear trend.
The optimal lag length for each of autoregressive process of ADF test is determined by Shwarz Information Criterio (SIC).
The adjusted Z test statistics are given in detail in Perron (1988, pp. 308-309).

The Critical Value of $Z(\alpha^*)$, $Z(\alpha)$, $Z(t_{\alpha^*})$, and $Z(t_{\alpha})$ are given in Fuller (1976, pp. 371 and 373).

The Critical Value of $Z(\Phi_1)$, $Z(\Phi_2)$, and $Z(\Phi_3)$ are given in Dickey and Fuller (1981, pp. 1063).

* and ** indicate rejection the null hypothesis at 1 and 5 percent significant level respectively.

Table 3: Unit Root Tests- Log First Difference

		ADF Test		Phillip-Peron Test						
		Model 1	Model 2	Model 1			Model 2			
Variables	Lags	t_{α^*}	t_{α}	$Z(\alpha^*)$	$Z(t_{\alpha^*})$	$Z(\Phi_1)$	$Z(\alpha)$	$Z(t_{\alpha})$	$Z(\Phi_2)$	$Z(\Phi_3)$
RCONS	5	-4.84**	-4.83**	-290.12**	-14.08**	108.60**	-162.34**	-14.52**	70.37**	105.55**
RM2	8	-3.43**	-3.53**	-113.09**	-8.93**	44.71**	-109.21**	-9.49**	30.03**	45.04**
RFINW	5	-4.90**	-4.88**	84.55**	-13.08**	85.15**	-135.02**	-12.69**	53.71**	80.57**
R	1	-11.02**	-11.01**	4245.32**	-10.99**	70.14**	-121.44**	-11.01**	40.41**	60.62**
VUS	1	-9.47**	-9.48**	-74.52**	-6.95**	23.46**	-74.97**	-6.95**	16.25**	24.26**
VJP	4	-6.88**	-6.84**	-84.35**	-12.74**	74.88**	-116.43**	-11.98**	147.88**	71.82**
Critical Value for	*1%*	*-3.51*	*-4.04*	*-19.80*	*-3.51*	*6.70*	*-27.40*	*-4.04*	*6.50*	*8.73*
T=100	*5%*	*-2.89*	*-3.45*	*-13.70*	*-2.89*	*4.71*	*-20.70*	*-3.45*	*4.88*	*6.49*

Note:

Model 1 include non-zero mean. Model 2 include non-zero mean and linear trend.

The optimal lag length for each of autoregressive process of ADF test is determined by Shwarz Information Criterio (SIC).

The adjusted Z test statistics are given in detail in Perron (1988, pp. 308-309).

The Critical Value of $Z(\alpha^*)$, $Z(\alpha)$, $Z(t_{\alpha^*})$, and $Z(t_{\alpha})$ are given in Fuller (1976, pp. 371 and 373).

The Critical Value of $Z(\Phi_1)$, $Z(\Phi_2)$, and $Z(\Phi_3)$ are given in Dickey and Fuller (1981, pp. 1063).

* and ** indicate rejection the null hypothesis at 1 and 5 percent significant level respectively.

Table 4: Johansen Maximum Likelihood Test for the Number of Cointegrating Vectors for Log Real Money Demand, Real Consumption, Opportunity Cost, Financial
   Wealth and the US Interest Rate Volatility

Hypothese			Test Statistics		5% Critical Value	
H_0	H_1	Eigenvalue	$\lambda - max$	λ - trace	$\lambda - max$	λ - trace
r = 0	r > 1	0.3062	43.1495**	95.1157**	39.97	94.15
r □ 1	r > 2	0.1534	19.5074	41.9661	33.46	68.52
r □ 2	r > 3	0.1285	16.2324	22.4587	27.07	47.21
r □ 3	r > 4	0.042	5.0675	6.2263	20.97	29.68
r □ 4	r = 5	0.0097	1.1589	1.1589	14.07	15.41

Residual Analysis: Test for Serial Correlation

	L-B(25)		LM(1)	LM(4)
$\chi^2(525)$	618.69	$\chi^2(25)$	52.39	36.55
p-value	0.06	p-value	0.11	0.16

Notes:

The cointegrtion model is based on the vector autoregressive model (VAR) with 8lags using likelihood ratio (LR) test. The critical values for λ-Trace and λ-Max statistics are from Osterwald-Lenum (1992). The asterisks indicate significance at the 95 percent (**) level.

Ljung-Box Q statistics or L-B(k) and Langrange Multiplier or LM(k) tests are used to test the null hypothesis of no serial correlation up to order k in the residuals. See Ljung and Box (1978), Breusch (1978), and Godfrey (1978) for detailed discussion on these tests.

Table 5: Johansen Maximum Likelihood Test for the Number of Cointegrating Vectors for Log Real Money Demand, Real Consumption, Opportunity Cost, Financial Wealth, and Japanese Interest Rate Volatility

Hypotheses			Test Statistics		5% Critical Value	
H_0	H_1	Eigenvalue	$\lambda - max$	λ - trace	$\lambda - max$	λ - trace
r = 0	r > 1	0.2808	37.5748**	75.6788**	39.97	94.15
r ☐ 1	r > 2	0.1531	18.9469	38.104	33.46	68.52
r ☐ 2	r > 3	0.1285	12.016	19.157	27.07	47.21
r ☐ 3	r > 4	0.0597	7.0128	7.1411	20.97	29.68
r ☐ 4	r = 5	0.0011	0.1282	0.1283	14.07	15.41

Residual Analysis: Test for Serial Correlation

	L-B (25)		LM(1)	LM(4)
$\chi^2(525)$	673.83	$\chi^2(25)$	41.86	34.89
p-value	0.09	p-value	0.12	0.19

Notes:

The cointegrtion model is based on the vector autoregressive model (VAR) with 8 lags using likelihood ratio (LR) test. The critical values for λ-Trace and λ-Max statistics are from Osterwald-Lenum (1992). The asterisks indicate significance at the 95 percent (**) level.

Ljung-Box Q statistics or L-B(k) and Langrange Multiplier or LM(k) tests are used to test the null hypothesis of no serial correlation up to order k in the residuals. See Ljung and Box (1978), Breusch (1978), and Godfrey (1978) for detailed discussion on these tests.

An Empirical Analysis (Using Panel Data) On The Relationship Between Firm Performance And Corporate Governance Practices

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ABSTRACT

The impact on the performance of firms in Malaysia due to corporate practices and structures was analysed based on data involving 120 Malaysian listed companies over a four-year period from 1996 to 1999. This period encompassed the 1997/98 Asian financial crisis which affected most countries in the Southeast Asian region including Malaysia. Due to the combination of cross-sectional and time-series data, panel data regression techniques were used to analyse performance of the firms using both fixed effects and random effects models. Using return on equity as the dependent variable, it was established that the size of firm, gearing ratio (borrowing) and the proportion of share owners in the firm accounted for by institutional investors significantly influenced the performance of firms. The impact of size on the performance of firms followed a quadratic fashion with performance increasing with the size of the firm up to the optimal size of around 8,839 million ringgit. Beyond that, firm performance declined with increasing size. Borrowing had a negative effect on earnings with 1% increase in borrowing having a 0.14% decrease in return on equity. Finally institutional investors exerted a positive influence on company earnings. The increasing presence of institutional investors would appear to be a good strategy to increase the performance of firms.

INTRODUCTION

Poor governance standards in both corporate entities and government were blamed in part for the East Asian financial crisis. In Asia, corporations tend to follow the 'insider' model with dominant control by owners and large shareholders (Sycip, 1998; Yamazawa 1998). The erosion of investor confidence was identified as one of the major factors that exacerbated the financial turmoil in Malaysia and a number of Asian countries. Many commentators, for example, Noordin (1999) argued that the erosion of investor confidence in Malaysia was brought about by the country's poor corporate governance standards and lack of transparency in the financial system. The restoration of full confidence in the economy by investors would rely on the improvement of corporate governance standards including the adoption of transparency as an important strategy in corporate management. The paper focuses on the corporate practices of the Malaysian companies and attempts to measure its impact on firm performance. Certain corporate structures and practices are examined to determine if they have any effect on company's performance, and these are:

   a. The role of lenders in corporate governance
   b. The governance role of independent directors
   c. The CEO duality structure
   d. The governance role of institutional investors
   e. The concentrated ownership structure
   f. The governance role of audit committees

LITERATURE REVIEW

a.   The Role Of Lenders In Corporate Governance

The role of lenders as a force in corporate governance has not yet been extensively analyzed (Prigge, 1998). Lenders are interested in the repayment of a credit in accordance with the credit contract. Since management's actions are one of the factors determining repayment, lenders may be motivated to carry out monitoring. Billimoria (1997) found evidence to indicate that CEO's of highly leveraged firms were paid less long-term pay.

b.   The Governance Role Of Independent Directors

Byrd/Hickman (1992) report that tender offer bidders with majority-independent boards earn roughly zero stock price returns on average, while bidders without such boards suffer statistically significant losses of 1.8% on average. You et all. (1986) also report a significant negative correlation between proportion of inside directors and bidder stock price returns. This suggests that independent directors may help to restrain the CEOs tendency to build a larger empire, even if this means overpaying to buy another company. Denis/Sarin (1997) report that firms that substantially increased the proportion of independent directors had above-average stock price returns in the previous year. In a study to assess investor reaction to the appointment of additional directors, Rosenstein/Wyatt (1990) found that stock prices increase by about 0.2% on average, when companies appoint additional outside directors. This increase was statistically significant, but economically small.

c.   The CEO Duality Structure

Rechner and Dalton (1991) examined the relation between CEO duality and organizational performance. Their study supports agency theory expectations about inferior shareholder returns from CEO duality. Rechner and Dalton (1989) also examined the effect of CEO duality on risk-adjusted shareholder returns using stock market data for the same sample and period. They found no significant difference between structures. Donaldson & Davis (1991) examined the effects of CEO duality on shareholder returns, and recorded exactly the opposite result to that of Rechner and Dalton (1991). Their results show that the average return on equity of the board with chairs independent of the CEO was 11.5%, less than the average ROE of those companies with CEO duality at 14.8%. The difference was statistically significant, i.e. dual CEO structures outperform independent chair structures.

d.   The Governance Role Of Institutional Investors

Large outside (institutional) shareholders are regarded as an effective monitoring mechanism for a number of reasons. For example, they have a vested interest in minimizing any asymmetry of information which may exist and will therefore vote in accordance with their own interests (Jarrell & Poulson, 1987). In addition to the monitoring role, Shleifer & Vishny (1986) also argue that large outside shareholders assist the market for corporate control simply by being willing to sell their shares should an appropriate bid be made. They, therefore have an incentive to monitor the behavior of managers which should solve the free-rider problem identified by Grossman & Hart (1980).

e.   The Concentrated Ownership Structure

As regards the relationship between ownership concentration and firm performance, empirical results in the U.S. are inconclusive. Demsetz & Lehn (1985) found no significant correlation between ownership concentration and profit rates for 511 large corporations. Morck et al. (1988) reported a piecewise linear relationship of Tobin's Q with board member ownership for 371 Fortune 500 firms, and also found evidence of an inverted "U"-shaped relationship between the degree of ownership concentration and profitability. Stulz (1988) demonstrates that higher managerial ownership can insulate managers from external takeovers, and by allowing managers to block takeover bids, can lower firm value. Using U.S. data, Morck et al. (1988), McConnell & Servaes (1990, 1995), Hermalin & Weisbach (1991), and Holderness et al. (1999) all find firm value to rise with low levels of managerial ownership and to fall with higher levels of managerial ownership.

f.   *The Governance Role Of Audit Committees*

Several empirical studies in accounting have focused on the voluntary formation of audit committees to identify factors affecting an entity's decision to create an audit committee directly responsible for overseeing the financial reporting process (Pincus et al., 1989). Collectively, these studies suggest that larger companies, who are audited by the Big 5 and who have bigger boards with greater representation of outside directors, are among the companies more likely to voluntarily form an audit committee. Several studies document that the presence of an audit committee is associated with fewer incidences of financial reporting problems.

METHODS AND PROCEDURES

Data were gathered on 120 Malaysian public listed companies during the period 1996 to 1999. The samples were public companies fully quoted either on the main board or the second board of the Kuala Lumpur Stock Exchange (KLSE). A large majority of the companies selected (87%) comes from the main board. The samples covered all sectors of the economy and are reported in Table 1 below. The samples were drawn from twenty volumes of KLSE Annual Companies handbook on a random basis until the required quota is reached. The sample selected is line with other previous research on this area, e.g. Yeboah-Duah (1993) studied a sample of 210 Malaysian firms for the period 1984-1991, Mat-Nor et all (1999) uses 79 Malaysian firms, Ruhani Ali and A. U. Sanda (2001) uses 112 KLSE listed firms covering the period 1992-1997, and Yap (2001) uses 69 KLSE companies covering the period 1995-1999.

Dependent Variables

This research utilizes commonly used accounting measures of performance of PLCs as its dependent variables, namely return on equity (ROE) and dividend payouts (DIVPAY). The dividend payout is the percentage of dividend declared for the year and is equivalent to the returns to the shareholders in cash terms. The dividend payouts were extracted from the figures given in the KLSE handbook. The other dependent variable tested is the return on equity (ROE), defined as earnings divided by total ordinary shareholders' fund. These figures were also obtained from the KLSE handbook. Dependent variables were employed as proxy for firm performance. A high score for each of the variable signifies favourable financial performance.

Independent Variables

The independent variables are factors that influences firm performance, and they affect either return on equity (ROE) or dividend payout by driving them up or down. Seven (7) independent variables were selected. They are represented by:
1. NED - measures the proportion of non-executive directors on the board of directors, expressed as a percentage. It is defined as the number of non-executive directors divided by the total number of directors on the board of the company. The co-efficient's expected sign is positive, i.e. the higher the proportion, the more independent is the board in making decisions. This implies better company performance, measured by the dividend payout and return on equity ratio.
2. CHAIRAC - a binary variable. If the chairman of the audit committee is a non-executive director, it is coded one, otherwise zero. This serves to test the degree of independence of the audit committee. An independent chairman is expected to contribute to a more rigorous regime of monitoring and therefore improves performance of the company.
3. CEOCHAR - a binary variable. If the positions of the chief executive officer and the chairman are filled by a single person, the variable has the value of one, and zero if they are not. The coefficient's expected sign is positive. This is because the effectiveness of the board as an internal governance devise will be perceived to have been compromised by the roles not being separated.
4. INST - measures the proportion of large institutional investors. The higher the proportion, the greater is the monitoring role of institutional investors. It also implies that managers of companies would be under pressure to perform to the expectations of institutional investors. The coefficient is expected to be positive.
5. GEAR - measures the proportion of large borrowings. It is a gearing ratio and is defined as long-term borrowings/debt divided by total shareholders ordinary fund plus long-term debt. The coefficient is expected to be positive since greater borrowings imply that lenders/banks will be expected to play a greater monitoring role.

6. CONCEN - measures the proportion of concentrated ownership. The higher the proportion, the greater is the monitoring role of large owners. This is in line with agency theory which hypothesized that greater ownership would reduce agency costs and hence improves performance. The coefficient is expected to be positive.

7. SIZE - captures the size of the company in terms of turnover. Size is expected to be a positive influence on company performance due to greater diversification, economies of large scale production and greater access to new technology and cheaper sources of funds. The coefficient is expected to be positive.

MONITORING MEASURES

Six measures of monitoring were used in this study. These are divided into two types: internal or external monitoring measures.

A. Internal Monitoring Measures

The first internal monitoring measure is the ratio of the number of outside (non-executive) directors to total directors (i.e. inside and outside directors), a measure commonly used by researchers to measure corporate control (e.g. Morck, Shleifer & Vishny, 1988; Weisbach, 1988; Beatty & Zajac, 1994). The second internal monitoring measure is the dichotomous CEO/chairman variable, indicating whether the CEO position is separated from the chairman of the board. The third internal monitoring measure is the presence of an independent audit committee who can be expected to monitor firm performance and give advise. The fourth monitoring measure is the presence of concentrated ownership who by virtue of their large shareholdings will increase their monitoring as their proportion of share capital increases.

B. External Monitoring Measures

The first external monitoring measure is the presence of large creditors, i.e. bank debt. Banks are expected to use their influence as lenders to monitor management to ensure repayment of their principal and interest in the future. The second monitoring measure is the presence of a shareholder with large equity holdings (greater than 5%) who is not on the board (i.e. a blockholder or institutional investors).

HYPOTHESES

H1: Ceteris paribus, a firm's financial performance will be positively related to sound internal corporate governance structures, i.e. internal monitoring measures.

H2: Ceteris paribus, a firm's financial performance will be positively related to monitoring by external stakeholders, i.e. external monitoring measures.

MODEL SPECIFICATION

Most of the literature uses univariate and multivariate logistic regression analysis, or multiple linear regressions to test the firm's value and ownership (Weir, 1997). The method used in this analysis is the pooled ordinary least squares (OLS), applying cross sectional time series standard multiple regressions. Two models are formulated; one based on dividend payouts (DIVPAY) and the other is based on return on equity (ROE) as the dependent variables. H1 and H2 are tested using the following OLS model. The model based on ROE is formulated as follows:

$$ROE_t = a + bNED_{t-1} + cCHAIRAC_{t-1} + dCEOCHAR_{t-1} + eINST_{t-1} + fGEAR_{t-1} + gCONCEN_{t-1} + hLogSIZE_{t-1}.$$

Where;   DIVPAY = dividend payout in percentage
            ROE = Return on Equity ratio
            NED = Non-Executive Directors
            CHAIRAC = Chairman of the Audit Committee
            CEOCHAR = Chief Executive Officer and Chairman of the Board
            INST = Institutional investors

GEAR = Gearing ratio
CONCEN = Concentrated Ownership
LogSIZE = Logarithm of Size of Firm

PANEL DATA REGRESSION ANALYSIS

The ordinary least squares (OLS) regression that was done earlier produced relatively low R squared value and low Durbin-Watson statistics. An examination of the F-test and its P-value clearly indicate that the OLS method was not appropriate (Leamer, 1978). This is because the data under study are panel data or sometimes referred as pooled data or combination of time series and cross-sectional data. Such data requires the use of panel data regression models in order to obtain meaningful results. There are two most frequently used estimation techniques to address these problems, namely the fixed effects model (FEM) and the random effects model (REM) (Gujarati, 2003, chapter 16).

Regression Analysis

The data collected were for the period 1996-1999 (four years) and involved 120 companies. However, only 77 companies were eventually analyzed by the econometric software, Time Series Processor (TSP) version 4.5, due to the presence of outliers and also automatic rejection of incomplete data. Only the dependent variables are expressed in natural logarithm form. Also, another variable was added, namely size-square (sizesq) to test the possibility of a quadratic/curvilinear relationship involving size of company.

RESULTS

The test results showed that for both models, the hypothesis that there was a single set of slope of coefficients and one overall intercept, was rejected (based on the F test, Leamer, 1978 p. 114). The F test analysis involved a separate regression for each individual company. F tests for equality within the TOTAL and WITHIN estimators were derived. In addition, the low value of R squared and judging from the Durbin-Watson statistic for testing that P value equals zero, there is some possibility that a first-order serial correlation of the disturbances will occur. Subsequently, estimation techniques involving the fixed effects and random effects models were used. The results obtained from using these techniques were obviously better, judged by the statistical significance of the estimated coefficients and the high value of R squared. The Hausman specification test confirmed the superiority of the fixed effect models over the random effect models. Hence, further interpretative work and discussions only involve the fixed effects model. The results are summarised in Table 1. Using logged return on equity (LROE) as the dependent variable, three significant variables were obtained at the 10% significance level. The estimated value of the R squared is 0.793 which implies that 79% of the variations in earnings can be explained jointly by the seven independent variables. Also the F-statistic (5.85) is significant at the 1 percent level. Thus, overall the model is a strong one.

Table 1: Results of the fixed effects model (FEM) regression analysis using the natural logarithm of return on equity (LROE) as the dependent variable.

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
NED	-0.0048	0.006	-0.7895	[.431]
CONCEN	-0.0022	0.0106	-0.2108	[.833]
SIZE	0.0009	0.0004	2.0615	[.041]*
SIZESQ	-0.00000005	0.00000002	-2.4396	[.016]*
INST	0.0201	0.0118	1.7061	[.090]*
GEAR	-0.6879	0.1328	-5.1813	[.000]*
CHAIRAC	-0.5734	0.3691	-1.5534	[.123]
CEOCHAR	0.3904	0.261	1.4957	[.137]

R-squared = .7931   Adjusted R-squared = .6682   LM het. test = .3031 [.582]**

Notes:
(1) * denotes statistical significance at 10% level
(2) ** The p values are in brackets

The significant findings relate to the following three independent variables:

INST – The estimated co-efficient is 0.02. This is statistically significant at 10% level, and can be interpreted as: a 1% increase in institutional shareholdings leads to 0.213% (0.02 by 10.665) increase in return on equity given that the mean of institutional holdings is 10.665. For a log-lin (semi-logarithmic) function, the elasticity is the coefficient estimate multiplied by the value of the independent variable. In this study, the mean value of institutional holdings is used (refer to Table 2).

GEAR – The resulting co-efficient is a negative 0.688. The parameter estimate is highly significant (at 0.000 level). It can be interpreted as: 1% increase in gearing leads to a 0.14% (0.688 by 0.20) decrease in return on equity.

SIZE - The resulting co-efficient is 0.02. The results showed that company size in terms of turnover does influence earnings. It seems that a higher turnover leads to higher return on equity. However, further analysis using size-squared indicated a parabola shape curve of size over earnings. This is interpreted as: the larger the company, the better the earnings, but when the company gets too large, earnings began to taper off. By using algebraic differentiation, it is found that earnings are maximized at the turnover level of 8,839 millions or about 66% of the maximum (turnover) size of 13,294 millions.

CONCLUSIONS AND POLICY IMPLICATIONS

There were major significant findings in this study. Out of the seven independent variables that were hypothesized to influence return on equity (ROE), three of these were found to have a significant a major impact on ROE. This finding has some policy implications. The three independent variables which were found to be significant are the influence of institutional investors, gearing (borrowing) and size of company. The results of the latter two variables are expected and are in accordance with the accounting and finance literature. These two variables (gear and size) can actually be termed control variables in this study as the findings are not related to corporate governance structures. The results relating to gearing (borrowing) can be explained as follows: and increase in borrowing burdens the companies with interest payments which are directly charged to the income statement, thus dampening profits. This explains the negative sign for the resulting coefficient. However, according to the literature on corporate governance, high borrowing encouraged the banks and creditors to monitor the company and therefore is expected to contribute to higher profits through investments in value enhancing projects. The results obtained clearly indicated that this is not the case in Malaysia. Banks do not perform such value-enhancing role. The second significant result relating to size is a new contribution to the Malaysian corporate literature because this is the first case to prove that size has been positively identified with earnings. Furthermore, the study identified that the curve function of size against earnings as a parabola and maximized at RM8,839 millions. The study thus proves that even though size matters when it comes to earnings, there is a limit, and a corporation which has become too large can be counterproductive. This can be explained in terms of managers favoring empire building at the expense of the productivity of the company. It can also indicate the CEO's inability to exert control and lack the technical expertise to run large enterprises. The current corporate trend in the USA and Europe is to focus on its core business and get rid of unrelated businesses for which top managers know very little. The study provides evidence that Malaysian companies may have to follow such an example. The third significant variable (inst) is the only one that relates corporate governance structures to firm performance. This finding has been rather surprising as institutional investors are not generally known to be active in monitoring the companies they had invested in Malaysia. The result show a somewhat small increase in earnings of 0.213% for each 1% of institutional holdings in Malaysian companies. This may indicate foreign institutional influence that could prompt Malaysian managers to make value-enhancing decisions. It could also reflect that managers maybe aware of the intense monitoring done by institutional investors and therefore less inclined to expropriate company assets. The small influence of institutional investors indicate that these group is not actively exerting their influence through shareholder activism. Their influence rests in their ability to exit enmasse and such actions could result in a fall in share prices.

Contrary to some written literature, it is found that non-executive directors in Malaysia have no influence on ROE, i.e. profitability of the company. It seems that these non-executive directors are not really independent enough to play a serious monitoring role, and the results seems to indicate that they are not of high calibre to contribute significantly to firm performance. The results also indicate that even if the non-executive directors are a majority on the board, it has not significantly influenced ROE, signifying the lack of independence which is expected of them. The results have shown that audit committees chairman who are non-executive directors in these companies do not play a significant role in influencing ROE. The fact that the chairman of the audit committee is a non-executive director has no bearing on performance. The same is also true even if the majority of committee members are non-executive directors. This can be explained in terms of the committee's lack of independence and skill required from the members. The KLSE has

therefore proposed that members of the audit committee should preferably be qualified accountants. The existence of a dominant personality where the CEO is also the chairman of the board has no bearing on company performance. The debate in the U.K. to separate the roles of the CEO from the chairman of the board seems to be inapplicable to Malaysian firms. It is a shared responsibility of the board to ensure firm performance. Concentrated ownership in these companies has no bearing on company performance and the argument that large blockholders align their interest with the company is not true in Malaysia. According to the agency theory, large blockholders solve the agency problems partially and reduce costs. However, since they have control rights, they maybe in a better position to expropriate company assets and exploit the interest of the minority. Therefore, the owner-managers may have worked hard to increase earnings but these earnings maybe used to enrich themselves, resulting in the company's performance remaining unchanged.

REFERENCES:

Beatty R.P.& E.J.Zajac, 1994; Managerial Incentives, Monitoring and Risk Bearing: A Study of Executive Compensation, Ownership and Board Structure in Initial Public Offerings, Administrative Science Quarterly, 39.

Bilimoria, Diana, 1997; Perspectives on Corporate Control: Implications for CEO Compensation, *Human Relations*, Vol. 50, No. 7, The Tavistock Institute, Ohio.

Byrd, John W & K.A. Hickman, 1992; Do Outside Directors Monitor Managers? Evidence from Tender Offer Bids, Journal of Financial Economics, 32, 195-222.

Demsetz, H. & Lehn, K. (1985). The structure of corporate ownership: causes and consequences, Journal of Political Economy, vol. 93, no. 6, 1155-1177.

Denis, D.J. & A. Sarin, 1997; Ownership and Board Structures in Publicly Traded Corporations, Working Paper.

Donaldson, L. and Davis, J., 1991, 'Stewardship theory or agency theory: CEO governance and shareholder returns', Australian Journal of Management, Vol. 16, No. 1, pp. 49-64.

Grossman, S. and Hart, O. D. (1980); Takeover bids, the free-rider problem and the theory of the corporation, Bell Journal of Economics, Spring, 42-64.

Gujarati, Demodar N. (2003); *Basic Econometrics*, 4rd Edition, McGraw-Hill International.

Hermalin, B. E., and Weisbach, M. S. 1991. The effects of board composition and direct incentives on firm performance. Financial Management 20:101-12.

Holderness, C. G.; Kroszner, R. S.; and Sheehan, D. P. 1999. Were the good old days that good? Changes in managerial stock ownership since the great depression. Journal of Finance 54:435-69.

Jarrell, G. and Poulson, A. (1987) Shark repellents and stock prices: The effects of antitakeover amendments since 1980, Journal of Financial Economics, 17, 127-68.

Leamer, E.E. (1978); *Specification Searches: Adhoc Inference with Non-experimental Data*, Wiley, New York.

Mat-Nor, F., R.M. Said & H. Redzuan (1999); Structure of Ownership and Corporate Financial Performance: A Malaysian Case, Malaysian Management Review, December, 44-48.

McConnell, J. J., and Servaes, H. 1990. Additional evidence on equity ownership and corporate value. Journal of Financial Economics, vol. 27, no. 2: 595-613.

McConnell, J. J., and Servaes, H. 1995. Equity ownership and the two faces of debt. Journal of Financial Economics 39:131-57.

Morck, R.; Shleifer, A.; and Vishny, R. W. 1988. Management ownership and market valuation: An empirical analysis. Journal of Financial Economics 20:293-315.

Noordin, Hanafah, 1999; Judicial Management to the Rescue of Companies in Trouble!, Akauntan Nasional, May, pp 4-5.

Noordin, Hanafah, 1999; Strengthening the Audit Mechanism, Akauntan Nasional, April, p 24.

Pincus, K., M. Rusbarsky & J. Wong, 1989; Voluntary formation of Audit Committees among NASDAQ firms, Journal of Accounting and Public Policy, Vol. 8, 239-265.

Prigge, Stefan, 1998; A Survey of German Corporate Governance, in Hopt K., H. Kanda, M. Roe, E. Wymeersch and S. Prigge's (eds); Comparative Corporate Governance – the State of the Art and Emerging Research, Oxford University Press, U.K.

Rechner, P. L., & Dalton D. R., 1989. The impact of CEO as board chairperson on corporate performance: Evidence vs. rhetoric. Academy of Management Executive, 3 (2): 141-143.

Rechner, P. L., & Dalton, D. R., 1991. CEO duality and organizational performance: A longitudinal analysis. Strategic Management Journal, Vol. 12:155-160.

Rosenstein, Stuart & J.G. Wyatt, 1990; Outside Directors, Board Independence and Shareholder Wealth, Journal of Financial Economics, 26, 175-91.

Rosenstein, Stuart & J.G. Wyatt, 1997; Inside Directors, Board Effectiveness and Shareholder Wealth, Journal of Financial Economics, 44, 229-50.

Ruhani Ali & A. U. Sanda (2001); Further Evidence on the Relationship between Insider Stock Ownership and Firm Performance in Malaysia, proceedings of the Malaysian Finance Association Third Annual Symposium, 26 May 2001, IIU, Malaysia.

Shleifer, A., and Vishny, R. W. 1986. Large shareholders and corporate control. Journal of Political Economy 95:461-88.

Stulz, R. 1988. Managerial control of voting rights: Financing policies and the market for corporate control. Journal of Financial Economics 20:25-54.

Sycip, Washington, 1998; The Managerial Challenge and Response to the 1997/1998 Asian Economic Crisis, Malaysian Management Review, Vol.33, No.2, Dec.1998, pp 1-9.

Weir, Charlie, 1997; Corporate governance, performance and takeovers: an empirical analysis of UK mergers, Applied Economics, vol 29, no 11.

Weisbach, Michael S., 1988; Outside directors and CEO turnover, Journal of Financial Economics, 20, 431-60.

Yamazawa, Ippei, 1998; The Asian Economic Crisis and Japan, The Developing Economies, Vol.XXXVI No.3, Sept. 1998, pp 332-351.

Yap Kiew Heong (2001); Director Ownership and Financial Performance of Listed Companies in

Malaysia, in *Proceedings of the Malaysian Finance Association Third Annual Symposium*, 26 May 2001, IIU, Malaysia.

Yeboah-Duah, K. (1993); Stock Ownership and the Performance of the Firm in Malaysia, Capital Market Review, vol. 1 no.2, 83-108.

You, Victor, R. Caves, M. Smith & J. Henry, 1986; Mergers and Bidders, Wealth: Managerial and Strategic Factors, in: Thomas, III, L. Glenn (ed.), The Economics of Strategic Planning: Essays in Honor of Joel Dean, 201-21, Lexington.

A Different Perspective of Service for Licensed Financial Planner

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ABSTRACT

In the past, the designation financial planner has been widely used by the individual intermediaries of the financial institutions. These individual intermediaries are mainly representatives in marketing financial services especially in life insurance and unit trusts for their companies/principals. Therefore, the financial planner designation has been coined for these professions in the eye of the public. The confusion increased when the Securities Commission had on 5 January 2004 amended the Securities Industry Act 1983 to license a financial planner. Who is actually a financial planner? This paper discusses the fundamental of services and differentiates between a service distributor and a service provider that determine the role of a licensed financial planner. In addition the relevant services marketing strategies are also recommended for practice.

INTRODUCTION

Since the Securities Commission emphasized the development of the financial planning industry under the Capital Market Master Plan in 2001, the term financial planning or financial planners have been the buzzwords for the general public. If we ask any Malaysian on the street what is financial planning or financial planner, most of them would relate it to insurance services, unit trusts and lately including the will writing services. This could be due to the past impression projected by the individual intermediaries from these industries holding themselves as financial planner, financial consultant or financial advisor. Those individual intermediaries who used the above mentioned designations are only marketing or selling financial services on behalf of their companies/principals. Although being identified as financial planner, most of the time they are only distributing the financial services to their customers. There are no actual financial planning services being delivered. If there is, are very minimal act. Hence, these individual intermediaries are merely financial service distributors ("FSDs"). In fact financial planning is not new in Malaysia. In the past decades, some professions from different backgrounds such as accountants, lawyers, investment analyst, and securities brokers have already been providing some form of financial planning services to their customers. These professionals who advise or consult are indeed engaged in financial planning services process, at least partially if not in full-scale service. Therefore, it is the practice of financial planning which has been introduced as a profession by the authorities that may have created some curiosity to the public. The recent licensing requirement enforced by the Securities Commission on 5 January 2004 has further spurred the excitement of existing FSDs as well as the potentials in grabbing the financial planner license. The question here is "are the FSDs aware of the changing role a Licensed Financial Planner ("LFP") or just rushing to change their designation for competitive advantage"? This paper discusses the fundamental of financial planning as a Service that provides insight for the FSDs.

THE FUNDAMENTAL OF SERVICES

"Service is an act or performance offered by one party to another" (Lovelock et al., 1999, p. 5). Another short definition by (Zeithaml,et al., 2003, p.3) is, "Services are deeds, processes, and performances". A service process can be distinguished between a core service and supplementary service. Core service is the main service demanded and consumed by a consumer in exchange of a price, whilst supplementary service is subordinate to the core service, with minimum charge or free (Lovelock, 2001). On the other hand, customer service is a separate process that is provided in support of a company's core products (Zeithaml et al., 2003, p. 4).

Services are intangible in nature which cannot be seen, touch and felt. Therefore, all intangible form of products is classified as services. Services are performances that are difficult to standardize as compare to physical goods. One service delivery varies from another. The production of services is simultaneously with consumption. This makes customer involve in the service production process, failing which a service transaction may not be possible concluded. Researchers also claimed that services are perishable and cannot be inventoried. Hence services have to be consumed during the moment of truth where consumers must participate and experience in the service delivery (Rust et al., 1996); (Lovelock et al., 1999); (Zeithaml et al., 2003).

Services cover a wide range of industries (Zeithaml et al., 2003) including all economic activities whose output is intangible, simultaneous production and consumption, and provides added value in forms such as

convenience, amusement, timeliness, comfort, or health to a purchaser (Quinn et al., 1987). In short, any intangible processes and performances rendered in exchange of a price between service providers and consumers can be termed as services. Fundamentally, marketing of services is different from physical goods. (Rust et al., 1996); (Hoffman et al., 1997); (Lovelock et al., 1999); (Fitzsimmons et al., 2001); (Lovelock, 2001); (Zeithaml et al., 2003).

FINANCIAL PLANNING SERVICES VS FINANCIAL SERVICES

What is a Financial Planning Service? According to the Financial Planning Association of Malaysia ("FPAM") the definition of financial planning is "the process of formulating, implementing and monitoring multifunctional decisions that enable an individual or family to achieve financial goals" (IPFA, 2000, p 1.1). While (Madura, 2002) defined financial planning as the process of planning one's spending, financing, and investing so as to optimize his or her financial situation. Financial planning is a service in nature as it is a process of delivering advisory by a financial planner to a customer. It is a process with a particular method of operations or a series of actions, typically involving multiple steps that often need to take place in a defined sequence (Lovelock et al., 2002). Financial planning services is directed at people's minds. On the other hand, financial services are financial products such as banking facilities and unit trusts produced and marketed by financial institutions. Please refer figure 1. It is also a process and performance service. However, producing of financial services is directed at customers' intangible assets which mainly involve in information processing (Lovelock et al., 2002). Hence, providing financial planning services and marketing of financial services are entirely separate duty and processes. Nevertheless, financial planning services may be different from financial services but it is complementary to the latter.
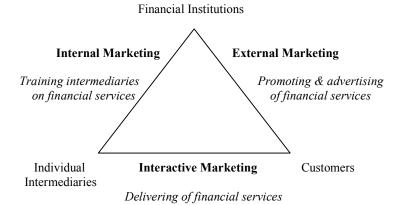
Figure 1: Financial Planning Services vs Financial Services

Financial Planning Services	Financial Services
1. Financial Data Collection	1. Banking Facilities
2. Financial Analysis and Evaluation	2. Life Insurance Policy
3. Financial Advisory and Recommendations	3. Unit Trusts
4. Writing Financial Plan	4. Stocks and Shares
5. Implementing and Monitoring Financial Plan	5. Derivatives

FROM SERVICE DISTRIBUTOR TO SERVICE PROVIDER

Presently, the "financial planning services" industry is still being wrongly conceived and perceived by the general public and the individual intermediaries themselves. As an employee or an agent of the financial institutions, the FSDs' duties are mainly engaging in service distribution. This is depicted in figure 2.

Figure 2: The Services Marketing Triangle
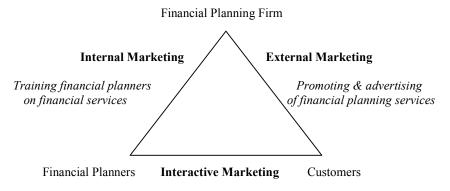
(Source : Adapted from Mary Jo Bitner, "Building Service Relationships: It's All About Promises," Journal of the Academy of Marketing Science 23, 4 (1995): 246-51; Christian Gronroos, Service management and Marketing (Lexington, MA: Lexington Books, 1990); and Philip Kotler, Marketing Management: Analysis, Planning, Implementation, and Control, 8th ed. (Englewood Cliffs, NJ: Prentice Hall, 1994), p. 470).

The financial institutions are the actual service providers in producing and marketing of financial products such as banking facilities and unit trusts. The entire service process started from the financial institutions by developing financial services. The financial institutions would then communicate their financial services to the

customers as well as training the FSDs for further delivery to the customers during the moment of truth. Therefore, most of the time the FSDs are engaging in service delivery while the service providers are responsible for the service quality control. However, the scenario would be different if the FSDs were to practice financial planning services. Please refer figure 3.

Figure 3: The Services Marketing Triangle

Financial Planning Firm

Internal Marketing   **External Marketing**

Training financial planners   *Promoting & advertising*
on financial services   *of financial planning services*

Financial Planners   **Interactive Marketing**   Customers

Delivering of financial services

(Source : Adapted from Mary Jo Bitner, "Building Service Relationships: It's All About Promises," Journal of the Academy of Marketing Science 23, 4 (1995): 246-51; Christian Gronroos, Service management and Marketing (Lexington, MA: Lexington Books, 1990); and Philip Kotler, Marketing Management: Analysis, Planning, Implementation, and Control, 8th ed. (Englewood Cliffs, NJ: Prentice Hall, 1994), p. 470).

Those FSDs who qualified or hold themselves as LFPs must aware that they are no longer a service distributor. They are engaging in service production and development. The LFPs' duties encompass of communicating the availability of services and delivery of services to the customers. At the same, educating the staff or partners on the firm's services to meet customers' expectation and perception.

In the past practice, the FSDs' responsibility in service quality may be lighter as compare to a full-fledge LFP. This is due to the fact that FSDs' quality control focus is more on customer service. However, a LFP has to manage service quality from the basic of core service to supplementary service to customer service. Hence to ensure providing successful financial planning services to customers, the LFPs must apply services marketing concepts and strategies.

SERVICES MARKETING STRATEGIES FOR FINANCIAL PLANNERS

From the earlier service review, we are aware that managing and marketing of services are different and more challenging than any physical goods. Therefore, the marketing strategies adopted for services are also different from physical goods. The following services marketing strategies are recommended for LFPs to evaluate prior embarking their financial planning service.

New Service Development

Since financial planning services are not financial services, LFPs are required to develop their own services as a service provider. The service development stage is of critical to LFPs because the services designed and offered to customers would determine the success rate of a particular financial planning business. Basically, financial planning services are advisories covering Retirement and Estate planning; Investment planning; Insurance planning; Education planning; Assets Management; Tax planning; and Risk management which serve as the core services. However, the fundamental of services process is depends on one's design and innovation. According to (Fitzsimmons et al., 2001) innovation of new services is the process of creating something new with actual product or outcome. As compare to physical goods, developing and innovating new services are more flexible due to its variation. Hence, the most important factors to be considered for effective planning and developing of new financial planning services are objectivity, service must be precise, fact driven and have methodology (Shostack, 1984). Most of the core services are attached with supplementary services such as billing and safekeeping of documents (Lovelock et al., 2002). Therefore, identification and incorporating of supplementary services would enhance the overall financial planning services. A well designed service process

which is far more complicated than physical goods must be documented as a blueprint, use as a guide to control service operations flow.

Service Quality

When ask the FSDs what is service quality. They may equate it with providing quality customer service to meet customer satisfaction. However, service quality is the entirety outcome and experience that a customer judged on the service consumed (Johnston et al., 2001); (Lovelock et al., 2002). The word quality may sometimes create confusion in services as many people use it interchangeably with the word satisfaction. Quality is viewed as long-term, cognitive evaluations of a firm's service delivery, whereas customer satisfaction is a short-term emotional reaction to a specific service experience (Rust et al., 1996). LFP engaging in service business must put greater emphasis in service quality control because it provides the consumer's overall impression of the relative inferiority/superiority of the organization and its services (Bitner et al., 1994). On the other hand, improving service quality may increase customer's perception on better quality which serve as a competitive advantage. In turn, it would leads to higher corporate profits (Buzzell et al., 1987). Like any other services, financial planning services would be perceived by customers as multiple dimensions (Zeithaml et al., 1993). Five dimensions of service quality (Zeithaml et al., 1990) which a LFP must focus are:

- Reliability - are the LFPs dependable in providing financial planning services as promised, over time?
- Tangibles - what are the physical evidence of the LFPs' services that can increase customer's confidence?
- Responsiveness - are the LFPs helpful and able to provide prompt service?
- Assurance - are the LFPs knowledgeable, competent, polite, and trustworthy?
- Empathy - do the LFPs provide caring and personalized attention?

Reliability is one of the most important factors because it is an outcome measure judged by the customers after the service experience. Meantime, the other four dimensions should be controlled carefully during the moment of truth, as customers would evaluate during the process of delivery (Lovelock et al., 2002).

Service Promotion and Education

When a FSD market and distribute financial services on behalf of the financial institutions, they are not required to invest in marketing communication. Most of the time, the financial institutions are doing the promotion for their own financial services. The scenario is different for FSD who turning into a LFP. As a service provider, LFP need to adopt marketing communication for business success. As depicted in figure 3, LFP need to promote their services to the customers which is known as External Marketing. However, since financial planning services are intangible in nature effective communication strategies need to reflect the special characteristics of services (Mortimer et al., 1998). No doubt, intangible services are more challenging to promote. Therefore, LFP should create tangible effects such as memorable logo or metaphors for the services offered in order to capture customers' attention, interest, and perception. The only way to make customers remember the unseen services all the time is to have consistent and continuous communication. Promoting services shall not limited to its features only because the promises set must be able to meet customers' expectation. Since customer is involves in service production, they have to be educated on the service process so that they aware and prepare mentally for the future consumption of the service. Their knowledge on the service process would ensure certain level of service quality during the service delivery. Service promotion and education would reflect what are the actual service processes the customers expect. Education also needs to be extended to the internal staff as well in order to keep the promises that had set during the marketing communication.

Building Competitive Advantage

In the business world, there is no person can capture all the market and conquer everything. Lovelock stressed that it is not realistic to capture all the customers as there are too many, widely scattered, and too varied in their needs, purchasing behavior, and consumption patterns. Company need to focus its effort on those customers it can serve best (Lovelock, 2001). How do the LFP focus and differentiate themselves from competitors? According to Johnston, there are four focus strategies to create a niche (Johnston, 1996). Please refer figure 4.

Figure 4: Basic Four Strategies for Services

Breadth of Service Offerings

	Narrow	Wide	
	Service Focused	Unfocused (Everything for everyone)	Many
			No. of Markets Served
	Fully Focused (Service & Market Focused)	Market Focused	Few

(Source: Robert Johnston, "Achieving Focus in Service Organisations," The Service Industries Journal 16 (January 1996): 10-20)

A *fully focused* firm provides a very limited range of services to a narrow and specific segment. This strategy would enable the LFPs to concentrate in serving a specific market segment with specialized services. For those LFPs with a pool of specialized human resources, market-focused can be adopted. A *Market-focused* firm concentrates on a narrow market segment but has a wide range of services. Meantime, LFPs with limited human resources can consider *Service-focused* strategy which offer a narrow range of services to a fairly broad market. Finally, *Unfocused* means firms that try to serve the broad markets by offering everything for everyone. LFPs are discouraged to stay in this position, as it would be detrimental for business in the long-term.

Based on Johnston' Basic Four Strategies model, it can help LFPs to craft a niche on which and what market segment to target at.

CONCLUSION

The key highlight on this paper is on the fundamental differences between a FSD and LFP. This would serve as reminder for any FSD who wish to practice as a LFP so that they would expect to change their role as a service distributor to a service provider. The service marketing strategies discussed also provides an insight for LFP to evaluate on their practices. In conclusion, the success transition of a FSD to a LFP would all depends on the changing mindset and perception on the fundamental of services of a "financial planner".

REFERENCES

Bitner M.J. and Hubbert A.R., Encounter Satisfaction Versus Overall Satisfaction Versus Service Quality: The Consumer's voice, in Rust R.T. and Oliver R.L. (eds), *Service Quality: New Directions in Theory and Practice, Sage Publications*, Thousand Oaks, Cali., 1994, pp. 72-94.

Christopher Lovelock & Lauren Wright, (1999), *Principles of Service Marketing and Management*, New Jersey: Prentice-Hall.

Christopher Lovelock (2001), *Services Marketing: People, Technology, Strategy*, 4th Edition, New Jersey: Prentice-Hall.

Christopher Lovelock & Lauren Wright (2002), *Principles of Service Marketing and Management*, 2nd Edition, New Jersey: Prentice-Hall.

G. L. Shostack (1984), *Service Design in the Operating Environment, in Developing New Services*, ed. W. R. George and C. Marshall, Chicago: American Marketing Association, pp 27-43.

IFPA, (2000), CFP Conversion Course, Malaysia.

J.B. Quinn, J.J. Baruch, and P. C. Paquette, "Technology in Services", *Scientific American* 257, no.6 (December 1987), pp. 50-58.

James A. Fitzsimmons & Mona J. Fitzsimmons (2001), *Service Management: Operations, Strategy, and Information Technology*, 3rd Edition, Singapore: McGraw-Hill.

Jeff Madura (2002), *Personal Finance*, Boston, Pearson Education.

K. Douglas Hoffman & John E.G. Bateson (1997), *Essential of Services Marketing*, Fort Worth, TX: The Dryden Press.

Kathleen Mortimer & Brian P. Mathews, The Advertising of Services: Consumer View v. Normative Dimension, *The Service Industries Journal* 18 (july 1998): 14-19.

Mary Jo Bitner, "Building Service Relationships: It's All About Promises," *Journal of the Academy of Marketing Science* 23, 4 (1995): 246-51; Christian Gronroos, *Service management and Marketing* (Lexington, MA: Lexington Books, 1990); and Philip Kotler, *Marketing Management: Analysis, Planning, Implementation, and Control,* 8th ed. (Englewood Cliffs, NJ: Prentice Hall, 1994), p. 470

Robert D. Buzzell & Bradley T. Gale (1987), *The PIMS Principles: Linking Strategy to Performances*, New York, The Free Press.

Robert Johnston, Achieving Focus in Service Organizations, *The Service Industries Journal* 16 (January 1996): 10-20.

Robert Johnston & Graham Clark (2001), *Service Operations Management*, UK, Prentice Hall.

Roland T. Rust, Anthony J. Zahorik & Timothy L. Keiningham (1996), *Service Marketing*, New York: HarperCollins.

Valarie A. Zeithaml, A. Parasuraman, and Leonard L. Berry (1990), *Delivering Quality Service: Balancing Customer Perceptions and Expectations,* New York, The Free Press.

Valarie A. Zeithaml, A. Parasuraman, and Leonard L. *Berry, Strategic Positioning on the Dimensions of Service Quality, in Advances in Services Marketing and Management*, vol. 2, ed. Teresa A. Swartz, David E. Bowen, and Stephen W. Brown (Greenwich, CT: JAI Press, 1993), pp. 207-28.

Valarie A. Zeithaml & Mary Jo Bitner (2003), *Services Marketing: Integrating Customer Focus Across the Firm*, 3rd Edition, New York: McGraw-Hill.

G. L. Shostack (1984), Service Design in the Operating Environment, in Developing New Services, ed. W. R. George and C. Marshall, Chicago: *American Marketing Association*, pp 27-43.

Episodic Transient Behaviour of Dependencies:
Evidence from Kuala Lumpur Composite Index

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ABSTRACT

This study utilizes the windowed-test procedure of Hinich and Patterson (1995) to examine the data generating process of KLSE CI returns series. Our econometrics results indicate that linear and non-linear dependencies play a significant role in the underlying dynamics of the returns series, implying the potential of returns predictability. However, these dependency structures are not stable and persistent across time as the results reveal their episodic and transient behaviour, and hence do not bring much benefit to investors. Moreover, for most of the time periods, the returns series move along at a close approximation to random walk. As a whole, the results do not constitute strong evidence against the weak-form EMH in KLSE.

INTRODUCTION

The efficient market hypothesis (EMH) introduced three decades ago was a major intellectual advance and much research endeavour has been devoted over the years to examine the efficiency of stock market price formation, both in developed and emerging stock markets. The phenomenal growth in this body of literature is partly due to the concern and interest of financial economists and investment communities on the predictability of stock prices. Within this framework, the random walk theory of stock prices, which postulates that future price movements cannot be predicted from historical sequence of stock prices, has been widely employed to test the efficiency of stock market, particularly in the context of weak-form efficiency. The justification is that in an efficient market, new information is deemed to come in a random fashion, thus changes in prices that occur as a consequence of that information will seem random. Therefore, price movements in a weak-form efficient market occur randomly and successive price changes are independent of one another.

Over the past two decades, the efficiency of the Kuala Lumpur Stock Exchange (KLSE) of Malaysia has received considerable attention from researchers. Generally, the empirical evidence reported suggests the market is weak-form efficient, for instance, Barnes (1986), Laurence (1986), Saw and Tan (1989), Annuar *et al.* (1991, 1993), Kok and Lee (1994) and Kok and Goh (1995), just to name a few. However, empirical evidence of inefficiency cannot be suppressed, which is documented in Yong (1989, 1993). Another recent study by Lai *et al.* (2003) using the variance ratio test also reveals the non-randomness of successive price changes in the KLSE.

Though the empirical results on the KLSE are mixed, one notable similarity of all the aforementioned studies is the application of standard statistical tests- serial correlation test, runs test, variance ratio test and unit root tests, to uncover linear serial dependencies or autocorrelation in the data. However, the lack of linear dependencies does not imply that the series are random as there might be other more complex forms of dependencies which cannot be detected by these standard methodologies. Even Fama (1965: 80) admitted that linear modelling techniques have limitations, as they are not sophisticated enough to capture complicated 'patterns' that the chartist sees in stock prices. Steurer (1995: 202) expressed similar opinion, in which he argued that there is an

order to the apparent randomness of the market. This order is so complex that the random walk concept is proven by the standard linear statistical tests. Another researcher, Brooks (1996: 307) agreed that series of financial returns often appear completely random to standard linear and spectral tests. However, the author strongly believed that if a different approach, using more powerful techniques, it may be possible to uncover a more complex form of dependencies in these series.

One of the possibilities that might contribute to the departure from random walk is the presence of non-linear serial dependencies in the underlying data generating process (DGP). Even the influential paper of Fama (1970: 394) acknowledged this possibility, "*Moreover, zero covariances are consistent with a fair game model, but as noted earlier, there are other types of nonlinear dependence that imply the existence of profitable trading systems, and yet do not imply nonzero serial covariances*". In this regard, Hinich and Patterson (1985) is the first published paper reporting evidence of non-linearity in common stock returns. As recalled by Patterson and Ashley (2000), the original manuscript of Hinich and Patterson (1985) met with resistance from the finance journals because finance academics were reluctant at that time to recognize the importance of distinguishing serial correlation from non-linear serial dependencies. Subsequent evidence documented in Scheinkman and LeBaron (1989), Hsieh (1991), Abhyankar *et al*. (1995, 1997), Barkoulas and Travlos (1998), Opong *et al*. (1999) and Ammermann and Patterson (2003) strongly suggest that non-linearity is a cross-sectionally universal phenomenon.

The evidence of non-linearity has strong implication on the weak-form EMH for it implies the potential of predictability in financial returns. Specifically, if investors could have profitably operated a trading rule (net of all transactions costs) that exploits this detected non-linearity, it would be at odds with the weak-form EMH, which postulates that even non-linear combinations of previous prices are not useful predictors of future prices (Brooks, 1996; Brooks and Hinich, 1999; McMillan and Speight, 2001). However, Hsieh (1989) argued that the standard statistical tests such as serial correlation test, runs test, variance ratio test and unit root tests may fail to detect non-linear departure from the random walk hypothesis. In this regard, those earlier KLSE studies in favour of EMH might have drawn incorrect inferences or even policy recommendations since they have implicitly disregarded the presence of non-linearity[1]. This concern is well directed as Lim *et al.* (2003a) and Lim and Tan (2003) provided convincing evidence that non-linearity plays a significant role in the underlying dynamics of the Malaysian stock market.

In the weak-form test of EMH, one has to be cautious when interpreting the results of linear and non-linear serial dependencies. There is no doubt that the conclusion of weak-form market efficiency can be made when the random walk hypothesis cannot be rejected by a robust test such as the Brock-Dechert-Scheinkman (BDS) test[2]. However, when the hypothesis is instead rejected due to the presence of certain dependency structures, it will be a strong statement to conclude that the market is inefficient. This was highlighted by Ko and Lee (1991: 224), "*If the random walk hypothesis holds, the weak form of the efficient market hypothesis must hold, but not vice versa. Thus, evidence supporting the random walk model is the evidence of market efficiency. But violation of the random walk model need not be evidence of market inefficiency in the weak form*". The deciding factor here is whether those detected patterns in the historical sequence of stock prices can be exploited by investors to earn abnormal rates of returns. To reiterate, though the evidence of linear and non-linear dependencies implies the potential of returns predictability, it has to be further demonstrated, in order to reject the weak-form EMH, that investors are able to profitably exploit those detected underlying patterns. For instance, Kok and Lee (1994) and Kok and Goh (1995) argued that though daily price series are found to be serially correlated in their respective studies, the magnitude of the correlations is not large enough for any mechanical trading rules to be devised for profitable investment timing. Hence, the presence of linear dependencies in their studies cannot be taken as evidence against the weak-form EMH. In contrast, the potential of predictability as suggested by the variance ratio test results in Lai *et al.* (2003) is verified by the significantly positive returns generated by the fixed length moving average (FMA) and variable length moving average (VMA) trading rules even in the presence of trading costs. Another excellent piece of work is provided by Ammermann and Patterson (2003), in which the authors found that the detected non-linear dependency structures are not persistence enough to allow improvements over the random walk for predicting stock returns. Rather, these dependencies show up at random intervals for a brief period of time but then disappear again before they can be exploited by investors.

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[1] Liew *et al*. (2003) demonstrated that the conventional diagnostic tests are unable to identify the inadequacy of linear model for most of the Asian real exchange rates under study. In this case, using a mis-specified linear model will result in incorrect inferences and wrong clues in policy matters.

[2] The BDS test developed in Brock *et al*. (1987, 1996) has been proven to be quite powerful in detecting departures from i.i.d. behaviour in some Monte Carlo simulations (see, for example, Brock *et al*., 1991; Hsieh, 1991). In particular, the test has good power to detect at least four types of non-i.i.d. behaviour: non-stationarity, linear dependencies, non-linear stochastic process and non-linear deterministic process. Lim *et al*. (2003b) provided a literature review and brief discussion on the BDS test. The authors also applied the test to re-examine the random walk hypothesis in the Malaysian stock market.

The above discussion clearly shows that it is not sufficient to only uncover 'patterns' in the underlying DGP, but requires further verification on its predictability. One alternative approach[3] is to ensure that the detected patterns are persistent across time in order for them to have much benefit to investors (Ammermann and Patterson, 2003). To achieve this objective, the present study utilizes the windowed-test procedure of Hinich and Patterson (1995). The test is designed to detect episodes of transient serial dependencies within a data series, by breaking the full sample into smaller sub-samples or windows of data. In other words, this procedure examines whether the dependencies found in the full sample are in fact due to strong but episodic occurrences that appear only infrequently and fleetingly. Hinich and Patterson (1995), Brooks and Hinich (1998), Brooks *et al.* (2000) and Ammermann and Patterson (2003) have utilized this procedure to investigate the time series properties and stability of the underlying dynamics of financial data.

This study is further motivated by the recent empirical findings of episodic transient behaviour of dependencies in financial time series of developed markets. Brooks and Hinich (1998) found that the Sterling exchange rates are characterized by transient epochs of dependencies surrounded by long periods of white noise, suggesting that the serial dependency structures detected are not stable, but rather vary over time. Similar application to stock indices by the authors reveals the prevalence of these statistical features. In Ammermann and Patterson (2003), a closer examination via the windowed-testing procedure of Hinich and Patterson (1995) shows that the detected non-linear dependencies do not appear to be cross-temporally universal in that there are few brief periods in which the dependencies are very noticeable while other periods, in fact most of the time, the returns rather closely approximating a random walk. This means that the significant full sample results for non-linearity are actually triggered by the activity within a few relatively short "pockets" of highly non-linear data. It was suggested by the above two studies that these episodic transient behaviour are likely to be prevalent in many financial markets. Thus, it would be interesting to investigate whether the financial data of developing countries exhibit similar instability in the DGP. With this motivation, along with its profound implications on the weak-form EMH as discussed earlier, this study attempts to make a modest contribution to the current literature by broadening the existing evidence to include the emerging Malaysian stock market.

In the following section, this paper gives a brief description of the data and the methodology used in this study. Section III presents the empirical results as well as the analysis of the findings. Finally, concluding remarks are given at the end of the paper.

METHODOLOGY

The Data

This study utilizes the daily closing values of Kuala Lumpur Stock Exchange Composite Index (KLSE CI) for the sample period of 2 January 1990 to 30 June 2002. The price series obtained are used to compute a set of continuously compounded percentage returns for the KLSE CI, using the relationship:

$$r_t = 100 * \ln(P_t/P_{t-1}) \tag{1}$$

where P_t is the closing price on day t, and P_{t-1} the rate on the previous trading day.

Hinich and Patterson's Windowed-Test Procedure

In the windowed-test procedure of Hinich and Patterson (1995), a correlation portmanteau test similar to the Box-Pierce Q-statistic is developed for the detection of correlation or linear serial dependencies within a window. For detecting non-linear serial dependencies within a window, the procedure uses a bicorrelation portmanteau test, which can be considered as a time-domain analog of the Hinich bispectrum test statistic (Hinich, 1982). In applying these tests, the full sample is broken down into smaller sub-samples or windows of data. If the full data sample does exhibit significant linear or non-linear serial dependencies, but there are only a few smaller windows that are significant, then this suggests the data may instead be characterized by episodes of transient dependencies. In other words, it is the activity of these few windows that is actually driving the results of the overall sample. As demonstrated in the Monte Carlo simulations of Hinich and Patterson (1995), the test performed well even with small sample sizes.

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[3] The conventional approach is to examine whether trading rules can generate abnormal rates of returns, net of all transactions costs, as adopted by Lai *et al.* (2003). However, Neely (1997: 29) cautioned that: "*The rule should be commonly used to reduce the problem of drawing false conclusions from data mining- a practice in which many different rules are tested until, purely by chance, some are found to be profitable on the data set. Negative test results are ignored, while positive results are published and taken to indicate that trading rule strategies can yield profits*".

In this section, we provide a brief description of the test statistics used in this windowed-test procedure[4]. Let the sequence $\{y(t)\}$ denote the sampled data process, where the time unit, t, is an integer. The test procedure employs non-overlapped data window, thus if n is the window length, then k-th window is $\{y(t_k), y(t_k+1),\ldots, y(t_k+n-1)\}$. The next non-overlapped window is $\{y(t_{k+1}), y(t_{k+1}+1),\ldots y(t_{k+1}+n-1)\}$, where $t_{k+1} = t_k+n$. The null hypothesis for each window is that $y\{t\}$ are realizations of a stationary pure noise process[5] that has zero bicovariance. The alternative hypothesis is that the process in the window is random with some non-zero correlations $C_{yy}(r) = \mathrm{E}[y(t)y(t+r)]$ or non-zero bicorrelations $C_{yyy}(r, s) = \mathrm{E}[y(t)y(t+r)y(t+s)]$ in the set $0 < r < s < L$, where L is the number of lags.

Define $Z(t)$ as the standardized observations obtained as follows:

$$Z(t) = \frac{y(t) - m_y}{s_y} \tag{2}$$

for each $t = 1, 2,\ldots, n$ where m_y and s_y are the sample mean and sample standard deviation of the window.

The sample correlation is:

$$C_{ZZ}(r) = (n-r)^{-\frac{1}{2}} \sum_{t=1}^{n-r} Z(t)Z(t+r) \tag{3}$$

The C statistic, which is developed for the detection of linear serial dependencies within a window, is defined as:

$$C = \sum_{r=1}^{L} [C_{ZZ}(r)]^2 \quad \sim \chi^2_{(L)} \tag{4}$$

The (r, s) sample bicorrelation is:

$$C_{ZZZ}(r,s) = (n-s)^{-1} \sum_{t=1}^{n-s} Z(t)Z(t+r)Z(t+s) \quad \text{for} \quad 0 \leq r \leq s \tag{5}$$

The H statistic, which is developed for the detection of non-linear serial dependencies within a window, is defined as:

$$H = \sum_{s=2}^{L} \sum_{r=1}^{s-1} G^2(r,s) \quad \sim \chi^2_{(L-1)(L/2)} \tag{6}$$

where $G(r,s) = (n-s)^{\frac{1}{2}} C_{ZZZ}(r,s)$

In both the C and H statistics, the number of lags L is specified as $L = n^b$ with $0 < b < 0.5$, where b is a parameter under the choice of the user. Based on the results of Monte Carlo simulations, Hinich and Patterson (1995) recommended the use of $b=0.4$ in order to maximize the power of the test while ensuring a valid approximation to the asymptotic theory.

A window is significant if either the C or H statistic rejects the null of pure noise at the specified threshold level. This study uses a threshold of 0.01. In this case, the chance of obtaining a false rejection of the null is approximately one out of every 100 windows. With such a low-level threshold, it would minimize the chance of obtaining false rejections of the null hypothesis indicating the presence of dependencies where these actually do not exist.

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[4] Interested readers can refer Hinich and Patterson (1995) and Hinich (1996) for a full theoretical derivation of the test statistics and some Monte Carlo evidence regarding the size and power of the test statistics.

[5] A stationary time series is called pure-noise or pure white-noise if $y(n_1),\ldots, n_N$. A white noise time series, by contrast is one for which the autocovariance function is zero for all lags. Whiteness does not imply that $y(n)$ and $y(m)$ are independent for $m \neq n$ unless the series is Gaussian.

Another element that must be decided upon is the choice of the window length. In fact, there is no unique value for the window length. According to Brooks and Hinich (1998), the window length should be sufficiently long to provide adequate statistical power and yet short enough for the test to be able to pinpoint the arrival and disappearance of transient dependencies, which is the main purpose of using a windowed-test procedure. In this study, we followed the choice of Brooks and Hinich (1998) in which the data are split into a set of non-overlapping windows of 35 observations in length, approximately seven trading weeks. In fact, it was found that the choice of the window length does not alter much the results of both test statistics.

EMPIRICAL RESULTS

Table 1 provides summary statistics for the returns series in order to get a better view of some of the important statistical features. The means are quite small. The KLSE CI returns series exhibit some degree of positive or right-skewness. On the other hand, the distributions are highly leptokurtic, in which the tails of its distribution taper down to zero more gradually than do the tails of a normal distribution. Not surprisingly, given the non-zero skewness levels and excess kurtosis demonstrated within these series of returns, the Jarque-Bera (JB) test strongly rejects the null of normality.

Table 1: Summary statistics for KLSE CI Returns Series

	KLSE CI Returns Series
Sample Period	2/1/1990-30/6/2002
No. of observations	3259
Mean	0.007818
Median	0.000000
Maximum	20.81737
Minimum	-24.15339
Std deviation	1.679596
Skewness	0.457460
Kurtosis	38.02681
JB normality test statistic	166713.4
p-value	(0.000000)*

Note: * Denotes very small value

Table 2 presents the correlation (*C*) and bicorrelation (*H*) test statistics for the full data sets. If the *C* and *H* statistics are highly significant, it will then prompt us to examine whether these serial dependency structures are stable or instead their occurrences are episodic and transient in nature. The results in Table 2 reveal that both the *C* and *H* statistics are highly significant, with extremely small *p*-values[6]. This indicates the non-randomness of successive price changes in KLSE, with strong evidence of linear and non-linear serial dependencies within the KLSE CI returns series. The present results corroborate the findings of linear dependencies in Yong (1989, 1993) and Lai *et al.* (2003), and evidence of non-linearity reported by Lim *et al.* (2003a) and Lim and Tan (2003). This also provides some plausible explanation to the rejection of the random walk hypothesis by the BDS test in Lim *et al.* (2003b).

Table 2: *C* and *H* Statistics for KLSE CI Returns Series

	KLSE CI Returns Series
Sample Period	2/1/1990-30/6/2002
No. of observations	3259
No. of lags	25
No. of bicorrelations	300
p-value	
- *C* Statistic	0.0000*
- *H* Statistic	0.0000*

Note: * denotes extremely small *p*-value.

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[6] Instead of reporting the *C* and *H* statistics as chi-square variates, the T23 program written by Hinich reports the statistics as *p*-values. Based on the appropriate chi square cumulative distribution value, the T23 program transforms the computed statistic to a *p*-value.

Subsequently, we examine whether the detected dependency structures in the full sample, both linear and non-linear, are in fact due to strong but episodic occurrences that appear only infrequently and fleetingly. Table 3 shows the results for the windowed testing, in which the data are split into a set of non-overlapping windows of 35 observations in length, approximately seven trading weeks. In this case, four lags are used in calculating both the C and H statistics. The fifth row in Table 3 shows the number of windows where the null of pure noise is rejected by the C statistic[7]. In parenthesis is the percentage of significant C windows. The results show that the null is rejected in six windows by the C statistic, which is equivalent to 6.45%. By using a threshold level of 0.01, we would expect the C statistic to reject 1% of the windows by random chance. However, the percentage of windows exhibiting significant linear serial dependencies is greater than the expected 1%. Similarly, the percentage of significant H windows is also larger than the 1% nominal threshold level, as displayed in the seventh row of the same table, suggesting that the rejection is not purely by chance.

Since both the C and H statistics are highly significant for the full data series as reported in Table 2, one would expect these serial dependencies to be persistent throughout the data or at least many more of the windows to exhibit strong serial dependencies. Instead, these significant test results in the full data series are reflected in only a relatively few windows. In other words, it is the activity of these few windows that is actually driving the results of the overall sample. Specifically, out of the total ninety three windows, only six (6.45%) exhibit significant linear serial dependencies and four (4.30%) exhibit non-linear serial dependencies. These results might be able to explain the mixed findings of those KLSE studies using standard methodologies and the KLSE CI data. It is possible that the serial correlation test, runs test and unit root tests employed in Barnes (1986), Saw and Tan (1989), Annuar *et al.* (1993) and Kok and Goh (1995) are unable to detect linear dependencies in these few windows. In contrast, the results of Lai *et al.* (2003) show that variance ratio test has higher power in detecting departure from the random walk hypothesis.

These episodic transient dependencies in the data indicate that the KLSE CI returns series are not stable, with the returns during most of the time periods move along at a close approximation to random walk, while during the remaining time periods (ten windows) they are characterized by highly significant linear and non-linear serial dependencies. The windowed-test procedure has an added advantage in that it permits a closer examination of the precise time periods during which these dependencies are occurring. Table 3 also reports these time periods, which are potentially useful for our future investigation into the causes of these detected episodic transient dependencies.

Table 3: Windowed-Test Results for KLSE CI Returns Series

	KLSE CI Returns Series
Total number of windows	93
No. of lags	4
No. of bicorrelations	6
Significant C windows	6 (6.45%)
Dates of significant C windows	29/5/1990-16/7/1990
	7/5/1991-24/6/1991
	13/8/1991-30/9/1991
	7/1/1992-24/2/1992
	21/7/1992-7/9/1992
	29/5/2001-16/7/2001
Significant H windows	4 (4.30%)
Dates of significant H windows	17/7/1990-3/9/1990
	5/3/1996-22/4/1996
	4/8/1998-21/9/1998
	4/9/2001-22/10/2001

CONCLUSIONS

This study utilizes the windowed-test procedure of Hinich and Patterson (1995) to examine the data generating process of KLSE CI returns series. Our econometrics results indicate that linear and non-linear dependencies play a significant role in the underlying dynamics of the returns series examined. However, these dependencies are not stable and persistent as they are episodic and transient in nature. Given the prevalence of these episodic transient dependencies across financial markets in the world, it would certainly be important to the field of finance and deserve the attention of researchers.

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[7] In this study, the threshold level has been set at 0.01. The level of significance is the bootstrapped thresholds that correspond to 0.01.

At first glance, the evidence of linear and non-linear dependencies indicates departure from random walk and hence implies the potential of returns predictability. However, as discussed in the earlier section, in order to reject the weak-form EMH, one has to demonstrate that investors are able to profitably exploit these detected dependency structures. The episodic transient behaviour of these dependencies suggests that they are not stable and persistent across time for investors to benefit from it. As illustrated in Table 3, these significant dependencies show up at random intervals for a brief period of time but then disappear again before they can be exploited by investors. The results, taken as a whole, do not constitute strong evidence against the weak-form EMH as the returns series move along at a close approximation to random walk for most of the time periods.

It would be interesting to investigate the events that triggered these episodic transient dependencies in the data. This is possible because the windowed-test procedure of Hinich and Patterson (1995) permits a closer examination of the precise time periods during which these dependencies, linear and non-linear, are occurring, as reported in Table 3. For instance, in the work of Ammermann and Patterson (2003), the linear dependencies are found to be directly attributable to changes in the Taiwan Stock Exchange's price limits that were made during 1987 and 1988. Brooks *et al.* (2000) found that the non-linear dependency structures in their data are due to widespread upsets in the currency markets and a change in US accounting procedures. This line of inquiry is certainly worth investigating and will be included in future research agenda.

REFERENCES

Abhyankar, A.H., Copeland, L.S. and Wong, W. 1995. Nonlinear dynamics in real-time equity market indices: evidence from the United Kingdom. *Economic Journal* **105**: 864-880.

Abhyankar, A.H., Copeland, L.S. and Wong, W. 1997. Uncovering nonlinear structure in real time stock-market indexes: the S&P 500, the DAX, the Nikkei 225, and the FTSE 100. *Journal of Business and Economic Statistics* **15**: 1-14.

Ammermann, P.A. and Patterson, D.M. 2003. The cross-sectional and cross-temporal universality of nonlinear serial dependencies: evidence from world stock indices and the Taiwan Stock Exchange. *Pacific-Basin Finance Journal* **11**: 175-195.

Annuar, M.N., Ariff, M. and Shamsher, M. 1991. Technical analysis, unit root and weak-form efficiency of the KLSE. *Banker's Journal Malaysia* **64 (April)**: 55-58.

Annuar, M.N., Ariff, M. and Shamsher, M. 1993. Weak-form efficiency of the Kuala Lumpur Stock Exchange: an application of unit root analysis. *Pertanika Journal of Social Sciences and Humanities* **1**: 57-62.

Barkoulas, J. and Travlos, N. 1998. Chaos in an emerging capital market? The case of the Athens Stock Exchange. *Applied Financial Economics* **8**: 231-243.

Barnes, P. 1986. Thin trading and stock market efficiency: the case of the Kuala Lumpur Stock Exchange. *Journal of Banking Finance and Accounting* **13**: 609-617.

Brock, W.A., Dechert, W.D. and Scheinkman, J.A. 1987. A test for independence based on the correlation dimension. Working paper. University of Wisconsin, University of Houston, and University of Chicago.

Brock, W.A., Dechert, W.D., Scheinkman, J.A. and LeBaron, B. 1996. A test for independence based on the correlation dimension. *Econometric Reviews* **15**: 197-235.

Brock, W.A., Hsieh, D.A. and LeBaron, B. 1991. *Nonlinear dynamics, chaos, and instability: statistical theory and economic evidence*. Cambridge: MIT Press.

Brooks, C. 1996. Testing for non-linearity in daily sterling exchange rates. *Applied Financial Economics* **6**: 307-317.

Brooks, C. and Hinich, M.J. 1998. Episodic nonstationarity in exchange rates. *Applied Economics Letters* **5**: 719-722.

Brooks, C. and Hinich, M.J. 1999. Cross-correlations and cross-bicorrelations in Sterling exchange rates. *Journal of Empirical Finance* **6**: 385-404.

Brooks, C., Hinich, M.J. and Molyneux, R. 2000. Episodic nonlinear event detection: political epochs in exchange rates. In *Political complexity: political epochs in exchange rates*, ed. D. Richards, pp.83-98. University of Michigan Press.

Fama, E.F. 1965. The behavior of stock market prices. *Journal of Business* **38**: 34-105.

Fama, E.F. 1970. Efficient capital markets: a review of theory and empirical work. *Journal of Finance* **25**: 383-417.

Hinich, M.J. 1982. Testing for gaussianity and linearity of a stationary time series. *Journal of Time Series Analysis* **3**: 169-176.

Hinich, M.J. 1996. Testing for dependence in the input to a linear time series model. *Journal of Nonparametric Statistics* **6**: 205-221.

Hinich, M.J. and Patterson, D.M 1985. Evidence of nonlinearity in daily stock returns. *Journal of Business and Economic Statistics* **3**: 69-77.

Hinich, M.J. and Patterson, D.M. 1995. Detecting epochs of transient dependence in white noise. Mimeo. University of Texas at Austin.

Hsieh, D.A. 1989. Testing for non-linearity in daily foreign exchange rate changes. *Journal of Business* **62**: 339-368.

Hsieh, D.A. 1991. Chaos and nonlinear dynamics: application to financial markets. *Journal of Finance* **46**: 1839-1877.

Ko, K.S. and Lee, S.B. 1991. A comparative analysis of the daily behavior of stock returns: Japan, the U.S and the Asian NICs. *Journal of Business Finance and Accounting* **18**: 219-234.

Kok, K.L. and Goh, K.L. 1995. *Malaysian securities market*. Petaling Jaya, Selangor: Pelanduk Publications.

Kok, K.L. and Lee, F.F. 1994. Malaysian second board stock market and the efficient market hypothesis. *Malaysian Journal of Economic Studies* **31(2)**: 1-13.

Lai, M.M., Balachandher, K.G. and Fauzias, M.N. 2003. An examination of the random walk model and technical trading rules in the Malaysian stock market. *Quarterly Journal of Business and Economics* **41(1/2)**: 81-103.

Laurence, M. 1986. Weak-form efficiency in the Kuala Lumpur and Singapore stock markets. *Journal of Banking and Finance* **10**: 431-445.

Liew, V.K.S., Chong, T.T.L and Lim, K.P. 2003. The inadequacy of linear autoregressive model for real exchange rates: empirical evidence from Asian economies. *Applied Economics* **35**: 1387-1392.

Lim, K.P. and Tan, H.B. 2003. Episodic non-linearity in Malaysia's stock market. Proceedings of the 1st International Conference of the Asian Academy of Applied Business 2003, 10-12 July 2003, Sabah, Malaysia, pp.314-323.

Lim, K.P., Habibullah, M.S. and Lee, H.A. 2003a. Non-linear dependence in Malaysia's stock market. Proceedings of the National Conference on Management Science and Operations Research 2003, 24-25 June 2003, Melaka, Malaysia, pp.169-183.

Lim, K.P., Habibullah, M.S. and Lee, H.A. 2003b. A BDS test of random walk in the Malaysian stock market. *Labuan Bulletin of International Business and Finance* **1**: 29-39.

McMillan, D.G. and Speight, A.E.H. 2001. Nonlinearities in the black market zloty-dollar exchange rate: some further evidence. *Applied Financial Economics* **11**: 209-220.

Opong, K.K., Mulholland, G., Fox, A.F. and Farahmand, K. 1999. The behavior of some UK equity indices: an application of Hurst and BDS tests. *Journal of Empirical Finance* **6**: 267-282.

Patterson, D.M. and Ashley, R.A. 2000. A nonlinear time series workshop: a toolkit for detecting and identifying nonlinear serial dependence. Boston: Kluwer Academic Publishers.

Saw, S.H. and Tan, K.C. 1989. Test of random walk hypothesis in the Malaysian stock market. *Securities Industry Review* **15(1)**: 45-50.

Scheinkman, J. and LeBaron, B. 1989. Nonlinear dynamics and stock returns. *Journal of Business* **62**: 311-337.

Steurer, E. 1995. Nonlinear modeling of the DEM/USD exchange rate. In *Neural networks in the capital markets*, ed. A.P. Refenes, pp.199-211. New York: John Wiley & Sons.

Yong, O. 1989. The price behaviour of Malaysian stocks. *Malaysian Management Review* **24(3)**: 23-34.

Yong, O. 1993. Market efficiency (weak-form) of the Malaysian stock exchange. In *Understanding the behavioural patterns of stock prices: a collection of readings on selected far eastern stock markets*, eds. I. Ibrahim and O. Yong, pp.73-95. Kuala Lumpur: Leeds Publications.

Corporate Governance Practice of Labuan Offshore Companies:
A Comparative Study between Offshore Banks and Insurance Companies

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ABSTRACT

A much better understanding of corporate governance practices in financial institutions is of particular concern to investors and regulators. From the perspective of agency and institution, corporate governance addresses policies and procedures to protect shareholders' interest. The aim of this study is to analyze the influence and relationship of factors towards the corporate governance practices of Labuan offshore companies for the year of 2003. With offshore banks and insurance companies as the focus, we tested several hypotheses using survey data. Despite a relatively small sample size, only one corporate governance attribute namely the roles of the executive and non-executive directors was found to have a significant influence towards the company's accountability for offshore banks. However, for offshore insurance companies, corporate disclosure rules and regulations; director's qualifications and experiences; and audit committee effectiveness were found to be the key factors to improve the current corporate governance regime. Overall, these findings suggest that effective corporate governance is crucial to a firm's performance.

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INTRODUCTION

> *"Corporate governance is the process and structure used to direct and manage the*
> *business and affairs of the company towards enhancing business prosperity and*
> *corporate accountability with the ultimate objective of realizing long term shareholder*
> *value, whilst taking into account the interests of other stakeholders."*
> *– Malaysian Code on Corporate Governance, March 2000.*

In today's world, corporate governance is at the core of the process of directing a company. Davies (1999) revealed that it provides the leadership, values together with checks and balances needed to ensure survival. An important point here is that good governance is an aid to effectiveness which is not to shackle any company but to harness and harmonize them in the achievement of its goals. The 1997 Asian financial crisis for example, have created pressure to the market players namely the governments, corporations and financial institutions to improve their performance through greater commitment. As mentioned by Naik (1997), financial markets and institutions, play an important social and economic role that has a profound influence on the quality of investment decisions and the well being of the general economy. Thus the shareholder value and its relationship with business performance and corporate governance have become a major concern for today's companies.

In this paper, we examine the relationship of attributes of effective corporate governance practice towards Public Listed Company's (PLC) accountability focusing on two financial institutions; the offshore banks and insurance companies situated in Labuan. Elements to be studied from the managerial level perspective comprise of rules and regulations disclosure practice, roles and responsibilities, academic and experience background of directors, auditors' roles, audit committee effectiveness and the effect of nomination and remuneration committee. We will also discuss the impact of authorities' role and further improvement on this subject.

REVIEW OF THE LITERATURE

Sir Adrian Cadbury once notes that the foundations of good governance are disclosure or transparency and the presence of independent outsiders, which in the long run may form the basis for strong public confidence in any institution. Together it builds up the ethical standards for a lasting governance system.

Corporate governance is an increasingly popular topic among directors, institutional investors, legislators and regulators, managers and academics. The systems help determine how decisions are made about spending resources on building organizational capabilities, and how management and employees are evaluated and compensated. It is also able to recognize the inherent conflict among objectives of owner-shareholders and managers, and establish institutions, policies and procedures to protect shareholders' interests (McCarthy & Puffer, 2002a). However in the last few years, most participants in the corporate governance debates have discredited that corporations should be run in the interests of all of the stakeholders, rather than just for the shareholders (Blair, 1995). Referring Hansmann and Kraakman (2000) notion of 'The end of History of Corporate Law', they argue that a global consensus has now emerged when 'corporate managers should act exclusively in the economic interest of shareholders' and as a result, all jurisdictions will inevitably move towards the outsider model of corporate governance'.

Banks, corporation and government have close relationships in many Asian countries. Claims that corporate governance system (mainly in the financial industry) is undergoing convergence have intensified in the wake of the Asian crisis. Hamid Mehran of Federal Reserve Bank of New York highlighted that during times of crisis, banks provide liquidity and maintain deposits supported by government insurance. Scholars too have argued that large, short-term internal and external debts and openness of many East Asian economies, constrain the monetary and exchange rate policies. It is also due to inappropriate macroeconomic policy during the 1990s that have been made worse by inefficient management of initial depreciation in 1997 (Corsetti et al., 1998). In order for these countries to resume sustained high growth, they need to improve corporate governance (McKinsey, 1998). Thus, changing corporate governance practice, is a long-term process and may have to establish fundamental cultural and institutional changes if needed (Iskander et al., 1999). For example, governments of East Asian crisis countries are becoming owners of substantial assets (through takeovers of insolvent banks and asset-management companies) and consolidation of the banking industry have gain extra attention to maximize the shareholder wealth. Further reported by McKinsey Quarterly (2004), in Thailand, various firms inclusive of asset-management and life insurance companies have formed the Institutional Investor Alliance while in Singapore, the Securities Investors Association works together with companies to promote better corporate governance.

ATTRIBUTES OF CORPORATE GOVERNANCE PRACTICE

Although the concept of accountability, transparency, responsibility, disclosure, honesty and integrity are all closely related with corporate governance practice, it however only relies on the company's compliance rather than enforcement by way of law (Black & Kraakman, 1996). According to Fama and Jensen (1983), both internal and external governance elements are designed to minimise divergence, which arise from the separation of ownership and decision control.

Rules and regulations disclosure practice: To improve transparency by increasing disclosure requirements and auditing practices, most Asian countries (mainly Malaysia, China, Philippines, Singapore and Thailand) are gradually harmonizing its national financial-reporting standards with international standards. These countries are now requiring quarterly reporting to enhance transparency to all the parties involved. Management, the agent whom shareholders entrusted control over a portion of their resources (Watts & Zimmerman, 1979), have incentives to disclose favorable and also unfavorable information to the shareholders. Information disclosure besides reporting financial statement status may also include articulation of long-term strategy, non-financial indicators, and leading indicators and future profits (Kee & Pillay, 2002). One way to convey relevant information is to produce quality Corporate Annual Reports (CARS); a communication tool, which have direct influence towards accountability (Razman & Iskandar, 2002). To date, CARS have been constantly updated due to rapid changing demands from numerous regulatory bodies and to increase its reliability towards the public.

Director's roles, responsibilities, qualifications and experiences: The reformation of corporate practice will involve issues such as the composition of boards, how board members are appointed, how many truly independent board members are appointed, and how boards function. These issues are particularly crucial to address due to the domination of many boards by strong owner-managers (Fung, 2001). Most companies from various industries have boards on which all or a majority of non-executive directors are independent. The larger the company's size, the more likely it may have three or more independent non-executives. Although director's delegate most management and control function to the company's top management, they must have ultimate control over top management, which covers monitoring important decisions. This is further explained by acknowledging an important factor in creating a board, which compose both management (inside) and non-management (outside) members to support the board's effectiveness in monitoring management (Fama & Jensen 1983; Kosnik, 1987; Mallette & Hogler 1995; Beasley, 1996). Information advantages because of internal mutual monitoring will assist the board in decision-making, thus it is natural for the most influential board

members to be the internal managers. The inclusion of non-management board of directors however will increase the ability to prevent financial statement fraud.

Auditors' roles: A study by Abdullah and Iskandar (2003) has demonstrated that independence and activeness, plays an important role when selecting good auditors. It is crucial since the right decision-making will enhance a corporation's economic status and resources. Other studies also conclude that auditor's competency and expertise, audit committee member's financial literacy and director's position in other companies may also influence the choices of auditors (Kalbers, et al., 1993; Braiotta, 1994; Abdullah & Al-Murisi, 1997; DeZoort 1998; Abbot & Parker, 2000). As reported by earlier studies (Kunitake, 1981; Eichenseher & Shields, 1985; Cottell & Rankin, 1988; Apostolou & Jeffods, 1990; Craswell et al. 1995), the right selection of external auditors will assist better financial reporting disclosure and thus improve the audit service quality.

Audit committee effectiveness: Audit committee is a voluntary monitoring mechanism employed in a high stake agency cost situations with an objective to improve the information flow quality between both principle and agent (Pincus et al. 1989). They have become a vital link between external and internal auditors when reviewing the effectiveness of any company's internal controls thus increase the corporate accountability framework (Braiotta, 1994). Several prior researches have applied agency theory to examine the audit committee's role in monitoring management's selection of significant accounting policies that affects financial reporting reliability (Campbell et al. 1982; Mc Mullen 1992; Collier 1993; Henry et al. 1994). Results of some previous studies report the expectation that the board of director's composition (Watts, 1997; and Beasley, 1996) and the presence of audit committee (Campbell, 1982; Brown and Sarah, 1990; Henry et al., 1994) were connected to the board's effectiveness at reducing financial statement fraud and agency costs. Thus their presence increases public confidence on the credibility of financial statement disclosure.

Nomination & remuneration committee: Although the nomination and remuneration committee is not a must, it could be a good practice in particular to make recommendation on all new board appointments (OECD, 1998). However, exception can be given to board with smaller size. To prevent moral hazards, the Cadbury Committee and the Greenbury Committee have strongly emphasized that majority of the committee should be non-executive directors although not necessarily independent (Parkinson & Kelly, 1999).

DATA AND METHODOLOGY

The Flemings Research (Global Emerging Markets, June, 1998) develops measure of corporate governance based on information disclosure, transparency of ownership structures, management and special groups' interest, adequacy of the legal system, board of company's independence, minority shareholder rights and enforcement of corporate standards. This measurement is based on a 5-point Likert scale, which tries to capture the extent of shareholder rights in practice. McCarthy and Puffer (2003) however, suggest a framework of corporate governance, which depicts four elements of environment (economic, technology, legal/political and social/cultural) and three-stakeholder group (internal, external and peripheral). Their entire framework is viewed as an interrelated system rather by individual role. The accountability of corporate governance practices constantly evolves to meet changing conditions thus there is no single universal model or a final structure of corporate governance that any country or corporation should emulate. Therefore in this study, the relationships between the attributes of corporate governance are diagrammed in Figure 1.

- DISCLOSE: Rules and regulations disclosure practice
- ROLES: Roles and responsibilities
  (Executive and non-executive directors)
- QUALIFY: Academic background and experiences
- AUDIT: Auditors' roles (internal and external)
- AUDITCOM: Audit committee effectiveness
- NOMREM: Nomination and remuneration committee

→ Labuan Off-Shore Banks and Insurance Companies' Accountability

Figure 1: Theoretical Framework
Research context: Labuan International Offshore Financial Centre (IOFC)

Labuan IOFC, an offshore centre that facilitates offshore financial services activities is rapidly expanding its cross-border transactions and performance with 4,065 offshore companies in operation. Today, the updated figure represents more than 70 companies with Labuan Offshore Financial Services Authority (LOFSA) assistance under the auspices of Bank Negara Malaysia.

Due to the encouraging economic environment in 2003, the offshore banking industry has recorded a profit of USD1.3 million which is a turnaround value from a loss of USD14,000 in the previous year. The offshore insurance industry also has been showing an overall growth of 4.0% in 2003 with 13 new licenses been registered. Indication by the Bank Negara Malaysia have proved that the total growth for the industry has increased by 30.4% to USD914 million (2003), compared with only USD701 million 2002. Table 1 and 2 below indicate important statistics to both the offshore bank and insurance industry.

Table 1: Offshore Banks – Key Data

	As at end of			2002	2003
	2001	2002	2003	%	Change
Number of Banks Licensed	54	54	56	0.0	3.7
Number of Banks in Operations	54	50	53	(7.4)	6.0
Total Deposits (USD million)	3,657.4	5,865.6	3,702.0	60.4	(36.9)
Malaysian Offshore Banks	1,545.1	3,919.0	2,308.5	153.6	(41.1)
Foreign Offshore Banks	2,112.3	1,946.6	1,393.5	(7.8)	(28.4)

Source: Bank Negara Malaysia, 2003

Table 2: Offshore Insurance – Number of Insurance and Insurance Licenses

Type of License	2001	2002	2003
Life	2	2	2
General	3	4	4
Composite	1	2	2
Reinsurance	22	20	23
Captive	19	21	23
Total	47	49	54

Source: Bank Negara Malaysia, 2003

Arising from the needs to improve corporate governance practice system and structure, the Labuan Offshore Securities Industry (Amendments) Act 2003 (LOSIA) and Anti-Money Laundering (Bank Negara Annual Report, 2003) were recently established to enhance the regulatory and supervisory practice in Labuan IOFC. Thus, Labuan IOFC was chosen as the research focus for this empirical study with the intention to better understand the relationship between corporate governance attributes and firm's accountability.

Research design: In this study, we distributed and analyzed primary data using surveys on a seven point Likert scale. Several questions were adopted from the study conducted by Bursa Malaysia (formerly KLSE)/Pricewaterhouse Coopers and earlier study by Wafa et al. (2001). The primary criteria for selecting respondents to participate are (1) current involvement with either bank or insurance business at managerial level, (2) have gone through formal education and/or professional training and (3) have a number of years of experience in accounts, corporate finance and/or legal sectors. We also assume that the respondents have basic knowledge on corporate governance practices. The Cronbach alpha for the variables obtained, ranged from 0.68 to 0.96 that indicate acceptable reliability.

EMPIRICAL RESULTS

Completed surveys were collected from 25 offshore banks and 12 insurance companies yielding an overall response rate of thirty seven percent from 100 firms. Most of the offshore bank respondents were more than 34 years of age (76%) compared to 66 percent in the offshore insurance. A majority of the respondents for both banks (66%) and insurance companies (58.3%) have more than 10 years of working experience. Grouping them according to professional training area, for offshore banks the respondent focuses in accounting (28%), business administration (20%), finance (20%), law (16%). Offshore insurance recorded 16.7 percent in accounting, 8.3 percent in business administration, insurance and law respectively. For offshore banks the proportion of respondents working for companies in the Public Listed Company (PLC) category was 40 percent. Insurance companies however recorded a slightly higher percentage (i.e. 50 percent).

The descriptive statistics for this study are shown in both Table 3 (offshore banks) and Table 4 (offshore insurance companies).

Table 3: Offshore Bank's Descriptive Statistics and Correlation Analysis

No	Variable	Mean	Standard deviation	1	2	3	4	5	6	7
1	CORPGOV	5.87	1.00	1.00						
2	DISCLOSE	5.56	1.29	0.66**	1.00					
3	ROLES	5.18	1.06	0.63**	0.82**	1.00				
4	QUALIFY	5.57	1.10	0.64**	0.70**	0.61**	1.00			
5	AUDIT	5.46	1.09	0.54**	0.68**	0.80**	0.41*	1.00		
6	AUDITCOM	5.02	1.12	0.45*	0.65**	0.78**	0.43*	0.79**	1.00	
7	NOMREM	4.64	1.37	0.32	0.51**	0.78**	0.41*	0.57**	0.71**	1.00
8	OVERALL	5.24	0.98	0.64**	0.86**	0.95**	0.70**	0.84**	0.87**	0.80**

** *p < 0.01*
 * *p < 0.05*

Table 4: Offshore Insurance's Descriptive Statistics and Correlation Analysis

No	Variable	Mean	Standard deviation	1	2	3	4	5	6	7
1	CORPGOV	5.36	1.00	1.00						
2	DISCLOSE	5.08	1.13	0.88**	1.00					
3	ROLES	4.92	1.05	0.66*	0.82**	1.00				
4	QUALIFY	5.17	0.80	0.76**	0.47	0.48	1.00			
5	AUDIT	4.75	1.14	0.61*	0.84**	0.88**	0.18	1.00		
6	AUDITCOM	4.96	0.87	0.84**	0.73**	0.40	0.47	0.54	1.00	
7	NOMREM	4.71	0.75	0.42	0.37	0.49	0.29	0.60*	0.47	1.00
8	OVERALL	4.93	0.76	0.88**	0.92**	0.87**	0.58*	0.89**	0.75**	0.65*

** *p < 0.01*
 * *p < 0.05*

The correlation analysis results for the offshore banks and insurance companies indicate that the overall rules and regulations disclosure mean values are 5.56 and 5.08 respectively. The findings also indicate that the executive and non-executive directors are fully aware of their roles and responsibilities with mean showing 5.18 for banks and a slightly lower for insurance at 4.92. A more detailed analysis of the second variable too provides evidence that the respondents agree with non-executive directors having served a useful purpose as discussion confidants. From both perspectives, the respondents further acknowledge the importance of executive directors' qualification and experience with mean reflected at 5.57 and 5.17 accordingly. The roles of external and internal auditors score 4.75 for insurance companies while banks record a slightly higher value at 5.46 for the same analysis. Table 3 and 4 also display that the audit committee are perceived to have effectively discharged their duties and responsibilities with means of 5.02 and 4.96 respective to Labuan offshore banks and insurance companies. This finding is also consistent with the perception given by the respondents, which states that a majority of the audit committee members should be non-executive directors. Although the nomination and remuneration committees are quite rare in most companies, the mean values are equivalent to 4.64 and 4.71 for banks and insurance companies, which still proves the importance of establishing this committee. Comprehensively, corporate governance standards are perceived to be quite highly related with the companies' accountability. The overall results indicate offshore banks with a mean of 5.24 while offshore insurance companies recorded 4.93, which is slightly above midpoint.

Table 3 also shows that there were quite large and significant positive inter-correlations between the tested variables for offshore banks. Insurance companies however, identify a slightly lower number of positive inter-correlation amongst variables at significant level of 1 percent or 5 percent. Remarkably in both tables, the business sectors recorded similar results on identifying five of the six variables (with the exception of the Nomination and Remuneration Committee) to be significantly correlated with the companies' accountability. These results however are quite conflicting with values from the regression analysis in Table 5.

Table 5 Regression analysis on Corporate Governance Practice – The Step-Wise Method

Variable	Bank				Insurance			
	Beta	t-value	Sig T	VIF	Beta	t-value	Sig T	VIF
DISCLOSE	0.15	0.63	0.534	3.67	0.41	*6.09*	*0.000*	2.25
QUALIFY	0.04	0.19	0.854	2.35	0.50	*6.72*	*0.000*	1.34
AUDITCOM	-0.10	-0.63	0.535	1.74	0.37	*4.14*	*0.003*	2.27
ROLES	0.34	*2.86*	*0.009*	1.30	-0.21	-2.24	0.060	4.91
AUDIT	0.01	0.06	0.951	1.72	-0.13	-1.22	0.262	4.34
NOMREM	-0.04	-0.22	0.825	1.93	-0.02	-0.42	0.688	1.29
R^2	0.68				0.98			
Adjusted R^2	0.65				0.97			
F-Statistics	22.91				34.82			
Sig F	0.00				0.00			
Condition Index	14.87				21.985			
Durbin Watson	2.74				1.66			

 In Table 5 through the application of step-wise regression, all the independent variables are significant as indicated by the F-values for both the offshore banks and insurance companies. From the study, 68% of the banks dependent variable (accountability of offshore banks) as reflected by the R^2, can be explained by the independent variables. The analysis of insurance companies anyway, recorded a much higher value at 98%. In sum, the accountability of both sectors being influenced by the independent variables or at least one of the independent variables is highly significant. The study shows no serial correlation evidence as the Durbin Watson statistics is within acceptable range and both Condition Index estimates are below the rule-of –thumb cutoff of 30. Here, we also investigate any potential multicollinearity problems by examining the variance inflation factors (VIFs) and the results from Table 4 are clear for the sectors where VIF values are also well below the cutoff point. Thus we can conclude that the regression estimates for the variables were not adversely affected by the presence of multicollinearity problems.

As described in earlier paragraph, by comparing the actual five variables (through correlation analysis) that are significantly related towards the accountability of Labuan offshore banks and insurance companies, the regression analysis results in Table 5 however, indicates that for offshore banks only one was significant that is the roles and responsibilities of the executive and non-executive directors (0.34). Insurance companies on the other hand recorded three variables which were found significant namely rules and regulation disclosure practice (0.41); academic background and experience of executive and non-executive directors (0.50); and audit committee effectiveness (0.37).

DISCUSSION AND IMPLICATIONS

Rules and regulations disclosure practice

The regression score in Table 5 showing insignificant result of the offshore banks' rules and regulations disclosure practice could be attributed to the perception of banks that they are free from detection and this could be a sign of lack of enforcement in the Labuan IOFC. For instance, upon issuance of banking operation license, the offshore banks should abide to certain rules by LOFSA such as to comply with prudential and reporting requirements. However in this case, the respondents perceived that the enforcement is not sufficient. This differs from the result for insurance companies, which show significant relationship between disclosure practices towards the firm's accountability. Thus, the finding is more adequately adhered to theories supporting disclosure actions. For this entity, the respondents confirm that insurance companies have disclosed enough information especially matters regarding directors' dealing and business transactions.

Nevertheless in any situation, both banks and insurance companies ought to conduct business with sound principles and due diligence. This can be achieved by maintaining adequate and proper records of financial statement, statistics and information (LOFSA, 2001). Mitton (2002) found that firms with higher disclosure quality, greater transparency and corporate focus will experience better stock price especially during economic crisis. Recalling Razman and Iskandar (2002), an alternative way of conveying relevant information is to produce quality Corporate Annual Reports (CARS); a communication tool, which have been proven to have a direct relationship with accountability.

Roles and responsibilities (executive and non-executive directors)

Focusing on offshore banks' operation, the findings of this study are consistent with Demsetz (1995), who highlights that the larger and more complex an organization, the more is demanded of the top management. Furthermore, the value of written corporate governance guidelines or framework is becoming more apparent to boards in bigger firms today although the production of such a "board constitution" is in itself a major governance task. The findings related to offshore bank is also consistent with Brook et al. (2000), who suggest that board ownership particularly outside directors can play an important role in effective corporate governance. It can also be described by the facts that for offshore banks, prior written approval from LOFSA must be obtained for the appointment of a controller or director. This justifies and strengthens the significant role played by this attribute towards offshore banks' accountability. As for insurance companies, the insignificant value could be its directors' roles and responsibilities are not specifically stated (particularly the non-executive directors), which may lack meaning and practicality. Moreover, because of its smaller entity, the directors may also only act as fiduciaries to the firms' strategic operations (Kang & Sorensen, 1999).

Academic background and experiences

Director's expertise can often be enhanced through participation in a firm's governance structure for instance by serving on the board of directors, observing company's operation and contributes toward strategic decisions. Owners with strong qualifications and relevant experience are likely to incorporate well-informed discussion with the managers (Beasley, 1996). However, no significant relationship is found between the importance placed on the offshore banks directors' academic background and experiences, and the assessed offshore banks' accountability. In actual fact, usually the appointed directors are assisted by senior and professional management team during its day-to-day operations (Fama & Jensen, 1983; Wafa et al, 2001). Different conclusion was obtained for the offshore insurance, which shows a significant result. The reason is, offshore insurance companies are more restricted to LOFSA's rigorous prior approval requirements and standards (LOFSA, 2001). The steps taken are vital to guarantee the best selection of qualified, fit and proper directors. Besides that, due to its smaller size compared to offshore banks, the daily business routine and transaction are normally being observed individually by the appointed directors (note: at least one director resident in Labuan).

Auditors' roles (internal and external)

Auditors should realize its role to have proper reporting and disclosure particularly on all accounting procedures carried out by the offshore companies. However, the regression analysis indicates that both offshore banks and insurance companies have similar insignificant relationship of the attribute towards the accountability level. This explains that the internal and external auditors have been regarded to not perform their roles independently and in accordance with the statutory and professional requirement. Thus, discharging their duties and responsibilities less effectively. One reason, which perhaps influence this peripheral is the respondents' perceived feelings that the appointed internal auditors (whom at the same time are also the company's employees) and external auditors may provide non-audit services such as book keeping to their existing clients. For this reason, any accuracy on financial reporting and disclosure practice may fall far short of its main objectives.

Audit committee effectiveness

Audit committee is a necessary component of the financial reporting process and serves to deter fraudulent financial reporting thus enhancing more reliable information to be disclosed to the shareholder. Another function of audit committee is to provide private access to the directors for auditors (external and internal) if critical matters cannot be properly resolved through normal channels (Collier, 1993). Significant relationship between audit committee effectiveness and the accountability of offshore insurance companies justifies the respondents' agreement that the audit committees have efficiently discharged their duties and responsibilities.

However, conflicting result in Table 5 indicates no significant relationships were found between audit committee effectiveness towards the offshore banks' accountability. The answer to this scenario may be focused on the normal practice of the committee composition of non-executive directors. Wafa et al. (2001) in their earlier study have underlined one important justification on this matter; selection of the audit committee members may perhaps be done on the basis of being 'old-boys' which shows that the selections were not based on expected benefits and contributions. Hence jeopardizing the non-executives underlying principle; 'independent of management' and 'free from any business or other relationship that may materially interfere with the exercise of independent judgment' (Cadbury Committee).

Nomination and remuneration committee

Most firms seldom establish nomination and remuneration committee, thus the respondents can gather insufficient knowledge about it. This may perhaps justify why the nomination and remuneration committee is insignificant towards the accountability for both the offshore banks and insurance companies. The findings are consistent with Wafa et al. (2001) in their study on Malaysia PLCs' accountability. Even though the committees are quite rare or under utilized, earlier correlation analysis results in Table 3 and 4 show that the mean statistical values are slightly above midpoint. This justify why most respondents agree that the committee can be a good mechanism to ascertain that the companies' operations will be in better shape thus enhancing the overall performance. Hence, both industries should consider the recommendation made by the Cadbury Committee, the Greenbury Committee and the Hampel Committee that highlights the outstanding roles by above-mentioned committee to ensure transparency in the appointment of directors and fair determination of directors' salaries.

Overall, what is clear is that although the findings are tentative due to the small sample size, the study still supports future reformation and calls to enhance the current corporate governance regime in Labuan IOFC, particularly the offshore banks and insurance companies.

CONCLUSIONS

As a general guideline, both offshore banks and insurance companies must subscribe to safeguards and comply with standards by the relevant authority for instance management control system and adequacy of capital (LOFSA, 2001). For instance, certain actions including change of business plan must first be approved by LOFSA. Hence, the challenge lies with the policymaker (under the auspices of the Central Bank) to exercise comprehensive reform with equitable burden sharing among external participants (borrowers, equity holders, creditors and government) and internal parties (shareholders and workers). This is vital to restore confidence in the offshore financial system and positively lead to a more competitive financial and corporate system. This reduces default risk and minimizes the chances of a crisis.

 Shareholder value; strategic improvement; director activism; board independence; management partnership; shared decision-making; evaluation and improvement; these elements have been identified as the benefits to be gained from an improved corporate governance regime a practice. A lack of information is a huge issue and the board must really encourage the management to bring forward solid information especially on the strategic positioning of both offshore banks and insurance companies. In return the shareholder's value will definitely maximize if each and every director were well informed and work well. Corporate governance practices vary and will continue to vary across nations and cultures. Furthermore, it may also be different as a function of ownership structures, business circumstances, competitive conditions, company's life cycle and other factors (McCarthy & Puffer, 2003). All institutions need an improved framework of clear governance; comprising missions to be accomplished stated with clear rules and authorized conventions in order to guide its accomplishment. Hence throughout the years of awakening economy, corporate governance is no longer optional for any institutions – it is now a vital issue.

Corporate governance arrangements influence the efficiency use of society's resources and the firm's ability to create new wealth. It should also take into consideration the risk, rewards, incentives and motivations facing other stakeholders. As mentioned by Blair (1995), contractual arrangements and governance systems should be devised to assign control rights, rewards and responsibilities to the appropriate stakeholders – the parties that contribute specialized inputs to the company. For the sake of shareholders wealth, one notion is crucial; the better a firm's performance and control, the less severe the agency problems.

REFERENCES

Abbott, L.J., & Parker, S. (2000). Auditor selection and audit committee characteristics. *Auditing: A Journal of Practice & Theory. 19*(2) p47-66.

Abdullah, S.N., & Al-Murisi, M.A.L.S. (1997). Perceived audit committee effectiveness in Malaysia. *Malaysian Management Review*. p4-42.

Abdullah, W. Z., & Iskandar, T. (2003). The role of audit committee in the selection of external auditors: The Malaysian evidence. *The 1st International Conference of the Asian Academy of Applied Business*. Sabah, Malaysia. p33-43.

Apostolou, B., & Jeffirds, R. (1990). *Internal audit briefings: Working with the audit committee*. The Institute of Internal Auditors. Florida.

Beasley, M.S. (1996). An empirical analysis of the relation between the board of directors composition and financial statement fraud. *The Accounting Review*. Vol 71.

Black, B., & Kraakman, R. (1996). A self-enforcing model of corporate law. *Harvard Law Review.*

Blair, M.M. (1995). Toward a new view of corporate goals and governance. *Ownership, and control: Rethinking corporate governance for the twenty-first century.* Washington, DC: Brookings.

Braiotta, L. (1994). *The audit committee handbook.* John Wiley & Sons, Inc. New York.

Brook, Y., Hendershott, R.J., & Lee, D. (2000). Corporate governance and recent consolidation in the banking industry. *Journal of Corporate Finance. 6* p141-164.

Brown & Sarah (1990). Voluntary disclosure of financial segment data: New Zealand evidence. *Accounting and Finance.* May.

Campbell, W., & McNeil (1982). An empirical examination of the relationship between audit committees and the displacement of accounting firms. *Phd. Thesis.* University of North Texas.

Collier, P.A. (1993). Audit committee in major UK companies. *Managerial Auditing Journal. 8*(3) p25-30.

Corsetti, G., Pesenti, P., & Roubini, N. (1998). What caused the Asian currency and financial crisis? Unpublished working paper, New York University, New York.

Cottell, G.P., & Rankin, J.L. (1988). Do audit committee bias selection? *Akron Business and Economic Review. 19*(4) p87-101.

Craswell, A.T., Francis, J.R., & Wong, T.J. (2000). Auditor industry specialization and market segmentation: Evidence from Hong Kong. *Auditing: A Journal of Practice and Theory. 19*(1) p 49-66.

Davies, A. (1999). *A strategic approach to corporate governance.* England: Gower Publishing Limited.

Demsetz, H. (1995). Management compensation and tournament theory. *The Economics of the Business Firm.* Cambridge Univ. Press, Cambridge.

DeZoort, F.T. (1998). An analysis of experience effects on audit committee members' oversight judgments. *Accounting, Organizations and Society. 23*(1) p1-21.

Eichenseher, J.W., & David, S. (1985). Corporate director liability and monitoring prefenrences. *Journal of Accounting and Public Policy. 4*(1) p13-31.

Fama, E.F., & Jensen, M.C. (1983). Separation of ownership and control. *Journal of Law and Economic. 883* p288-301

Hansmann, H., & Kraakman, R. (2000). The end of history of corporate law. *Working paper CLB 99-013.* New York University center for Law and Business.

Henry, Eleanor & Gail (1994). Owner versus management control of audit committee in reporting policies (owner control). *PhD Thesis.* Saint Louis University.

Iskander, M., Meyerman, G., Gray, D.F., & Hagan, H. (March, 1999). Corporate restructuring and governance in East Asia. *Finance & Development. 36* p42(4).

Jensen, M., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics. 3* p305-360

Kalbers, L.P., & Forgarty, T.J. (1993). Audit committee effectiveness: An empirical investigation of the contribution of power. *Auditing: A Journal of Practice & Theory. 12*(1) p24-40.

Kee, P.L., & Pillay, S.S. (2002). Corporate voluntary disclosure in annual reports by Initial Public Offerings of Malaysian Companies. *The Fourth Annual Malaysian Finance Association Symposium Proceedings.* Penang. Malaysia. p115-129.

Kosnik, R.D. (1987). Greenmail: A study of board performance on corporate governance. *Administrative Science Quarterly. 32* p163-185.

Kunitake, W.K. (1981). An investigation of the relationship between establishment and existence of audit committee and selection of auditors. Unpublished dissertation. University Microfilms International.

Mallette, P., & Hogler, R.L. (1995). Board composition, stock ownership and the exemption of directors from liability. *Journal of Management. 21*(5).

McCarthy, D.J., & Puffer, S.M. (2002a). Corporate governance in Russia: Towards a European, U.S. or Russian model. *European Management Journal. 20*(6) p630-640.

McCarthy, D.J., & Puffer, S.M. (2003). Corporate governance in Russia: A framework for analysis. *Journal of World Business. 38* p397-415.

McKinsey, & Co. (1998). *Responding to the economic crisis in South East Asia: Risks and opportunities for multinational corporations.* Discussion documents, April.

Mitton, T. (2002). A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis. *Journal of Financial Economics. 64* p215-241.

Naik, N. (1997). The role of financial markets. *Mastering Management.* Financial Times.

Parkinson, J., & Kelly, G. (1999). The combined code on corporate governance. *The Political Quarterly Publishing.* Blackwell Publishers. Oxford, UK.

Pincus, K.V. Rusbarsky, M., & Wong, J. (1989). Voluntary formation of corporate audit committees among NASDAQ firms. *Journal of Accounting and Public Policy. 8* p239-265.

Razman, R., & Iskandar, M.T. (2002). The effectiveness of audit committee in monitoring the quality of corporate reporting. International Conference on Corporate Governance.

Wafa, S.A., Aik, O.F., Ahmad, Z.K., & Mohidin, R. (2001). Coporate governance of Malaysian public listed companies. *The 6th International Conference on Global Business & Economic Development*. Bratislava, Slovakia.

Watts, R.L., & Zimmerman, J.L. (1979). *Positive Accounting Theory*. Englewood Cliffs. Prentice Hall. USA

Factors Driving Electronic Commerce Initiative In Malaysian' Organization

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ABSTRACT

This study is trying to investigate major factors driving e-commerce adoption, and assess the organizational readiness for Malaysian companies operating in FIZ (Free Industrial Zone) in the state of Penang and Kedah. This study used structured questionnaires and a purposive judgmental sampling method in getting responses from IT managers or decision-makers on e-commerce initiative. Dependent variable is the organization readiness level in adopting e-commerce strategy and independent variables are online competitiveness, customer relationship management and value chain management. This study shows that Malaysian companies are lagging in e-commerce initiative compared to American companies, but Malaysian companies are on par with European and East Asian companies. It reflects the general views that e-commerce is "American Originated" technology and American companies have an edge in adopting this new and enabling technology to enhance their global competitiveness. The Malaysian companies have been proactively evaluating and embarking on IT projects to enhance their international competitiveness and they are on par with European and East Asian companies in e-commerce initiative. This study shows Online Competitiveness, Customer Relationship Management and Value Chain Management are affecting decision on e-commerce initiative. The results of this research will also serve as an initial feedback to Malaysian authorities to step up their efforts in promoting IT awareness, and adopting new and enabling technologies in Malaysian companies. It is also hoped that this study can provide a guideline for Malaysian companies in evaluating and formulating effective strategies and policies into e-commerce in this information age.

INTRODUCTION

Consider what tasks the company has to perform when an employee wants to buy something, for example, a filing cabinet. First the employee generates a request for the filing cabinet, including some specifications (four drawer vs five-drawer, with lock vs no lock), and passes this request on through an approval process involving one or more managers, depending on the cost. That request finally makes it over to the purchasing department, where someone has to check through the office supply catalogs to select an appropriate model and supplier. Assume the company doesn't have a single preferred supplier for office supplies, so the purchasing agent has to check more than one catalog and call the suppliers to determine the availability of the filing cabinet. Once the supplier is selected, the agent can issue a purchase order, and either fax or mail it to supplier.

Once the order has been received, the supplier verifies the credit and sales history of the ordering company, checks the warehouse for inventory, and finds out when shipper can pick up the cabinet from the warehouse and deliver it to the appropriate location. Satisfied with the item can be delivered within the time requested, the supplier creates a shipping order, notifies the warehouse, and creates an invoices for the filing cabinet. The invoice gets mailed, the filing cabinet gets delivered, and somewhere along the way, your company pays the bill for the cabinet.

Now consider how this might have been done using electronic commerce. The employee would visit the Web site of either the distributor or the manufacturer, and select the appropriate filing cabinet by matching the needs (colour, number of drawer, lock, size) with the data in an online catalog. The employee would then use electronic mail to send a digital request (perhaps appending the Web page of the selected product) to the manager for approval. Once approved, the manager would simply use e-mail to forward the request to purchasing. Purchasing could then copy the necessary information into their order database, and send an electronic order to the supplier, via EDI or other form, also using e-mail.

When the supplier receives the order, a computer program might automatically insert the order into a database of pending orders, check inventory at the warehouse, check your company's credit status, and earmark the item for delivery. The same program might then pass a shipping order electronically to appropriate warehouse and create an invoice. If a shipping agent is used, the warehouse would notify the shipper via e-mail. Once the filing

cabinet was received, accounts payable would instruct the bank, via e-mail, to transfer the appropriate funds to the supplier.

With electronic commerce, everything starts out and stays digital; only different applications are needed to transfer and process the data as it winds its way through the order process. Imagine how much more efficient this process would be if you were able to obtain all the information you needed right at your fingertips, and also make your purchases, all using one medium.

RESEARCH PROBLEM

The decision makers particularly the chief executive officers and chief financial officers in most organizations have difficulty in evaluating and adopting e-commerce strategy. In today's 'Networked Economy', where individuals and companies worldwide are being electronically linked, business rules keep changing and companies have to respond fast to changes to survive. Marketplace is changing every second at an increasing pace. E-commerce is increasingly crucial to business success, but implementing it successfully requires a broad understanding of technology, law, policy, and business processes. There are many factors affecting decision-making in adopting of E-commerce, the decision is complicated by the pace the Internet changes the business rules in the globalization age.

RESEARCH OBJECTIVES

Research in e-commerce in Malaysia is very limited and not widely published. This research is intended to study e-commerce initiatives for manufacturing companies operating in Free Industrial Zone (FIZ) in the state of Kedah and Penang. Specifically, the study is intended:
1. To investigate whether Malaysian companies are lagging in adopting e-commerce strategy compared to American, European and East Asian companies.
2. To study major factors driving decision making to adopt e-commerce strategy.

LITERATURE REVIEW

There are a variety of definitions of "electronic commerce" (e-commerce) in the literature. It has been defined as a combination of technologies (Electronic Commerce World Institute, 1996), as a business methodology (Kalakota & Whinston, 1996) and as business over networks and computers (Haynes, 1995).

Oracle Inc. defines e-commerce as a dynamic set of technologies, applications, and business processes that link enterprises, consumers, and communities through electronic transactions and the electronic exchange of goods, services and information (Internet Commerce, 1999).

For some time now, large business enterprises have used electronic commerce to conduct their business-to-business transactions. Electronic data interchange (EDI) on private networks began in the 1960s, and banks have been using dedicated networks for electronic fund transfer (EFT) almost as long. Recently, however, with the increased awareness and popularity of the Internet, electronic commerce has come to encompass individual consumers as well as business of all sizes (Kosiur, 1997).

The Internet is already changing the way that many companies conduct their business. As that influence grows, and more companies use the Internet, the possibilities for conducting business-to-business commerce on the Internet will expand greatly, and become more of a routine part of commerce than it is today.

To many, electronic commerce is defined as the buying and selling of products and services over the Internet, but there are many more aspects to it. From its inception, electronic commerce has included the handling of purchase transactions and funds transfers over computer networks. It is now grown to include the buying and selling of new commodities such as electronic information.

Over the past few years, both the press and business community have increased their focus on electronic commerce involving the consumer. Meanwhile business-to-business electronic commerce is rolling along, stronger than even ever. The Internet has also given business-to-business electronic commerce a boost – in some cases, smaller companies are now discovering that they can conduct business on line, just like their larger counterparts. And business of all sizes are finding that they can take advantage of the Internet to lower cost of electronic commerce – either by replacing other networks, or by using the Internet.

The move for business to digitize information isn't new – it's been going on for more than a decade, and continue to increase as personal computers become standard business equipment for more and more corporations. What is making a notable difference to businesses is that a significant synergy has formed between the use of digital information, computerized business practices, and the Internet. This synergy is what enables electronic commerce.

Forces Driving/Enabling E-Commerce

A study conducted by Anderson Consulting (1999) shows that there are four forces, as depicted in Figure 1, which drives or enables e-commerce, namely, business value, technology infrastructure, customer value and cooperative regulatory environment. Anderson Consulting predicts the electronic economy will overtake the traditional industrial economy by year 2003 (Anderson Consulting, 1999).

A reasonably favorable deregulatory environment increases the competitive tempo, which encourages businesses to seek means to obtain or retain a competitive advantage. Technology offers businesses new opportunities to enhance value to its customers, increase its efficiency and extend its reach. Consumers respond to the increased value by favoring these leading businesses. Thus rewarded, these businesses reward the technology providers with additional purchases. Consumers also favor governments trade liberalization, which has permitted and encouraged new value streams. Each circle of activity has been reinforcing the others (Anderson Consulting, 1999).

Figure 1: Four Forces Of Inevitability

Source: http://www.ac.com/ecommerce/ecom_what_is.html

In another study, conducted by a management consulting firm A.T. Kearney, sought the views of CEOs and senior business executives at 213 companies in 11 industries in more than 20 countries. The study shows nine out of 10 cited information technology (IT) as critical in every way or very important for their businesses' future success. One-third cited the use of new technologies as the top critical success factor for the future. 58% identified loss of competitive advantage as the main consequence of not keeping pace with IT (Saia, 1999). Information technology and Internet linkage are widely seen as the catalyst to propel the electronic commerce into every aspects of domestic and international trade.

Online Competitiveness

Whether leading the charge or tagging along one step at a time, companies today are moving inevitably towards a new commercial world order. Fundamental methods by which business is conducted will be forever changed as organizations use technology to link enterprises, consumers, and communities through electronic transactions and the electronic exchange of goods, services and information. "The Internet economy will have the same impact on society that the industrial revolution had 300 years ago", says John Chambers, the CEO of Cisco Systems (Internet Commerce, 1999).

In e-Commerce, coordination can be achieved virtually, at low cost. Whole supply chains can be forged quickly and connected through desktops. And whether the seller is really in Boston, its "warehouse" a totally different company in Topeka, and the payment processor still another firm in Bangladesh are considerations largely irrelevant to consumers as long as their expectations for quality, price and service are met. (Melnicoff, 1999)

Porter (1994) reported efficiencies generated by online commercial efforts on marketing on Web results in "10 times as many units [sold] with 1/10 the advertising budget". It is about one-fourth less costly to perform direct marketing through the Net than through conventional channels (Verity & Carey, 1994). This fact becomes

especially critical in the face of shortening technology and product life cycles and increasing technological complexity in the business arena of the globalization age. Using SunSolve Online, Sun Microsystems has save over US$ 4 millions in Frequently Asked Questions (FAQs), since Sun "reengineered information processing around the WWW" (Neece, 1995).

Web sites are available on demand twenty-four hours a day. The interactive nature of the Internet can be used by marketers to hold the attention of the customer, by engaging him or her in an asynchronous "dialogue" that occurs at both parties' convenience. This capability of the medium offers unprecedented opportunities to tailor communications precisely to individual customers, allowing them to request as much information as desired. Further, it allows the marketer to obtain relevant information from customers for the purpose of serving them more effectively in the future.

Value Chain Management

Communications and information technologies often make it more effective and less expensive to collaborate with outsiders than to own all the resources associated with your business. Although coordination and day-to-day control might be a little more difficult, organizations more than make up for the difficulty in quality, flexibility and cost. The result is that specialists are cropping up in practically every major business activity, from product design to delivery, and it's now possible to pull together a virtual organization that employs only "best-of-breed," cost-effective contributors at each points (Melnicoff, 1999).

Banks, consumer-packaged-goods companies, insurance providers, educational institutions, manufacturing firms, and health care providers are cutting the value chain and enhancing business relationship by utilizing the Internet and its offshoots, intranets and extranets (Internet Commerce, 1999).

Clearly, it is important for organization to focus on the part of the value chain most valued by customers and team up with the best for the rest. Specialized niche players or smarter, faster competitors will attack any weak parts of your value proposition and marketing position. If you're not the absolute best at performing a function that can be bought elsewhere, don't do it. (Melnicoff, 1999)

In the business-to-business arena, e-commerce strategies allow businesses to leverage electronic alliances to speed up the delivery of products and services to market. Companies set up electronic linkages to work more closely with their suppliers and save millions of dollars in inventory and distribution costs.

Internet-based procurement solutions leverage the Internet as a business and technology enabler, using workflow-driven process automation and supply-chain collaboration to streamline purchasing and reconcile payments. The procurement personnel can be deployed strategically for analysis and sourcing. By automating the generally paper-based procurement of maintenance supplies, office supplies, equipment, services, and the like, companies can realize substantial cost savings (Internet Commerce, 1999)

Customer Relationship Management

In order to be successful in the market–driven economy, customer satisfaction is the top priority for all organization. With greater reach of information through proliferation of Internet, global marketplace offers customers with unlimited choices of products and services. Customers demand instant access to product information, e.g. features and pricing, ease in ordering products and choices of payment methods.

Customers and suppliers who have embarked on e-commerce initiatives are beginning to demand their business partners to jump on their bandwagon to further streamline their business processes. In certain case, it has become mandatory for company to adopt and draw up a plan to embrace e-commerce in order to continue their business dealings or partnership.

Cisco has become a world leader in Internet commerce by winning customers with streamlined, self-service business processes. Unassisted Web sales account for roughly 73 percent of Cisco's $8.3 billion per year in orders. Customers and business partners also have direct access to technical support and order status information, saving Cisco $550 million annually while improving customer satisfaction (Internet Commerce, 1999).

Customer motivations can be examined in categories of benefits, rewards and relationships. Customer values can be examined in terms of an individual's value assessment of risk and benefit, particularly as those values relate to the use of electronic commerce technologies.

Bitner (1995) describes an encounter between a business and a customer and the associated relationship building around the concept of "promises". Bitner poses three components of promises: making promises; enabling promises; and keeping promises. The three components of promises translate roughly to the marketing, advertising, and sales functions; the electronic servicescape for direct customer interaction; and the fulfillment process and supporting infrastructure. Electronic commerce offers the opportunity for an entire transaction process - advertising, purchasing decision, and order fulfillment - to occur within one customer interaction at the electronic servicescape.

Stone (1994) describes "relationship marketing" not only as a benefit to a direct marketing industry company, but as a necessary condition to profitability. Stone recognizes that the first sale to a direct marketing customer is not profitable when considering all of the costs associated with obtaining that customer. Given that investment in obtaining a new customer, it is logical and essential to develop and maintain a long-term mutually beneficial relationship with that customer that results in repeat sales. This is the business rationale behind the practice of database marketing.

This recognition of relationships as a necessary foundation for profitability in an industry that has direct contact with individual customers is one of the reasons the catalog industry is considered a precursor of electronic commerce is because they have been doing this over the last two decades.

Electronic collaboration is the most important part of the business-to-business electronic relationships - two companies leveraging each other's information systems to enhance the overall customer experience. Thanks to the tight electronic links enabled by the Internet, global express-delivery company United Parcel Service (UPS) provides most of the shipping for the world's largest PC manufacturers. UPS is adding value to the business transactions to each of the major customers (Internet Commerce, 1999).

Once customers configure their orders for computers and peripherals, UPS and its partners coordinate the shipping activities for multiple locations, drastically reducing the manufacturers' inventory carrying costs and ensuring that all pertinent packages arrive at the customer's location on the same day. Customers can track their shipments through the UPS delivery network, using a single order number. Far beyond providing mere transportation services, UPS is a trusted partner, enabling these companies to offer more efficient routing, and fulfillment services – all of which lead to greater customer satisfaction (Internet Commerce, 1999).

The focus on customer relationships and the evolutionary approach described by these organizations is in contrast to much of the hype surrounding the Internet and World Wide Web which suggests some kind of revolution in the making through radical new approaches to commerce (Wanninger, 1996, 1997).

RESEARCH METHODOLOGY

E-commerce (electronic commerce) solutions bring the open standards and universal access of the Internet to the core business processes of buying and selling goods and services. This is a great promise for a lot of companies to jump start into E-commerce, but generally a lot of companies are relatively cautious in adopting E-commerce initiatives. Some pioneers, for example Amazon.com, who has been operating online retailing business for sometime are still struggling to make the company a profitable one, but others like example Cisco is doing wonders with their E-commerce efforts.

E-commerce is being adopted by many organizations in their business model, which emphasizes speed, efficiency and customer relationship. Studies on critical success factors for numerous organizations shows online competitiveness, customer relationship management, and value chain management are becoming driving factors in today's competitive marketplace. Therefore, online competitiveness, customer relationship management, and value chain management would influence in e-commerce initiative. Organization's internal factor, such as the organizational setting is another factor that may impact the e-commerce implementation. Organizations need to have an appropriate culture and setting to adopt e-commerce successfully. Figure 2 provides a graphical representation of the conceptual theoretical framework.
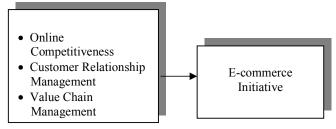
Figure 2: Conceptual Model of Driving Forces in Commerce Initiative

HYPOTHESIS

Malaysia attracts large numbers of foreign investments in the manufacturing sector, primarily in the electrical and electronics industry, which is the top export earner. The value of electrical and electronic products grew by 22% in 1999 to RM 185.3 billion, and accounted for 57.7% of all exports from Malaysia (The Star, 5-Feb-2000). In the globalization age, Malaysian companies need to be well equipped with enabling technologies to be competitive in the open marketplace.

The small and medium industries (SMI's), which are providing products and services to the multi nation corporations (MNC's), will continue to the centre of growth for Malaysian based companies. Due to better IT infrastructure and exposure in their homeland, MNC's are generally thought to be the forerunner on e-commerce initiative. In the quest to streamline their business processes, MNC's will be slowly imposing e-commerce requirements on SMI's for continual business transactions.

Hypothesis 1 is intended to study the differences in e-commerce readiness level between companies of various equity holding, this is to test if Malaysian companies are lagging in e-commerce readiness.

Hypothesis 1: Equity holding structure is influencing decision of electronic commerce initiative.

Online competitiveness, value chain and customer relationship management are being pursued by many organizations to be their core values in their business processes. Most other literatures also put forward business models, which include these elements. Hypothesis 2 is intended to test impact of these variables in affecting decisions on e-commerce adoption.

Hypothesis 2: Online competitiveness, customer relationship management and value chain management are influencing decision of electronic commerce initiative.

DATA COLLECTION AND MEASUREMENT

The target population for this study consists of manufacturing firms located in Free Industrial Zone in the state of Penang and Kedah. From the Penang Development Guide, it was estimated that the manufacturing population would be about 300 companies. Sources from Perbadanan Kemajuan Negeri Kedah (PKNK) indicated there were about 150 companies operating in Industrial Zone in Sungai Petani and Kulim.

This study required that the sample to have Internet connectivity and other IT infrastructure setup, with appropriate understanding and exposure to Internet transaction functionalities and capabilities. Given the situation, the probabilistic method of sampling would not have achieved the level of accuracy and confidence desired in this study. As such, the purposive judgmental sampling method was used in the sampling design.

Data collection was primarily done by personal delivery and mail. A number of sampled companies selected were contacted to identify individuals to answer the questionnaire, others are addressed to the IS manager of the company. The respondents for this study were the decision makers or IT personnel influencing decision making in investment in computerization projects. A self-addressed, stamped envelope was included to facilitate the return of the completed questionnaire. Some of the questionnaires were distributed by IT vendors, who knew their clients well and were in regular contact with them, and the return rate were expected to be higher.

The questionnaire was sub-divided into several sections. Section A consisted of 7 general questions, where respondents were requested to provide some general information pertaining to individual and organization profile. Section B has 4 questions that are intended to reveal more information about respondents' IT infrastructure setup. Section C has 17 questions correspond to Online Competitiveness, Customer Relationship Management, Value Chain Management. Each item in section C was measured on a 6-point Likert scale anchored by 1 (Strongly Disagree) and 6 (Strongly Agree), with the response of 6 indicating the element strongly influencing e-commerce initiative.

In order to ensure the reliability of the measures, the multiple statements on Online Competitiveness, Customer Relationship Management and Value Chain Management were assessed with Cronbach's Alpha reliability test. The alpha value ranges from 0.73 to 0.88. The values of Cronbach Alpha indicates high reliability of measurement for all the independent variables. Table 1 shows the alpha value for all variable grouping.

Table 1: Cronbach's Alpha Value for Variable Grouping

Variable	No. of Items	Cronbach's Alpha
Online Competitiveness	7	0.8766
Customer Relationship Management	5	0.8116
Value Chain Management	5	0.7313

RESULTS

A total of 220 questionnaires were distributed through mail, MBA course-mates and IT vendors, only 115 were collected from respondents in this survey. Of the 115 received, only 85 are usable for the purpose of this study. The response rate was approximately 52%, while the overall response rate was about 39%. Table 2 shows the profile of the sample.

Table 2: Respondent/Organization Profile

Profile	Description	Number	%
Designation	Managing Director	9	10.6
	Director	7	8.2
	Department Manager	24	28.2
	Section Manager	45	53.0
No. of Employees	Less than 300	32	37.6
	Between 301 to 2000	27	31.8
	More than 2000	26	30.6
Equity Structure	USA	41	48.2
	Japan, Taiwan, Korean	9	10.6
	Europe	7	8.2
	Malaysia	28	33.0
IT Awareness	Low	7	8.2
	Medium	39	45.9
	High	39	45.9

Of the 85 respondents, nine were Managing Directors, seven were Directors, twenty four were Department Managers, while forty-five Section Managers make up 53% of the respondents. As for the organization profile, 32 companies have less than 300 employees, while 27 companies have between 301-2000 employees and 26 companies have more than 2000 employees. On the equity holdings of the responding organizations, the majority of companies, 67% or 57 companies were foreign owned. Of the 57 foreign owned companies, 41 companies are USA-based, while East Asia (Japan, Taiwan and Korea) and Europe have 9 and 7 respectively.

IT awareness for the responding companies were relatively high, with 39 companies having high awareness level, 39 companies with medium awareness, and only 7 companies having low awareness.

E-Commerce Readiness Profile

There were five levels of e-commerce readiness being measured in this study, 47.1% of the responding companies were already using e-commerce to perform business transactions, 10.6% has plans to start e-commerce in the next six months, 14.1% planned to implement e-commerce between six to twelve months, 20.0% may adopt e-commerce in more than twelve months, while 8.2% or seven companies has no plan in place for e-commerce.

Table 3: E-commerce Readiness Profile

Profile	Description	Number	%
E-commerce readiness			
5	Already in place	40	47.1
4	In the next 6 months	9	10.6
3	Btw 6 to 12 months	12	14.1
2	More than 12 months	17	20.0
1	No plan as yet	7	8.2

The descriptive analysis below shows that the mean for all the three variables Online Competitiveness, Customer Realtionship and Value Chain Management is high. This further strenghtens our postulation that these three variables strongly influences the e-commerce readiness.

Table 4: Descriptive Statistics of the Composite Variable

Variable	Mean	Std Deviation
Online Competitiveness	4.69	0.78
Customer Relationship Management	4.72	0.74
Value Chain Management	4.37	0.73

Influence Of Equity Holding Structure On Electronic Commerce Initiative

Results of the test of differences (Kruskal-Wallis One-Way ANOVA) is shown in Table 5. The test is significant which indicates that equity holding is influencing decisions on e-commerce initiatives. From the mean ranking we can see that the USA based companies are much much e-commerce ready compared the the other three regions.

Table 5: Mean Rank Result by Equity Structure

	N	Mean Rank
E-commerce Readiness		
USA	41	51.28
East Asia	9	36.33
Europe	7	37.64
Malaysia	28	34.43
Total	85	
Chi Square		11.072
Df		3
Asymp. Sig.		0.011

Influence Of Online Competitiveness, Customer Relationship Management And Value Chain Management On Electronic Commerce Initiative

For multiple discriminant analysis, the e-commerce readiness levels were separated into three groups, namely group 1 (No plan as yet), group 2 (In the next 6 months, Btw 6 to 12 months and More than 12 months), and group 3 (Already in place). Group 1 has 7 companies, group 2 has 38 companies, and group 3 has 40 companies.

Table 6: Hit Ratio for Cases Selected in the Analysis

Actual Group	Cat.	N. of Cases	Predicted Group Membership		
			1	2	3
No Plan Yet	1	6	4	2	0
			66.7	33.3	0.0
Planning	2	22	3	15	4
			13.6	68.2	18.2
Implemented	3	33	0	6	27
			0.0	18.2	81.8

Note: Percentage of "grouped" cases correctly classified: 75.41%

Table 7: Hit Ratio for Cases in the Holdout Sample

Actual Group	Cat.	N. of Cases	Predicted Group Membership		
			1	2	3
No Plan Yet	1	1	0	1	0
			0.0	100.0	0.0
Planning	2	16	0	12	4
			0.0	75.0	25.0
Implemented	3	7	0	1	6
			0.0	14.3	85.7

Note: Percentage of "grouped" cases correctly classified: 75.00%

Table 8: Comparison of Goodness of Measure

Measure	Value	Hit Ratio for Holdout Sample
Maximum Chance	66.6%	75.00%
Proportional Chance	53.12%	75.00%
Press Q		
Table Value		6.635
Calculated Value		18.75**

Note: ** significant at $\alpha = 0.01$

Table 9: Summary of Interpretive Measures for Discriminant Analysis

Indep.	Discriminant Function Loading		Univariate	Potency
Variable	Function 1	Function 2	F Ratio	Index
Online	0.847	-0.108	29.092	0.702
Value	0.787	0.999	17.635	0.628
Customer	0.651	-0.710	25.225	0.426

For the discriminant analysis the sample was divided into two portions, with the first group called the cases selected (used for estimation) and the second group called the holdout sample (used for predictive accuracy). This is done to test the internal validity of the model and assessment of its predictive accuracy.

As can be seen in Table 6 and 7 the predictive accuracy of the model is 75.41% and 75% respectively. What can be concluded here is that by using the three variables of online competitiveness, customer relationship management and value chain management we can classify the respondents according to their e-commerce readiness.

To test further whether the model is good three tests were conducted as depicted in Table 8, the hit ratio exceeds both the maximum likelihood and proportional chance criterias. Also it is signicant at 0.01 using the Press Q statistics.

Table 9 shows the interpretive measures where the discriminat function loadings, univariate F ratio and also the potecny index is presented. From the potecy index we can conclude that online competitiveness is ranked the most important followed by value chain management dan customer relationship management in influencing e-commerce initiatives.

DISCUSSION

This study is an exploratory study in which the researcher is interested in identifying the major factors driving the initiative on e-commerce strategy. This study is also intended to establish if Malaysian companies operating in the FIZ Penang and Kedah are lagging in initiative in adopting e-commerce compared to foreign companies.
This study found Online Competitiveness, Customer Relationship Management and Value Chain Management are factors significantly affecting e-commerce initiative for manufacturing companies operating in FIZ in the state of Penang and Kedah. This is consistent with opinions of most IT experts in the e-commerce, and may serve as a guideline for other companies in evaluating e-commerce project implementation.

Most companies operating in FIZ Penang and Kedah have been in business for a number of years and they are relatively up to date in IT deployments, the Internet connectivity has provided them an effective medium to enhance their strengths in online competitiveness, customer relationship management and value chain management. These strengths will enable them to operate efficiently and improve their ability to respond to competitive pressures on costs, speed and quality.

Due to geographical reasons and lagging in advanced IT infrastructures and technologies, Malaysia is generally seen as slow in adopting new and enabling technologies. Malaysian companies are expected to fall behind foreign companies in e-commerce initiative in this study. This study found American companies are leading Malaysian companies in e-commerce initiative. However, this study found Malaysian companies on par with European and East Asian companies in e-commerce initiative. The purposive judgmental sampling method employed in this study may also have caused the good rating on Malaysian companies in e-commerce initiative.

Records from IT vendors have shown more than 50% of responding Malaysian companies are well equipped with substantial IT infrastructure setup, e.g. EDI, ERP applications and groupware applications.

Many multinational corporations have been operating in FIZ in Penang for more than 25 years, and most of them frequently imposing requirements for good IT infrastructure setup on their business partners. Over time, these Malaysian companies supporting the multinational corporations have also upgraded their facilities and technology adoption to be on par with their major customers for continue-businesses. At least three responding Malaysian companies are KLSE listed companies, which are well managed, are known to have IT infrastructure and applications on par with other multinational corporations.

IMPLICATIONS OF FINDINGS

The findings suggest several general implications. This study enlightens us about Malaysian companies' readiness into e-commerce. Malaysian companies are only lagging behind American companies, but on par with European and East Asian companies in electronic commerce initiative. This is in contrary to general perception that Malaysian companies are lagging in IT implementation. Inline with the 7th Malaysian Plan (The Star, May 7 1996) to help local companies to be IT ready as we are moving towards more open and challenging marketplace in the globalization age, a lot of Malaysian companies may have heed the government's advise and take up the challenge.

Malaysian manufacturing companies, particularly in the small and medium industries operating in Free Industrial Zone in Penang and Kedah, are mostly relying on MNC's for business. They enjoy comparative advantages in lower labor cost, availability of skilled workforce, and government protection from foreign competition. Foreign direct investment in Malaysia has slowed down recently, especially after the Asian financial crisis. Malaysian manufacturing companies need to look into expanding their current market for continued business and future growth. The world is moving into the trade liberalization era, transitioning from GATT to WTO, barrier and control on international trade will be dismantled stage by stage. As we are moving into a bigger and more open economy, American companies with its global presence and size, coupled with its efficiency achieved through effective management, and new and enabling information technology will continue to dominate the world market. Malaysian companies can emulate the American companies in adopting e-commerce strategy to compete more effectively in the globalization age.

In today's 'Networked Economy', where individuals and companies worldwide are being electronically linked, e-commerce will be a norm in time to come. Companies should continue to evaluate effective strategy to maintain international competitiveness. Online competitiveness, customer relationship management and value chain management are important strengths for Malaysian companies to acquire or enhance further to compete effectively in the open global marketplace.

E-commerce is an enabling technology for smaller Malaysian companies to engage in business with their customers worldwide; with informative web site hosted by Internet service providers, they can attain online competitiveness with greater market reaches and well-profiled interactive web site resources enhance customer relationship. Logistics and payment gateways can be managed by established courier service and bank with no start-up cost. This enables smaller companies to compete effectively as other bigger companies which have establishment on sales, marketing, finances and distribution functions in their organizations. Smaller Malaysian companies can concentrate their limited resources into their core competency to develop competitive products and services. Malaysian companies that have not planned or embarked on e-commerce can use this study as a guideline in evaluating their strengths in online competitiveness, customer relationship management and value chain management.

REFERENCES

Anderson Consulting (1999). What is eCommerce? eEnterprises conduct eCommerce in the eEconomy [Online] Available *http://www.ac.com/ecommerce/ecom_what_is.html*
Bitner, M. J. (1995). Building Service Relationships: It's All About Promises, *Journal of the Academy of Marketing Science*, 23(4), Fall, 246 - 251.
Cisco Connection Online.*(http://www.cisco.com)*
Cisco Intelligent Network Services: White Paper (1999) [Online] Avaliable *http://www.cisco.com/warp/public/cc/sol/mkt/ent/ccn/cins_wp.htm*
Electronic Commerce World Institute (1996), *Resource Center Glossary* [Online] Available *http:/www.ecworld.org/ResourceCenter/Glossary/glossary.html*
Ecommerce Resource: *The Ecommerce Guide* [Online] Available *http://ecommerce.internet.com/resources/library*

Forrester's Leading Internet Research [Online] Available *http://www.forrester.com*

Hogg, E. C. A. (1995), NewLink Partner, Everything is Speeding Up [Online] Available *http://www.newlink.on.ca/~wayneb/n951207.htm*

Haynes, T. (1995). The Electronic Commerce Dictionary;The Robleda Company [Online] Available *http://ecommerce.internet.com/resources/library/*

HP e-servces Centre [Online] Available *http://www.hp.com/e-services*

Internet Commerce (1999). Linking Supply Chains for Profit, *Oracle Magazine,* 11(3), May/June 1999.

Kalakota, R., & Whinston, A. B. (1996). *Frontiers of Electronic Commerce*, Addison-Wesley Publishing Company.

Kosiur , D. (1997). *Understanding Electronic Commerce*; Microsoft Press.

Melnicoff, R. M. (1999). The eEconomy: It's later than you think, *Outlook 1999, 21.* [Online] Available *http://www.ac.com/ecommerce*

Multiactive Software's ecBuilder [Online] Available *http://www.ecbuilder.com/ecomnews*

Neece, J. (1995). Caught in the Net of Support, *New York Times*, Sunday, June 11 1995.

Porter, E. (1994). Commercialization of the World Wide Web, *Internet Conference on WELL*, Nov. 16 1994.

Saia, R. (1999), *Tech Topics are Top CEO Concerns* [Online] Available *http://computer.idg.net/crd_it_23506.html*

Stone, B. (1994). *Successful Direct Marketing Methods*, Lincolnwood, IL: NTC Business Books.

Technology Adoption, Internet Method Consulting (1999) [Online] Available *http://www.internetmethods.com/content/success_factors.htm*

The Star (Feb 5 2000), *Very Good Year: Malaysia notches RM 72b trade surplus for '99* [Online] Available *http://www.thestar.com.my/online/newsreport.asp?file=/2000/2/5/nation/0501jasu.asp&newspage=Search*

The Star (May 7 1996). *Nurturing high technology with local touch (The 7th Malaysian Plan)* [Online] Available *http://thestar.com.my/archives/7mplan/man45.html*

Verity, J. W., & Carey J. (1994). The Internet: How it will change the way you do business? *Business Week*, November 1994.

Wanninger, L. A. (1996). An Evolutionary Approach to a Revolutionary Set of Business Opportunities, *1st Annual University of Minnesota Conference on Electronic Commerce* [Online] Available *http://www.iii.csom.umn.edu/ecconf/, 1996*

Wanninger, L. A., & Bahn, D. (1996). Star Tribune Online™: A Case Study of a New Venture in the Emerging Information Industry, *MISRC Working Paper.*

Wanninger, L. A. (1997). Cheri Anderson, and Robert Hansen, Designing Servicescapes for Electronic Commerce: An Evolutionary Approach, *MISRC Working Paper*.

Wanninger, L. A. (1997). *A Conceptual Framework for Profitable Electronic Commerce*, Carlson School of Management, Minneapolis.

Development Of E-Commerce For Small-Medium Enterprises In Sarawak

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ABSTRACT

In an effort to advance the development and adoption of e-commerce by SMEs in Sarawak, this study is an attempt to provide an overall view on e-commerce adoption, e-commerce application, possibilities and avenues in relation to local SMEs. It identifies the barriers and obstacles which inhibit the adoption of e-commerce. It also highlights the critical success factors regarding the development of e-commerce. It has been observed that the political, economics, social and technological issues affected e-commerce adoption. Conclusive evidence from the survey established the fact that using e-commerce to open up wider market share can be achieved by providing online services and advertisement, the establishment and promotion of internet culture, upgrading securities, mapping global market accessibility, and the building of information centres to address gaps in promoting the use of e-commerce. The provision of the supporting services and the related measures taken will give SMEs a better understanding of the benefits of using e-commerce resulting invariably in more participation and ultimately adoption. Finally, this study also provides suggestions and recommendations to individual SMEs and governmental bodies to facilitate them to carry out Research and Development studies or programmes in due course.

INTRODUCTION

The rapid growth of the internet as a consumer technology has led to the accelerated use of electronic commerce (e-commerce) nationally as well as globally. E-commerce through the internet is a new way of advertising, buying, selling, and in some cases, delivering goods and services. There has been much hype about the potential of the internet to transform supply chains and business processes. Despite the setbacks following the deflation of the 'dot.com bubble' in the United States and elsewhere, the internet is beginning a new phase of adoption and utilization (Industry of Tourism and Resources, 2002). E-commerce not only affected business and individual consumers, but it also reshaped market places, trading relationships and even international trading boundaries.

The important of small and medium-size enterprise (SME) in e-commerce can be reviewed from past studies. Burgess (1998) concludes that for SMEs they must be involved in e-commerce one way or another if they are to survive. Survey done by Foley, Sutton and Jayawardhema (1999) has provided some interesting statistics that continues to add value to the argument that all businesses should be involved in e-commerce. However, they also show some confusing and conflicting results generated from e-commerce surveys and predictions. Using these figures it appears that small, medium or large businesses must be doing e-commerce to remain competitive.

In view of the potentials and concerns on e-commerce, as mention in Eighth Malaysia Plan, a National Electronic Commerce Committee was set up to formulate a framework aimed at promoting and coordinating the development of e-commerce (Economic Planning Unit [EPU], 2001a). Looking at the SMEs capabilities, the Third Outline Perspective Plan state that Malaysian SMEs serve as strong foundation to anchor the nation's industrial sector, encourage working towards establishing and strengthening their own niches in the market and emerging as market leaders in their own right (EPU, 2001b).

Former prime minister and minister of finance Malaysia, Dr. Mahathir Mohamad (2001), in his 2002 National Budget state that "In order to compete in the international market, small and medium companies must participate in the Global Supply Chain Management Network for online and real-time procurement, production and logistics management". In line with the national direction, the Sarawak government continue to provide the information and communication technologies (ICT) infrastructure and facilities that are required to promote ICT and to narrow the digital divide among the urban and the rural populace, the private sector's role is also critical in the development of e-commerce in the state (Taib, 2002).

Definition Of SME

Every country has a different definition of what SME is, while some counties do not have a clear definition of SME. So the definition of SME for this study is based on Malaysian government agencies, Small and Medium Industries Development Corporation (SMIDEC, http://www.smidec.gov.my) and SMI Association of Malaysia (http://www.smisme.com). Both of them define as manufacturing companies or companies providing manufacturing related services with annual sales turnover not exceeding RM25 million and full-time employees not more than 150 (Asian-Pacific Economic Cooperation [APEC], 1998).

E-Commerce Perspective

Similarly with the definition of SME, it is difficult to find a consistent definition for e-commerce. Several definitions of e-commerce have been developed and used in different contexts and for varying purposes. The following are a few selected definitions for e-commerce in differences perspectives. APEC (1998) mention that "there are a number of levels of engagement in e-commerce that require different levels of infrastructure and involve different costs, e-commerce needs to be recognized as covering a broad range of activity". IBM (http://www.ibm.com) describes e-commerce terminology as "the subset of e-business that involves the exchange of money for goods or services purchased over an electronic medium such as the Internet". Iowa State University (http://www.iastate.edu) state that "all activities related to interaction between two trading partners except production and delivery of physical goods and services". Kalakota and Whinston (1997) recognize that there are various definitions of e-commerce depending on different perspectives, which includes communications, business process, service, and online electronic processing. Kalakota and Whinston (1997) do provide a general definition as "e-commerce emphasizes the generation and exploitation on new business opportunities and, to use a popular phrase: 'generate business value' or 'do more with less'". Organisation for Economic Co-operation and Development (OECD, 1999) has adopted a policy driven definition as "business occurring over open, non-proprietary networks such as the Internet". TechRepublic (2000) specifies that "the use of communication technologies to transmit business information and transact business, taking an order over the telephone is a simple form of e-commerce. Internet commerce is also e-commerce but is only one of several advanced forms of e-commerce that use technology, integrated applications, and business processes to link enterprises". Turban, Lee, King and Chung (2000) define e-commerce as "the process of buying and selling or exchanging of products, services and information via computer networks including the internet". Conclude all the above definition from various perspectives, the definition of e-commerce should embody the notion of ICT adding value to commerce and some implied concept that includes the value chain. That is, ICT enhances an organizations capability in the trading of goods and services between two parties who are part of their value system. Thus the definition for e-commerce that is applied in this study defines as the use of computers and electronic networks to conduct business over the Internet or other electronic network.

PROBLEM STATEMENT

SMEs are significant players in Sarawak business, which constitutes more than 90 per cent (Department of Statistics, 2003) of all business establishments. SMEs that can demonstrate their capabilities to use e-commerce will have a competitive advantage in e-commerce market. Are SMEs aware of progress in the area, and work towards identifying potential barriers and problems, solving any problems, and exploring opportunities and benefits for SMEs in Sarawak? Are the local SMEs going to be bystanders or to participate in the mainstream of e-commerce development? For those SMEs which are ICT illiterate, if they are going to develop a more sustainable and durable organization, they must move away from the traditional subsistence activities, change their mindset, attitudes, thinking and approaches. They must be ready to change either gradually or through a quantum leap.

According to Taylor Nelson Sofres Interactive, e-commerce is stumbles in Malaysia (Nua, July 13, 2001). It is to understand the level of adoption business focus in the development of internet with ICT and the expansion of e-commerce, it is imperative for SMEs to look for ways to ensure a more successful venture into e-commerce, to find out the possible strategies that SMEs should formulate and implement in order to establish more appropriate business model which can sustain in this changing world.

Beside that, the state government of Sarawak can have a better understanding in focusing on policy setting in stimulate the e-commerce development by assess the success elements on how the community uses e-commerce with an emphasis on the potential opportunities and perceived benefit of e-commerce.

OBJECTIVES

The purpose of this study is to achieve the following objectives concerns the development of e-commerce for SMEs in Sarawak.

- To discover the impact of e-commerce on the SMEs through the analysis of their business management and information technologies.
- To know how SMEs perceive security and legal issues, and their opinion as to their importance to the uptake of e-commerce.
- To assess how SMEs perceive economies' interventions to promote and support the adoption of e-commerce.
- To analyze and work out a strategy to help SMEs face the impact of e-commerce; with an emphasis on the potential opportunities and perceived benefits of e-commerce by SMEs.
- To evaluate the barrier and propose concrete ways in which SMEs can eliminate barriers that may deter them from becoming part of the digital economy.

The study results will provide recommendation options for Sarawak's state government to promote e-commerce develop future work plans and serve as guide for policy setting and analysis functions and technology pilot project selection. Beside that, this study results should also help the SMEs who intend to go for e-commerce as a reference, to enjoy the opportunities offered and aware of the threats in e-commerce development. But for e-commerce service providers, this study will provide a clear understanding for them to decide what direction to focus on in order to assist the SMEs to minimize investment and gain maximize return.

THEORETICAL FRAMEWORK

This study was to undertake a qualitative assessment of the adoption, uptake and use of e-commerce by SMEs. It investigated the opportunities, benefits and the real and perceived barriers to the adoption and use of e-commerce among SMEs in the region. In particular, this study sought the opinions of early adopters and users of e-commerce in the SME community. This approach was then used to identify measures, in terms of policies, programs or initiatives, which might be taken by Sarawak government to address the barriers identified by early adopters and thus enable the next wave of SMEs to adopt e-commerce without facing the same barriers.

STATUS OF ICT AND E-COMMERCE READINESS

Despite the setbacks suffered by e-businesses in 2000, the government was a major promoter of Internet growth, continuing with plans to create a knowledge-based economy and increase Internet penetration to 25% by 2005. (Economist Intelligence Unit [EIU], 2001) Support measures introduced in the past year include a new M$500m venture-capital fund, tax incentives for venture capital for technology firms and other high-risk investments, ongoing implementation of the technology-oriented Multimedia Super Corridor (MSC), and a whole slate of new laws on protecting intellectual property. The government also created several new agencies in 1998 to regulate and advance Internet growth (EIU, 2001, July 9).

As shown in table 1, Malaysia is ranking at 32 of 60 countries being rated globally by EIU on e-readiness. It is position at the second highest as a follower among the ASEAN 5, where as Singapore is maintain as a leader in e-readiness and top position in ASEAN 5 countries. The potential of e-commerce development in Malaysia are relatively high. Table 2 shows Malaysia recorded 1.7 million of dollars in 2002 and expected to growth to 18.4 billion of dollars in the next 4 years, with the higher compound annual growth rate of 81.4 per cent.

Table 1: E-Readiness Rankings, 2003

Country	2000	2001	2002	2003	E-readiness (%)	E-business Group
Indonesia	38	54	52	53	33.1	laggard
Malaysia	32	33	32	33	55.5	follower
Philippines	46	39	49	47	39.3	follower
Singapore	8	7	11	12	81.8	leader
Thailand	28	46	46	42	42.2	follower

Note: Decimals have been rounded.
%: Per cent weight in overall score.
E-business Group: leaders: These countries already have most of the elements of "e-readiness" in place, though there are still some concerns about regulatory safeguards.; followers: These countries--the largest group in the rankings-- have begun to create an environment conducive to e-business, but have a great deal of work still to do.; laggards: These countries risk being left behind, and face major obstacles to e-business growth, primarily in the area of connectivity (EIU ebusiness forum, 8/5/2001).

Source: The Economist Intelligence Unit e-readiness rankings, (various years).
EIU ebusiness forum, (2000, May 4) for 2000 rankings.
EIU ebusiness forum, (2001, May 8) for 2001 rankings.
EIU ebusiness forum, (2002, July 12) for 2002 rankings.
EIU ebusiness forum, (2003, March 31) for 2003 rankings, E-readiness %.

Table 2: Potential Of E-Commerce Development (2002-2006)

Country	2002	2006	CAGR (%)
Indonesia	0.1	1.6	100.0
Malaysia	1.7	18.4	81.4
Philippines	0.1	1.4	93.4
Singapore	10.5	66.4	58.6
Thailand	0.2	2.9	95.1

Note: Decimals have been rounded.
CAGR: compound annual growth rate.
Unit of measurement: billion of dollars.
Source: UNCTAD, (2002) E-Commerce and Development Report 2002, Table 8.

One of the major government initiatives in stimulates supply and demand on ICT market was setting up MSC, which is the most ambitious project to create Malaysian "Silicon Valley". Figure 1 show the statistics of all the sectors approved by MSC as at 13th January, 2004. Internet based business, e-commerce service or solution provider is one of the top 3 popular sectors in MSC flagship project in reaching catalyst for ICT development through the country.

Note: a - Software Development - Business Applications
      b - Software Development - Eng. & Specialised Apps.
      c - Internet based Business - E-Commerce service / solution providers
      d - Content Development
      e - Hardware / Electronics Design
      f - Internet based Business - Application Service Provider
      g - Education / Training
      h - Systems Integration
      i - Telecommunications / Networking
      j - Wireless / Mobile Technology

Source: MDC, (2004, January 13), MSC Facts and Figures, No 4.
        Retrieved from http://www.mdc.com.my/xtras/fact_figures/msc.asp

Figure 1: Approved MSC Companies as of 13th January 2004

Take closer look at the e-readiness by EIU resent ranking on Malaysia, figure 2 illustrated all the six categories that influence the ranking system. The business environment seems to gain competitive advantage in all factors. Connectivity and technology infrastructure is the enabling factor to move e-commerce; it is not well covered through the country, indirectly, it slow down the development, on promoting e-commerce locally, there is another additional common infrastructure need to take into consideration.

Evaluation on how prepared the country is to capture the benefits of technology to promote economic growth and productivity is a comprehensive assessment done by World Economic Forum, Out of 82 countries ranked in the Global Information Technology Report 2002-2003 (Dutta, Lanvin & Paua 2003). Currently Malaysia is also ranked at 32 in Networked Readiness Index. Whereas it's neighboring Singapore is ranked at no 3, it can be a good example to follow.

Source: EIU, (2003), The 2003 e-readiness rankings.
A white paper from the Economist Intelligence Unit, written in co-operation with IBM.
Retrieved from http://graphics.eiu.com/files/ad_pdfs/eReady_2003.pdf
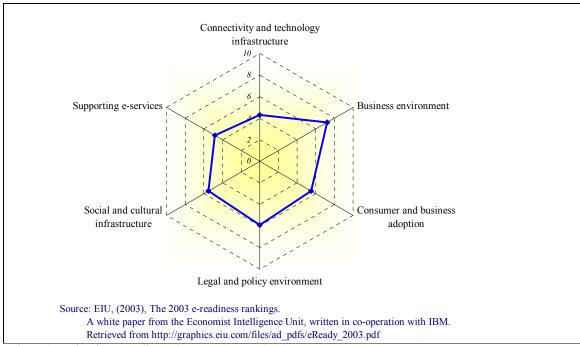
Figure 2: Malaysia E-Readiness Category Scores, 2003

Another encouraging element is on the registration of internet domain name, from table 3, the new Malaysian commercial domain name registration is maintain at higher growth, it is more than a total of 40,000 commercial domain name registered since 1995. It really shows the growth of this new emerging market, the availability of local businesses in internet presence, despite of bursting of the dot-com bubble, Asian economic crisis and global economic slowdown.

Focusing on SMEs in Sarawak, figure 3 indicate industry sectors like food processing, garments, machinery and equipment, structural and fabricated metal products cover 70 per cent of SMEs establishment. Figure 4 shows the basic ICT infrastructure in Sarawak. There is a huge potential to introduce internet and personal computer to the household because the census 2000 by Department of Statistics shows that there is a total of less than 10 per cent of household have internet and personal computer.

Table 3: Total Number Of .My Domain Name Registrations

Year	*.com.my	*.net.my	*.org.my	*.gov.my	*.edu.my	*.mil.my	Total
1995	100	3	4	31	13	-	151
1996	537	32	30	73	42	-	714
1997	1,306	61	37	57	30	-	1,491
1998	2,061	86	42	62	61	-	2,312
1999	4,738	222	144	64	63	-	5,231
2000	10,048	378	192	51	74	-	10,743
2001	7,372	348	204	83	111	-	8,118
2002	7,514	334	216	81	126	1	8,272
2003	8,030	408	289	99	154	3	8,983
1995-2003	**41,706**	**1,872**	**1,158**	**601**	**674**	**4**	**46,015**

Source: MYNIC Statistics, (2004), retrieved from
     http://www.mynic.net.my/newhp/mynic-reg-summary.cfm

Note: Sector distribution as a percentage of total industry establishment in Sarawak.
Source: Department of Statistics, (2003), Census 2000, unpublished work.
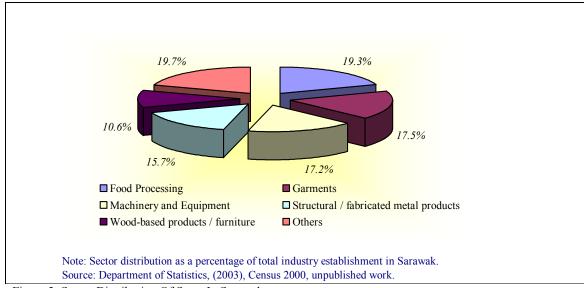
Figure 3: Sector Distribution Of Smes In Sarawak

Besides that, with the globalization and liberalization, government effort and support is the driver of e-commerce adoption. Sarawakian must face the challenge and compete with the outside world.

E-COMMERCE ADOPTION AND DEVELOPMENT

According to Chambers of Commerce of Ireland (2002) on chamber SME e-business survey 2002; there is about 84 per cent of internet penetration rate within the SMEs market and 50 per cent of SMEs have their own websites. From United Kingdom's national statistics (2002) results for 2001 e-commerce survey of UK businesses indicate that 46 per cent of the smallest sized businesses were online, compared with 98 per cent of businesses with 1,000 or more in employment. Indirectly, it is means that the larger the business the more likely it is to be online.

Note: From total household of 415,100 in Sarawak state.
Source: Abdul Aziz (2003), State government initiatives in the Development of ICT.
adapted from Department of Statistics, Census 2000.
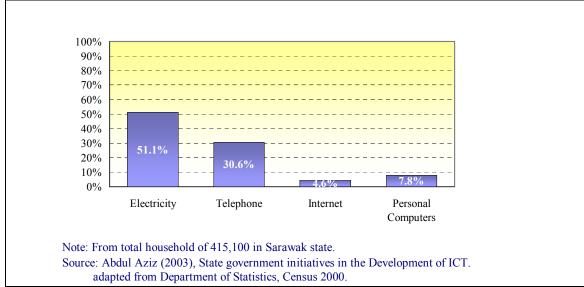
Figure 4: Basic ICT Infrastructure in Sarawak

With realizing the important of online, internet and e-commerce, the Malaysian government initiates two sub-committees chaired by the Ministries of International Trade and Industry (trade and finance) and Ministry of Energy, Communications and Multimedia (infrastructure) obtained the endorsement of the Cabinet to use the National Electronic Commerce Strategic Directions as the strategic document for related ministries and

government agencies. (Multimedia Development Corporation [MDC], http://www.msc.com.mt/mdc) The report document seeks to identify and describe the most prospective areas for national initiatives to begin the task of securing Malaysia's e-commerce future. (Ng, 2003; Mazlan, 2003) From the surveys conducted for 800 SMEs throughout country, about 90 per cent had computers, just over half had internet access and less than 20 per cent had a web sites. Less than 5 per cent of Malaysian companies had implemented internet payment system in 1999 (MSC Technology Centre, 1999). This shows the status of e-commerce progress in Malaysia, and the government are played their role in facilitating the use of e-commerce for SMEs and in increasing their ability to reap the benefits (e.g. via awareness building and training programme). The governments also in partnership with the private sector to establish a more comprehensive and consistent policy approach to SMEs and e-commerce, and apply evaluation mechanisms to assess what works and does not work (UNCTAD, 2001).

To re-intermediate the economic competitiveness in the manufacturing sector with emphasis on the electronic and electrical clusters, Technology, Industry and Government working together for E-economic Revolution (TIGeR) project provides an integrated platform for collaboration between manufacturers with their global and local buyers and suppliers, the strategy is to encourage SMEs to adopt and implement e-business applications for on-line real-time participation with an e-community of multi-tier suppliers, manufacturers, buyers and governmental bodies (Tengku, 2002; Latifah, 2002).

BENEFITS OF E-COMMERCE

The adoption of electronic commerce by SMEs depends largely on their perception of the opportunities and benefits afforded by electronic commerce and the relevance of these opportunities to their business. As shown in table 4, most SMEs participating in the survey by APEC (1999) are optimistic about the potential benefits that e-commerce can bring to their business.

Benefit to Consumers

Electronic commerce enables firms to be more responsive to customer needs and more efficient in interacting with and servicing business and consumer needs. SMEs value the fact that e-commerce enables them to offer 24-hour per day information to customers through their Internet web site and respond more quickly to customer inquiries and requests for information by email. E-commerce allows SMEs to be more targeted in their customer communications and realize more cost reductions in their advertising and product promotion. They value the ability to standardize customer information digitally and update it efficiently and at lower cost. SMEs believe that e-commerce will enable them to gather and compile better market intelligence on their customers, suppliers and competitors through Internet research and better develop and update customer databases, including online databases. By providing a higher quality of service and better information exchange with customers, SMEs believe that e-commerce will offer important benefits in improving longer-term customer loyalty and retention.

Table 4: Potential Benefits Of E-Commerce Use By Smes

Rank	Top 10 Benefits
1	Improve customer service
2	Enhance company image
3	Customer information exchange
4	Improve competitive position
5	Increase customer loyalty
6	Access international markets
7	Increase revenue
8	Reduce costs of information
9	Supplier information exchange
10	Attract new investment

Source: APEC. (1999). SME Electronic Commerce study,
Exhibit 2.1

Improving the company image and competitive position is a very important perceived benefit of electronic commerce. Many participating SMEs believe that e-commerce can enable firms to develop a presence and compete in markets that were previously untapped by SMEs. Traditional barriers such as distance,

communications costs and access to international markets that prevented SMEs from competing with larger firms are not as significant. Electronic commerce can remove some of these barriers and SMEs recognize this as an important benefit of developing their e-commerce capabilities.

Benefit to Organizations

SMEs with higher levels of e-commerce capability identified using e-commerce to increase revenues and reduce procurement and information costs as a more important benefit than firms with lower capability. This suggests that SMEs with higher e-commerce capability levels may be more advanced in integrating e-commerce into their overall business models, and thus have higher expectations on revenue and cost benefits derived through e-commerce than do SMEs with lower levels of capability. Firms of this type typically use e-commerce to reduce product inventory, decrease warehousing costs or shorten sales and distribution cycles.

Benefit to Society

Participating SMEs with higher levels of e-commerce capabilities were more likely to identify using e-commerce to reach international markets as an important benefit. This suggests that for many SMEs, the desire to access international markets may have an important influence on promoting the rapid development of more advanced e-commerce capabilities. Many of these firms further noted that they were using e-commerce strategically to access international markets and had integrated the development of e-commerce capabilities as an important priority of this strategy.

SMEs with higher levels of e-commerce capability were more likely to identify using e-commerce to attract new investment as an important benefit. Firms that identified attracting new investment as more important were often larger enterprises that viewed e-commerce as an opportunity to modify or significantly enhance their business model and value chain thereby enabling the firm to attract new investment more effectively. Some of the SMEs also interested in attracting new investment in information systems (hardware, software) through e-commerce related funding programs.

BARRIERS TO E-COMMERCE

From pass research, Akkeren and Cavaye (1999) has studied the factors affecting e-commerce adoption by SMEs in Australia. They studied that perceived lack of business benefits, mistrust of ICT industry and look lack of time are the main inhibitors to the e-commerce adoption.

CommerceNet's 2000 Barriers to e-commerce survey (Keenan, 2002) laid out the Top 10 Global Barriers for SMEs perspective in expanding into the world of e-commerce. This list is reproduced below:
1. *Lack of qualified personnel:* Cannot attract qualified consultants and staff to implement e-commerce systems for SMEs.
2. *Lack of business models:* There are few proven business models that show how SMEs can use e-commerce to profit or expand their business.
3. *Fraud and risk of loss:* SMEs are more concerned about risk from fraud over the Internet.
4. *Legal issues:* Just like contracts, liability, etc. – there are too many legal issues to make it easy for SMEs to use the Internet to transact business with suppliers and customers.
5. *Not sure of benefit:* Most of the SMEs do not understand how e-commerce can really benefit them to gain competitive advantages.
6. *Customers can't find me:* It is difficult to differentiate between SMEs and large enterprises over the Internet.
7. *Partner e-commerce readiness:* This is a new business, most of the consultant or project manager just started to embark on this new market, and there are too few proven business models for SMEs to justify the expense of a major investment.
8. *Inconsistent tax laws:* E-commerce is doing business globally; tax incentive or laws can be varying from countries to countries.
9. *Proprietary technology:* Different computer platform may have their own proprietary design; it is hardly to develop a system suitable across all platforms. Proprietary technology restrict user from switching one system to another without redevelop the whole system. It is not interoperates and cost effective.
10. *Vertical market:* It is different market segment as compare to the traditional structure.

MacGregor, Bunker and Waugh (1998) have studied the e-commerce in SMEs in Australia and has not only discussed the various approaches used by SMEs in their adoption of ICT and have also discussed the reasons why the speculated benefits of e-commerce adoption could not be achieved and that were due to mismatched mechanism and non understanding of business environment.

OVERVIEW OF THE METHODOLOGY

This study required the opinions of early adopters and users of e-commerce in the SMEs community. This approach was then used to identify the issues affecting e-commerce adoption in terms of political, economic, social and technological in Sarawak. It is also to address the barriers identified by early adopters and thus enable the next wave of SMEs to adopt e-commerce without facing the same barriers.

This study employed qualitative methods, reinforced by quantitative techniques, to elicit the views and perceptions of SMEs with regard to potential opportunities, perceived prospects and challenges to the adoption and use of e-commerce. The study was not intended to make a statistical measurement of e-commerce uptake by SMEs in the state.

Population And Sample

Fraenkel and Wallen (1993) mentions the population is the group of interest to the researcher, or the subjects to whom the researcher would like to generalize the results of the study. One of the easier ways of getting all the SMEs in Sarawak is go through the relevant bodies like SMIDEC, Ministry of Industrial Development Sarawak (MID), Sarawak Manufacturer Association (SMA), Associated Chinese Chamber of Commerce and Industry of Sarawak (ACCCIS) or Sarawak Chamber of Commerce and Industry (SCCI). But, it is happened that the problems of getting information from the above sources are mainly because of SMEs are not all register with them, some of the bodies cover only the bumiputra SMEs, and some might cover all companies in Sarawak or Malaysia. Registrar of companies has the entire manufacturing companies in Sarawak, but they can't identify how many of them are SMEs and how many are not operating currently. Department of Statistics Sarawak is the ideal resource of collecting all SMEs in Sarawak. They did their survey regularly; it is considered as more up-to-date and more reliable. So, this study is based on their data as the population of the study.

There are nearly 2000 SMEs in Sarawak based on the criteria of employees less than 150 or annual turnover less than RM25 million. For this study, in order to have more significant result reflected on SMEs status, SMEs who have more than 20 employees will be elected as the sample of representing the entire SMEs to participate in this survey. Sampling refers to the process of selecting these subjects. So, 289 samples were then selected.

Data Gathering Procedure

Since the survey target is all the SMEs in Sarawak, so it is decided that for those SMEs in other location beside Kuching, which is less than half of the total samples, the survey questionnaire and the prepaid returned envelope were together send by post. Follow up by phone, fax or e-mail to the person in-charge. For the SMEs located in Kuching, it is grouping into areas. Later, the questionnaire was distributed either directly by the researcher, or through associates, friends and contacts. Clarifications on how to complete the questionnaire and list of SMEs in the same area to distribute are given. The respondents were given a time frame of about 1 month to complete and return the questionnaire. The questionnaire were then sorted and checked to ensure that they were properly, correctly and completely filled. Those that were incorrectly or incomplete filled were rejected.

When necessary, interviews were conducted with the respondents to understand their business environment. And also gain a better understanding of the pressures that the organization experiences from their trading partners in doing or not doing e-commerce. Managers, especially in charge of ICT development were interviewed via telephone and electronic mail to obtain further clarification.

ANALYSIS OF SURVEY RESULT

The questionnaires was distributed with the prepaid postage returned envelope to all the manufacturing companies or companies providing manufacturing related services which have employees above 20 but not more than 150. So, there were all 360 copies sent. 2 weeks later, follow up call is conducted to those companies situated in Kuching (which cover more than half of the total SMEs) areas, the undelivered copies are then

sending to the respondents again with their new address obtained via conversation. At the same times, interview and observation may also be used in this study to get a clearer understand, feedback and answers from the respondents.

As a result, total of 61 survey questionnaires (response rate: 16.9%) were collected. In this study, the Cronbach alpha (also referred to as coefficient alpha) is 0.9170. It is a high correlation, which means that the scale of questionnaires is reliable and valid.

Background Of Respondents

The socio-demographic characteristics of the respondents include the SME industries, business volume in term of annual sale turnover, and numbers of employees employed are presented in Table 5. The individual personnel who response to this questionnaire are categories into gender, age group, academic qualification are shown in Table 6; years of experience in business and the position hold in the organization are indicate in Table 7.

Table 5: SMEs Industries, Business Volumes And Employees

Vertical industry	Annual turnover (RM million)	Number of employees			
		0-50	51-100	101-150	Total
Food Processing	0-10	13	6	2	*21*
	10-20	0	2	0	*2*
	Sub-total	**13**	**9**	**2**	**23**
Structural / fabricated metal products	0-10	4	4	0	*9*
	10-20	2	2	0	*4*
	20-25	0	2	0	*2*
	Sub-total	**6**	**9**	**0**	**15**
Wood-based products / furniture	0-10	4	11	0	*15*
	10-20	2	9	2	*13*
	Sub-total	**6**	**19**	**2**	**28**
Others Industry	0-10	23	2	2	*28*
	10-20	2	0	0	*2*
	20-25	0	0	4	*4*
	Sub-total	**26**	**2**	**6**	**34**
Grand total		**51**	**38**	**11**	**100**

Note: Number of per cent (%) of total respondents

Analysis the responded SMEs in Table 5, 51 per cent of the total SMEs, their entire employees is below 50 persons, with approximately 86 per cent of them, their annual turnover is below RM10 million. Only 11 per cent of the total SMEs have above 100 employees.

There are 73 per cent of total SMEs have annual turnover below RM10 million and 6 per cent of total SMEs has existed RM20 million of turnover per annum.

From the industry sectors, wood-based products and furniture have 28 per cent responses, Food processing is 23 per cent, structural and fabricated metal products is 15 per cent, and the remaining 34 per cent come from others industry.

Presented in Table 6 are the individual executives who response to this survey. It consists of 49 per cents of male and 51 per cents of female, this represent an equal proportion of gender. But, from 21 to 35 age level, female respondents is 15 per cent more than male respondents in the same age level, and 8 per cent less than male respondents in the next 36 to 50 age level. Age above 50 respondents is only 8 per cent of the total, this may indicate that they are not really aggressive to participate or not knowing much about the development of e-commerce.

Table 6: Respondents' Qualification By Gender And Age

Gender	Age	Qualification Primary	Secondary	Diploma	Degree	Total
Male	21-35	6	11	4	-	*21*
	36-50	-	4	11	6	*21*
	above 50	-	-	2	4	*6*
	Sub-total	**6**	**15**	**17**	**11**	**49**
Female	21-35	17	15	4	-	*36*
	36-50	-	6	4	2	*13*
	above 50	-	-	-	2	*2*
	Sub-total	**17**	**21**	**9**	**4**	**51**
Grand total		**23**	**36**	**26**	**15**	**100**

Note: Number of per cent (%) of total respondents

Beside that, Table 6 also shows that 59 per cent of total respondents' educational qualifications are primary and secondary. This is a good sign for graduates to join the work force and increase their competitive advantage.

Observed Table 7, chairman, chief executive officer or general manager of the organization have above 10 years experience take up 28 per cent out of 36 per cent of both position total, head of department and other executive position have below 10 years working experience take up 52 per cent of total SMEs, so, more than half of the SMEs' executive has below 10 years in business.

Table 7: Respondents' Position And Working Experience

Position	Experience in business (years) 0-5	6-10	11-20	above 20	Total
Chairman, CEO	-	-	2	2	*4*
General Manager	-	9	13	11	*32*
Head of Department	9	11	4	2	*26*
Other Position	15	17	6	-	*38*
Grand total	**23**	**36**	**26**	**15**	**100**

Note: Number of per cent (%) of total respondents

SUMMARY OF FINDING AND INTERPRETATION

Further to the survey analysis, the affecting variables are extracted from "Level of e-commerce application to involve", "Benefits of adopting e-commerce", "Barriers of implementing e-commerce" and "Critical success factor regarding e-commerce" sections. Based on issues affecting e-commerce adoption, summarized the output in Figure 10.

The e-commerce market is still at a relatively infancy stage in Sarawak. When consider the e-commerce development, two important factors "Critical success factor" and "Barriers of implementing e-commerce" must be aware in order to have successful implementation.

Application Of E-Commerce

"Online ordering", "Electronic Advertising or Internet advertising" and "Online marketing or e-marketing" are the essential application on the internet in promoting e-commerce. This is the new channel of marketing, beside the traditional way of physically going to the store, via direct mail, phone or facsimile as media to reach everyone. SMEs in Sarawak see the prospect of this new way of doing business, by involving of these applications; they can virtually moving their products to the interested groups.

The use of the Internet for advertising or brand building has been addressed by a number of researchers. And this is one of earliest uses of the Internet for many of small organizations (Webb & Sayer, 1998). The study done by Jacobs and Dowsland (2000) also found that 30 per cent of SMEs in Wales were using the Internet for advertising and brand building.

Based on their pass records, the growth rate are slow, most of them cater for local market. Currently, the business is protected. But with the globalization, neighboring countries entrepreneurs can came in with larger scale of operation and tap the market. This may become unsecured for local SMEs. if they are resists to accept the change. Gaining competitive advantages, e-commerce is a new alternative to capitalized.
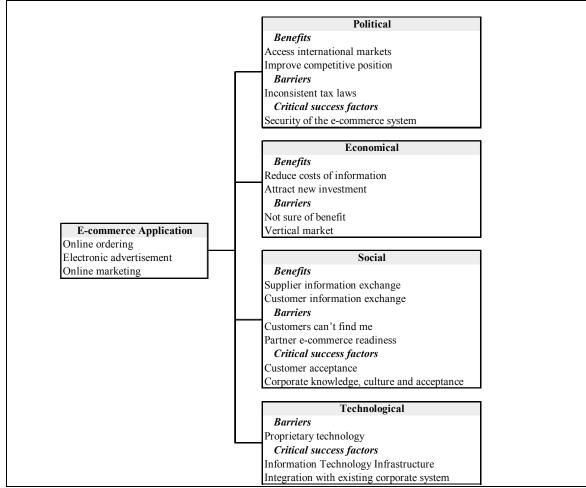
Figure 5: Summary Of Variables Affecting E-Commerce

From the surveyed top ten e-commerce application, it shows that the first step towards electronic based trading is computerized their existing accounting system. It automates the routine operations and immediate response to user inquiry on transactions history. Further to the accounting system, Human resource information system to manage employees on their activities, tracking and record, it can reflect their work performance, helping manager to delegate the right job to the right most capable person. Supply chain management system to get in touch with suppliers to know the responsive and supportive from suppliers, start from product information to after sales services. This is a typical opinion from the surveyed SMEs; it is a good opportunity for systems integrator to think along this direction, further study on their business requirements, expectation and design a solution to enable them to start e-commerce.

Political Issue Of E-Commerce Development

As agreed that the government support is the most important in promoting e-commerce, it is because most SMEs still do not posses the technological capability and ability to meet manufacturing standards specified by multi-national companies and large companies. "Adoption of ICT in Manufacturing Processes" is one of the technology development program implemented by SMIDEC, one of the government agency in promote the development of SMEs. Its new ICT related grant schemes consists of:
- grant for upgrading engineering design capabilities,
- E-manufacturing grant, and
- RosettaNet standard implementation grant.

Apart from SMIDEC's grant schemes, SMEs can also avail themselves of the "Technology Acquisition Fund (TAF)" and "The Commercialization of Research and Development Fund (CRDF)" offered by Malaysian Technology Development Corporation.

SMEs are strongly agreed with the security of e-commerce are critical to maintaining successful in e-commerce. Building trust and confidence in the electronic marketplace, it is including measures to ensure the authenticity of electronic documents, and the privacy and confidentiality of personal and corporate records. Beside that, Malaysian government does aware of this treat; it passed and tabled laws to guide e-commerce, which includes:
1. Computer Crimes Act 1997
2. The Copyright (Amendment) Act 1997
3. The Telemedicine Act 1997
4. The Digital Signature Act 1997
5. The Communications and Multimedia Act 1998
6. The Communications and Multimedia Commission Act 1998

Economical Issue Of E-Commerce Development

Capable of doing business internationally and globally, it is definitely can attract new investment or new prospect to the business; cost of data transmission will going down gradually, as the internet uses increases.

SMEs, not to mention small enterprises, face increasing obstacles in accessing these new markets, mainly due to current low level of ICT awareness. Entrepreneurs and manager are currently had difficulty understanding and using the potential of the internet. Indirectly, they need that knowledge to enable them to make the strategic choices for their ICT requirements.

More than half of SMEs are considered as small scale business, they are mainly family based businesses. "Lack of qualify personnel" and "Lack of business model" become the top priorities of the barriers. They can not afford to have everything to start their business. Outsourcing becomes an alternate for them to get started without having to invest a lot of capital and minimize the risk. Most of the older SMEs are "Not sure about the benefit", they are happy with what they have, and also not interested about this new technology.

On the downside of current global economic slowdown, insufficient knowledge workers and techno-entrepreneurs with business building skills, low Internet penetration (lack of immediate sizeable market), infrastructure, perceived high cost, being risk-averse (a "wait-and-see" attitude), and lack of willingness to embrace and champion change in the organization.

The key components on the impact of e-commerce on the competitive of SMEs are:
- Cost reduction, which is in turn a measure of organizational efficiency and financial controls;
- Turnover;
- Ability to retain existing clients and win new clients, which is in tern a reflection of SMEs ability to grow market share;
- Profitability.

The globalization of markets can be considered as a positive or negative trend. In any event, it is a development that we cannot ignore. Currently, globalization of the economy is increasingly privileging the offer, the large-scale economic and financial groups, and the on-going expansion of multinationals including the medium-sized sectors.

As long as e-commerce is principally business-to-business, these trends will only consolidate. The natural evolution towards business-to-consumer will instead hopefully lead to a gradual globalization of the final demand. This would mean a return to democracy, as it were, for the entire process of globalization.

Putting efforts to work towards a final scenario of e-commerce oriented to end consumers. This in turn implies winning the trust of consumers on the one hand, and setting in place the required structures and resources to respond to the needs of expanding markets on the other.
Social Issue Of E-Commerce Development

As shown in the results of the survey, "Supplier information exchange" and "Customer information exchange" are indicate as the benefits for SMEs of using e-commerce. It is supported by Sillince et al. (1998), O'Keefe, O'Connor and Kung, (1998), Roberts et al. (2001) on document exchange with customers or suppliers.

It is believed that the best organizations to initiate e-commerce are the manufacturer or wholesaler. They can encourage the use of internet for customer supports, eliminate unnecessary intermediate layers; the manufacturer can get direct feedback about their products or services direct from their user. This provide confident for retailers to join their extranet, it is also to obtain first hand information direct from the principal office. Extranet is a place to allow its own suppliers and customers for information exchange.

Without online marketing or electronic advertisement, "Customer can't find me" become the barriers. Partners may loss its competitiveness, if "Partner e-commerce readiness" is not there.

"Customer acceptance" and "Corporate knowledge culture and acceptance" is a key success factor of e-commerce. Technology always move faster than the culture, it take years for people to change the way they live.

The social impact of the introduction of e-commerce has never been fully evaluated, but it is an issue that certainly requires attention. It appears that the exodus from traditional sectors of mediation, distribution and retail more or less corresponds to new opportunities for new professions. But it's not the same people, not at the same moment, and not with the same qualifications.

For the regions with a high level of non-employed and unemployed, this fact is a significant and justified concern, and thus a hindrance to the development of e-commerce. But this can only delay its introduction, leading to a risk of emerging from international markets. Probably we rather need to carefully monitor this shift of the labor force, decode the new professions required, and train new specialized workers with the necessary "certified" skills as part of a permanent process with regular monitoring.

Technological Issue Of E-Commerce Development

Making decision to buy a computer for office use is very easy, most of them use personnel computer at work, notebook computer are getting popular. It is not like in an old days, decision of getting a computer is just like choosing a technology to work with. Users do not have much choice, to bind themselves into a specific "proprietary technology", and they don't have much option to switch to others. With the development of personnel computer, become faster and more powerful, many office are downsizing, uses of personnel computer to handle most of the office works, interoperability provide the flexibility of getting any hardware to work with. "Integration with existing corporate system" will not create many problems, and it is seem as an important aspect of e-commerce effectiveness (Keeling et al., 2000; Melymuka, 2000; Haapaniemi et al., 2000; Hoffman, 2001) and this is the beauty of having an open system.

It is particular important for SMEs to improve business and consumer access to the internet and to e-commerce. Currently, "Information Technology Infrastructure" still not adequate to enable e-commerce, high speed broadband internet access only available at major cities of Sarawak. Indirectly, it restricts the development. At this stage, it is good to strength themselves, when the infrastructure ready, they can immediately take off and fully running e-commerce.

Prospects Of E-Commerce For Smes In Sarawak

Currently, the cost benefit of going online may still be unclear for some businesses, which may be the cause for them to hold back. However, with technology improving rapidly and becoming more affordable while simultaneously, with labor and other costs of doing business the traditional way going up, the benefits of e-business will become more evident.
Other drivers of e-commerce adoption are globalization and liberalization as well as the government's efforts and support. Services industry may adopt e-commerce more easily compared to those which involve the sale of physical goods which need to be transported to or collected by the customer.

For those in the export/import businesses, e-commerce is a means to reach an even larger pool of customers/trading partners globally. Hence, they would not be dependent on the number of shoppers in Malaysia.
For the brick and mortar companies (e.g. banks), although online customers may currently be few in number, it is an additional distribution channel which may give it a competitive advantage by offering more choices to customers. Additionally, the company can gradually steer its existing customers to this low-cost channel in much the same way banks have steered customers from bank tellers to automated teller machines.

CONCLUSIONS

This study presents a significant and important survey to examine the adoption, development of e-commerce by SMEs in Sarawak. With regards to the potential opportunities, benefits perceived barriers or obstacles to the adoption and use of e-commerce based on feedback responded from survey. This does reflect their views and perception towards successful implemented e-commerce.

The level of interest and participation in this survey has shown that they believe in the potential of e-commerce with the technology availability, advancement and government encouragement should be able to overcome the barriers and minimize the risk. Most importantly, it indicates the impact of e-commerce and creates a strong confidence in its future development or facilitates a specific e-commerce process.

Recommended Actions By Individual SMEs

Use of technology can use to increase productivity. Internet getting more and more widely available, it can be use to search for most of the require information, products or services locally or globally. Vendors must aware of it and establish their own internet website to provide for their products information, supports, receive feedback direct from customers. Encourage users or resellers to inquire or register through their web, the vendors can provide direct and faster response to the groups or individual. With this is an easier, faster and cheaper way to keep in touch and enhance customer relationship. Local vendors or manufacturers are advice to take the lead and implement it.

With the help of e-commerce, it is not a problem to support overseas clients without physically presented at their site. It is encourage doing business locally and globally. But, they have local base market to support their product. This can become a good evidence for foreign investor to believe, interested to embark and invest on. Smart investors can easily obtain information via internet or other means.

For long term strategy planning, it will have great advantage to capitalize on e-commerce or related technologies. Today, the computer network communication cost has gradually reduced; computer hardware and software are getting more powerful and cheaper. Government and related bodies are working very hard on internet security and privacy issues. Computer application already can take over routine works, which is believed to be able to process more reliable, faster and cheaper. In this case, the management can spend less time tied up with routine operation, emphasis more on productive work like how to create more customers, increase sales volumes, and so forth. Remember that the wave of the future is flexible production and flexible organizations, managers need to balance between traditional cultural values and strategic business practices in order to use e-commerce as a competitive edge in the new digital economy.

As e-commerce followers, there are a lot of successful e-commerce examples for reference. With added the unique value by local SMEs, such as hard works, able to produce world class products with limited resources, attain the right level of competitions via lowering its business overhead, sharing research and development initiatives, sharing markets and develop collaborative exchange of information and resources. These goods characteristics should maintain and incorporate it as a local context in order to compete with large organization with plenty of resources.

For a quick start without worried too much on investing, SMEs can consider outsourcing their e-commerce to external systems integrators that has the technical infrastructure and expertise in design and manage the website more efficiently. Pay small sum of money and enjoy the full features of e-commerce system. The outsourcing trend had proven to be favorable in many places in Malaysia. Alternatively, SME's could consider forming strategic alliances or having joint ventures with local systems integrators who are capable of provide such solutions to achieve strategically significant objectives that are mutually beneficial.

Recommended Actions By Systems Integrators

With study references from success implementation cases, provides a guideline and example on typical solution for local SME. Because, in today context, it is must be more focus on outcomes in terms of performance rather than on the specification of inputs.

Further study on specific industry conditions and requirements, design and tailor a suitable system in meeting user expectation, increase productivity and reduce the total cost of ownership. And this is not like the traditional

information-processing model for traditional business processes assumes a problem as given, and the solution is based on pre-specified understanding of the business environment (Malhotra, 2000).

Provide an ease of use, and friendly interface to all users, it allow user to have more confidence to use the new system. An intelligent system can identify difference user behaviors; create different user profile to fit into individual characteristics. Beside that, the English-like questions for help inquiry, create user convenience to let user freely ask any question with accumulate user experiences, the system will pick the topics related to the question output the result ordered from the most to least appropriate. To get help on specific function, setting or error fixing, make available help with step by step guide to allow user to visualize the entire process, without engage additional help from external systems support personnel. The system can have self diagnostic mechanism, allow self recovery and restore the user data and configuration. All the above mentions features is use to suggest to system integrators in reducing unnecessary support when considering design a durable user system.

Most of the bank in Malaysia is providing on-line or electronic related transaction over the internet. The real e-commerce system design must be able to incorporate it and make it not just an online ordering system. Unfortunately, most of the local e-commerce website still did not incorporate the payment capabilities.

Beside that, assist SMEs to reduce their initial start up cost by helping them to obtain grant or subsidy from government or appointed government agencies, likes TAF or CRDF, to get start with e-commerce solutions. By building up a strong business-to-business or business-to-consumer extranet to connect buyers and sellers together; can have a strong relationship to keep all parties benefits in this virtual community.

Recommended Actions By Government And Agencies

Government have important role to play in the diffusion of e-commerce among SMEs as a way to improve firm competitiveness, overcome traditional barriers and improve access to new markets.

The most significant barriers appear to be a lack of awareness of e-commerce and uncertainty about its benefits. An action suggested to Sarawak state government in collaborations with local trade associations and chambers of commerce to promote the use of e-commerce through awareness campaigns like providing information through road shows and web sites, which can be directly or indirectly influence the provision of such service. As SMEs' adoption of e-commerce are depends on their perception of the opportunities afforded by e-commerce and the relevance of these opportunities to their business. There is a need for more hands-on, customized delivery of information, assistance and demonstration tailored to specific sectors needs or specific business functions, such as international market development, supply chain management and financial management.

Knowledge of best practice, what works elsewhere, is important in formulating policies to foster e-commerce. Current policies tend to be fragmented and rather tentative. Governments must gain better knowledge of how e-commerce can help SMEs, this involve the adoption of more comprehensive and consistent policy approach to SMEs and e-commerce in partnership with the private sectors.

By promoting the development of e-commerce for SMEs, government policies should focus on the development of information infrastructure including communication infrastructure and a legal enforcement system in protecting copyright and intellectual properties. This is to enhance sharing of knowledge and information between SMEs and business partnership. Lastly, it is believe and always agree that sufficient access to information infrastructure at reasonable and affordable cost is the fundamental for e-commerce to develop.

Further Research

This study examined e-commerce application to involve, benefits, barriers and critical success factors to adoption of e-commerce by SMEs from all industry sectors in Sarawak. It identified measures which participating SMEs believe should be taken by government and others to facilitate greater adoption of e-commerce by SMEs.

There are still gaps in the understanding of the opportunities and obstacles to the adoption of e-commerce and the interplay with structural conditions specific to SMEs, such as age, size, industry sector and regional location. It is recommends an in-depth study to evaluate the benefits and barriers to the take-up e-commerce by various mentions categories.

REFERENCES

Akkeren, J. V., & Cavaye, A. L. M. (1999). "Factors affecting entry level internet technology adoption by small business in Australia: an empirical study", in the proceedings of 10th Australian conference on information systems, pp.1079-1083.

Asian-Pacific Economic Cooperation. (1998). *Profile of SMEs in APEC Economies.* Retrieved January 23, 2004 from http://www.apecsec.org.sg/apec/publications/free_downloads/1998.html

Asian-Pacific Economic Cooperation. (1999). *SME e-commerce study*. PricewaterhouseCoopers.

Burgess, S. (1998). *Information Technology in Small Business in Australia: A Summary of Recent Studies*. Retrieved January 23, 2004 from http://www.sbaer.uca.edu/Research/1998/USASBE/98usa283.txt

Chambers of Commerce of Ireland. (2002). *Chambers SME E-Business Survey 2002.* Retrieved January 23, 2004, from http://www.chambersireland.ie/getFile.asp?FC_ID=6&docID=462

Department of Statistics. (2003). Banci *industri pembuatan tahunan, 2000 Sarawak.* Unpublished work.

Dutta, S., Lanvin, B., & Paua, F. (2003). Global Information Technology Report 2002-2003. *World Economic Forum*. Retrieved January 23, 2004 from http://www.weforum.org/pdf/Global_Competitiveness_Reports/Reports/GITR_2002_2003/GITR_Rankings.pdf

Economic Planning Unit. (2001a). The Eighth Malaysia Plan 2001-2005. Putrajaya: National Printing Department.

Economic Planning Unit. (2001b). The Third Outline Perspective Plan 2001-2010. Putrajaya: National Printing Department.

Economist Intelligence Unit. (2001, July 9). *Malaysia: Government leads in promoting e-commerce.* Retrieved January 23, 2004 from http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=3936

EIU ebusiness forum. (2000, May 4). *The EIU's e-business readiness rankings, May 2000.* Retrieved January 23, 2004 from http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=3331

EIU ebusiness forum. (2001, May 8). *The Economist Intelligence Unit/Pyramid Research e-readiness rankings*. Retrieved January 23, 2004 from http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=367

EIU ebusiness forum. (2002, July 12). *The Economist Intelligence Unit e-readiness rankings, July 2002*. Retrieved January 23, 2004 from http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=5768

EIU ebusiness forum. (2003, March 31). *The 2003 e-readiness rankings.* Retrieved January 23, 2004 from http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=6427

Foley, P., Sutton, D., & Jayawardhema, C. (1999). "Forecasts and Trends for Electronic Commerce". Ideal Publishing Group, pp241-247, proceedings of the 1999 Information Resource Management Association, Hershey, Pa USA, May 16-19.

Fraenkel, J. R., & Wallen, N. E. (1993). *How to design and evaluate research in education* (2nd ed.). Singapore: McGraw-Hill Book Co.

Haapaniemi, P., Huler, S., McDermott, M., & Benchley, R. (2000). Tuning up for e-commerce fast lane. Chief executive, leadership in the new economy, supplement, August, 20-25.

Hoffman, C. (2001). Built to move. *CIO – Chief Information Officer, 13*(16), 120-128.

IBM. (n.d.). *Glossary of computing terms*. Retrieved January 23, 2004 from http://www-3.ibm.com/ibm/terminology/goc/gatmst09.htm

Industry of Tourism and Resources. (2002). *The Impact of the Internet on Global Supply Chains*, Canberra, Australia: Department of Industry Tourism and Resources.

Iowa State University. (n.d.). *e-commerce*. Retrieved January 23, 2004 from http://www.iastate.edu/~PremCourses/ecomm1.htm

Jacobs, G., & Dowsland, W. (2000). The dot-com economy in Wales: The long road ahead. Conference proceedings of the 7th annual conference of UKAIS, United Kingdom: Swansea, April, 590-596.

Kalakota, R., & Whinston, A. B. (1997). *Electronic Commerce: A Manager's Guide.* MA: Addison-Wesley.

Keeling, K., Vassilopoulou, K., McGoldrick, P., & Macaulay, L. (2000). Market realities and innovation in small to medium enterprises: Facilitators and barriers to the use of electronic commerce. *New product development and innovation management*, *March/April*, 57-70.

Keenan, W. (2002). "SME and E-Commerce development", paper presented at InfoSoc Malaysia 2002, June 4-5, Sabah Malaysia. In CommerceNet (2001), "CommerceNet 2000 Survey: Barriers to E-Commerce 2000 study", http://www.commerce.net/research/barriers-inhibitors/2000/Barriers2000study.html

Latifah W. M. (2002). "Transition from P-economy to K-economy: Sarawak's Framework", paper presented at Sarawak in the 8th Malaysian Plan, Sarawak, Malaysia, August 13.

MacGregor, R.C., Bunker, D. J., & Waugh, P. (1998). "Electronic commerce and small/medium enterprise in Australia: an EDI pilot study", in the proceedings of 11th International bled e-commerce conference. Bled Slovenia June 8–10, pp.284-294.

Mahathir, M. (2001). "The 2002 Budget Speech" presented at the Dewan Rakyat, Kuala Lumpur, Malaysia, October, 19.

Malhotra, Y. (2000). Knowledge management for e-business performance: Advancing information strategy to "Internet Time". *Information strategy, the executive's journal, 16*(4), 5-16.

Mazlan, M. (2003). "Developing and promoting e-commerce through the MSC – The new engine of growth", paper presented at the workshop on e-commerce, Sarawak, Malaysia, June 24.

Melymuka, K. (2000). Survey finds companies lack e-commerce blueprint. *Computerworld, 34*(16), 38-42.

MSC Technology Centre. (1999). *National Electronic Commerce Strategic Directions.* Malaysia: Cyberjaya.

Multimedia Development Corporation. (n.d.). *National Electronic Commerce Strategic Directions under Borderless Marketing Department of Departments in About MDC.* Retrieved June 29, 2003 from http://www.msc.com.my/mdc/mdc/default.asp

Multimedia Development Corporation. (2004, January 13). MSC Facts and Figures. Retrieved January 23, 2004 from http://www.mdc.com.my/xtras/fact_figures/msc.asp

MYNIC. (n.d.). Total number of registrations to date (Jan 1995 - Dec 2003). Retrieved January 23, 2004 from http://www.mynic.net.my/newhp/mynic-reg-summary.cfm

Ng, W. P. (2003). "MSC Flagship Application", paper presented at the MSC Nationwide conference 2003, Sarawak, Malaysia, January 16.

Nua. (2001, July 13). *Taylor Nelson Sofres: Ecommerce stumbles in Malaysia.* Retrieved January 23, 2004 from http://www.nua.com/surveys/index.cgi?f=VS&art_id=905356973

O'Keefe, R. M., O'Connor, G., & Kung, H. J. (1998). Early adopters of the web as a retail medium: Small company winners and losers. *European Journal of Marketing, 32*(7-8), 629-643.

Organisation for Economic Co-operation and Development. (1999). *The Economic and Social Impact of Electronic Commerce - Preliminary findings, and research agenda*. Paris: Author.

Roberts, M., Moulton, M., Hand, S., & Adams, C. (2001). E-commerce utilisation in SMEs in South Wales. Information systems in the digital world, proceedings of the 6th Annual Conference of UKAIS, United Kindom: Portsmouth, April, 223-232.

Sillince, J. A. A., MacDonald, S., Lefang, B., & Frost, B. (1988). Email adoption, diffusion, and impact within small firms: a survey of UK companies. *International Journal of Information Management, 18*(4), 231-242.

Small and Medium Industries Development Corporation. (n.d.). *Definition in about us of SME Information & Advisory Centre*. Retrieved January 23, 2004 from http://www.smidec.gov.my/detailpage.jsp?section=aboutus&subsection=null&level=1

SMI Association of Malaysia. (n.d.). *Definition of SMI*. Retrieved January 23, 2004 from http://www.smisme.com/main_info/definition.htm

Taib, M. (2002). "Sarawak in the eighth Malaysia Plan (2001-2005):- Growth opportunities and challenges", paper presented at Sarawak in the 8th Malaysian Plan, Sarawak, Malaysia, August 13.

TechRepublic. (2000). *E-business fundamentals glossary*. Retrieved January 23, 2004 from http://www.techrepublic.com/download_item.jhtml?id=dr00520001006ggp01.htm

Tengku, M. A. S. (2002). "IT Industry Development Strategies in Countries around the World: The Malaysian Experience", paper presented at the World Congress on Information Technology (WCIT) 2002, Adelaide Australia, February 27 - March 1.

Turban, E., Lee, J., King, D., & Chung, H. M. (2000). *Electronic Commerce: A Managerial Perspective*. Upper Saddle River, NJ: Prentice Hall. p 451.

United Nations Conference on Trade and Development. (2001). *E-Commerce and Development Report 2001*. New York and Geneva: United Nations.

United Nations Conference on Trade and Development. (2002). *E-Commerce and Development Report 2002*. New York and Geneva: United Nations.

United Kingdom's National Statistics. (2002, August 22). *2001 e-commerce survey of business, United Kingdom*. Retrieved January 23, 2004, from http://www.statistics.gov.uk/pdfdir/ecom0703.pdf

Webb, B., & Sayer, R. (1998). Benchmarking small companies on the internet. *Long range planning, 31*(6), 815-827.

An Empirical Study on Consumer Motivations to E-Buying

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ABSTRACT

Electronic commerce (E-Commerce) has pervasively and dramatically affects the way firms think, operate, and compete in the market and also has already improved business value by fundamentally changing the way products are conceived, marketed, delivered, and supported in order to capture consumers awareness and interest. Understanding online consumers (i.e. the secondary stakeholder of an online firm) has become the focus of attention in the electronic business (e-business) world due to the fact that the prosperity of online companies and its survival is heavily dependent on satisfying online customers and keeping them loyal. The E-Commerce offers online consumers a wider range of benefits that cannot be underestimated, such as finding the products which are not available locally and reducing Internet users' search time for products and services. These factors have an impact on emerging trends of Electronic Commerce in Malaysia. This study focuses on providing a deeper insight into the factors that may motivate Malaysian Internet users' browsing or purchasing habits with respect to products and services. Factor analysis was performed to examine the reliability and validity of the variables relevant to Internet users' e-buying motivational factors. The implication of the study is then discussed.

INTRODUCTION

The world is moving rapidly towards Electronic Business (E-Business) and Electronic Commerce (E-Commerce) activities. It was predicted that e-commerce would generate the worldwide revenue as high as 6.9 trillion dollar in 2004, and the number of Internet users would grow as high as 765 million users in 2005 (CommerceNet, 2003). Malaysia needs to take cognisance of these trends and react quickly in order to be an active participant in the emerging electronic world and to reap the benefits of E-Commerce. However, little information is known about Malaysian Internet users' motivational factors with respect to e-buying or also known as online shopping. The study specifically focuses on Malaysian Internet users' e-buying behaviour with regards to motivational factors that supports their e-buying behaviour. Thus, this study concentrates on Business to Consumer (B2C) market.

LITERATURE REVIEW

The number of consumers buying online and the amount being spent by online buyers recorded an unprecedented global growth. It has been reported that online spending in 2002 has increased tremendously around the globe, especially during the holiday seasons. Some countries recorded positive growth of online users, with more consumer products having been purchased through the Internet. In 2002, the US Consumers spent nearly USD13.7 billion online during the holiday seasons up from USD11 billion in 2001, according to Goldman Sachs, Harris Interactive and Nielsen-Netratings. The research indicated that consumers spent more than 16 percent of their holiday budgets on online purchases in 2002, compared to 14 percent in 2001 (cited in http://www.matrade.gov.my/ecommerce/news-archive/2003/ecom-012003.htm).

The similar study found that the best performing category was books, music, and video/DVD with consumers spending more than USD3.1 billion, up 40 percent on the preceding year. Apparel spending rose 20 percent to USD2.7 billion, while consumers spent nearly USD2 billion on travel. The figures also revealed that women comprised 51 percent of the total online shopping population during the 2002 holiday season, as compared to 49 percent of males, while shoppers aged 18-24 years accounted for 17 percent of the online shopping population (cited in http://www.matrade.gov.my/ecommerce/news-archive/2003/ecom-012003.htm).

Norazah, (2001) conducted study on Malaysian Internet users adoption and behaviour on shopping online in 2001 found that there were 579 randomly selected respondents in the study, out of which 229 were Internet Shoppers; that is those who have purchased products or services through the Internet, and the dominant party were "Male" respondents. The study indicate that Internet Shoppers who own a credit card enjoyed purchasing

books/journals/magazines through the Internet, especially books at the price of less than RM 100 per item and at the similar time perceive that their level of satisfaction is higher for the item purchased through online. In most of the cases, the delivery is also made within seven days from the date of order and settled their online payments using credit card. Also, they intended to conduct repeat purchases in the near future and with a maximum amount of money expenditure is also less than RM 500 per transaction. They also reported they enjoyed browsing the Internet for "less than three hours a day" for personal purchasing reasons.

Interestingly, findings by Taylor Nelson Sofres, (2002) revealed that the penetration of Malaysians shopping online, i.e. people who bought or ordered goods and services online in 2002, was 1% of the total adult population in Malaysia. This corresponded to 3% of the Internet users in the country. Specifically, 21% of the total adult population in Malaysia are Internet users in 2002 (Please refer Figure 1). Males were the dominant Internet users, i.e. 28% of the total population, while 15% were females. The proportion of adult population that used Internet was the highest amongst the group of less than 20 years old (37%) followed by the group of 20 to 29 years olds (34%). The study found that 7% of Malaysian Internet users planned to buy or order goods or services online by the end of 2002.
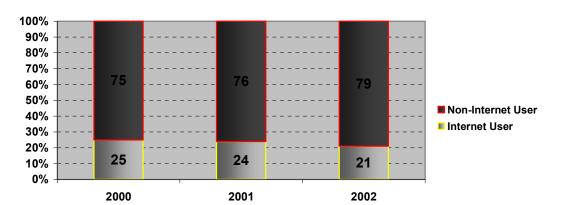
Figure 1: Percentage of Population Who Are Internet Users

Source: TNS Interactive (2002). Global eCommerce Report 2002.

There is high demand for e-buying among Malaysians Internet users conducting online shopping due to E-Commerce providing enormous potential benefits that cannot be underestimated for consumers worldwide. Wider choice ranges, lower prices, and entirely new products have become made available in many product categories such as books, CDs, and travel packages, to consumers who are physically far away from the world's centers of traditional commerce. Furthermore, the Internet users could receive more attractive sales promotional offers from Internet sellers and also through individual e-mail accounts.

Electronic Commerce also enhances flexibility and convenience. Convenience is a key motive behind in-home shopping (Eastlick and Feinberg 1994). Convenience is measured by timely delivery, ease of ordering, and product display. Consumers can enjoy window-shopping on the Internet without the pressure to purchase, unlike the traditional shopping environment. Consumers are able to initiate and control non-linear searches, due to the interactive nature of the Internet and the hypertext environment. For example, Swaminathan et al., (1999) in his study found that consumers who are primarily motivated by convenience are more likely to make purchases online. Meanwhile, those who value social interactions are less interested in the Internet use for shopping and thus shop less frequently on the Internet and spend less money on E-Commerce.

The ability of online shopping to cater to social experiences outside the home, without actually leaving home, offers a distinct advantage for those unable or unwilling to venture out to physical locations, as well as offering social support (e.g. Kang & Ridgway, 1996). Kozinet (1999) prescription for marketers to follow a membership strategy as a way of rewarding loyal customers, through access to a desirable community, not only builds on these social motivations, but also suggests that membership can provide elevated status in a meaningful virtual community, thus satisfying another social motivation. Beside convenience factor and socialisation factor, time delivery is also the single most important feature that improves the satisfaction of online shopping (Kim, 2002).

METHODOLOGY

Questionnaires were developed to determine the extent of Internet users' motivation factors when browsing or purchasing through the Internet and also their personal background. Variables are chosen based on several researches done in other countries such as United States, United Kingdom (Korgaonkar & Wolin, 1999; Phau & Poon, 2000).

Respondents in this study were chosen at random at various locations such as cyber cafes, higher learning institutions' labs, and shopping malls. Out of 800 respondents, there were 579 respondents to this survey; 161 respondents from Penang, 241 respondents from Selangor and 177 respondents from Kuala Lumpur, the metropolitan city of Malaysia, out of which 334 were "Male" and the balance were "Female". They were selected from the Business to Consumer (B2C) market segment's population but only those who met the condition of having had experience in browsing or purchasing through the Internet were considered for the sample. They were drawn from different occupational categories, education, age, gender or ethnic categories but all of them fulfilled the basic condition mentioned earlier. The majority of respondents (472) in the age group of "less than 30 years old", were mostly Malays. It can be noted that in the sample, 40% of the respondents were "students" from university community such as undergraduates and MBA students. The results showed that more than half of the total respondents (63%) earned a salary of "less than RM 3,000" per month. Most of the respondents work/study in "Selangor" which represents 42% of total respondents, followed by 31% in "Kuala Lumpur". This study applied a stratified random sampling technique as a sampling method.

After the survey was administered, the data were assessed for reliability and construct validity using Cronbach Alpha coefficient (Nunally 1978). The construct validity for this research was established using factor analysis; a multivariate technique which would confirm the dimensions of the concept that have been operationally defined, as well as indicated which items were most appropriate for each dimension. Factor with eigenvalues greater than 1.00 and factor loading greater than 0.30 were considered to have adequate convergent validity (Zeller and Carmines, 1980). Data in this study were analysed using Statistical Package for Social Science (SPSS) Version 10.0.

DATA ANALYSES & FINDINGS

Cronbach coefficient alpha was used to assess the reliability of a multi-item measurement scale of the items interrelated to motivational factors. In the current study, it was found that motivational factors had coefficient alpha of 0.9478 which exceeded the recommended value of 0.70 by Nunally (1978). Thus, it is reliable for further analysis. Since the items were numerous, Factor Analysis was carried out in order to identify the underlying factors and a smaller set of important variables relevant to Internet users' motivational factors. The data analysis and interpretation of the motivation are given as follows and also stated in Appendix A.

Accessibility

The most important motivational variable when browsing or purchasing through the Internet rated by the 579 respondents was "Accessibility". "Instant access to detailed information" was eliminated from this factor because its factor loading is lesser than the fixed criteria of 0.50, causing variable 1 to comprise of ten statements with 14.548% of variance. The eigenvalue for this variable was 13.268. Out of the ten statements, the statement "easy access to wider information" was the most important statement with a loading of 0.805. The next highest statement was "faster access to latest information" which constituted 0.780 factor loading. This was followed by "the best source to search for information" with a loading of 0.668. The Internet benefit of "reduce need for intermediaries" was cited as the least important item in this variable with a loading of 0.537.

Reliability

The second variable was categorised under "Reliability" which accounted for 13.624% of variance. The eigenvalue for this variable was 3.186. The statements "web pages are visually attractive" and "convenient order cancellation process" had been eliminated from this study due to their factor loading are lesser than 0.50. Thus, variable 2 yielded with seven elements. From the results obtained, it showed that "freight charges clearly stated" was the most important element in this section with 0.814 factor loading compared to six other elements. Whereas, the second important element was "prices of product clearly stated" with a loading of 0.807. However, 0.507 factor loading was accounted in the statement "web pages are loaded faster".

Convenience

The next group of dimension is related to "Convenience", consisted of six statements with 10.546% of variance. The eigenvalue for this variable was 1.821. Shopping convenience is acknowledged to be the primary motivating variable in consumer decisions to buy at home (Gillett, 1976). It included the time, space and effort saved by a consumer and it included aspects such as an ease of placing and cancelling orders, returns and refunds, timely delivery of orders (Gehrt, Yale and Lawson, 1996).

All of the items in this variable had factor loading greater than 0.50, with the exception of one item, i.e. "faster source of getting product information" because had a loading of less than 0.50, therefore, it was eliminated from this variable. The least important statement for variable 3 was "more product variety for selection" with a factor loading of 0.501. However, the most important statement claimed by the respondents was "no crowd of people shopping", with factor loading accounted for 0.798. This was followed by 0.743 factor loading in the next statement of "no traffic jam".

Distribution

There were four statements that were loaded in this variable. The statement "no stress from customer service people" was eliminated because it did not reach the criteria of factor loading of greater than or equal to 0.50, which constituted of 9.204% of variance. Eigenvalue for this variable was 1.531.

The most important statement in this variable was "orders are delivered in good condition" with the highest loading of 0.752. This is followed by "better product return service" with a loading of 0.747. The statement "orders are delivered on time" rank in third place with 0.716 factor loading. Whilst the statement "more convenient shopping on the Internet" is the least important statement in "Distribution Motivational Factor" with a factor loading of 0.598. Most of the attributes relate to distribution pattern of online shopping, therefore this factor is called "Distribution Motivational Factor".

Socialisation

The fifth variable grouped dimensions related to "Socialisation" which accounted for an additional 3.175% of the variance. The eigenvalue for this variable was 1.375.

Of the three elements selected in Socialisation, the most important variable was that they "could have foreign friends" with a loading of 0.795. The next statement was they "could practice foreign languages by communicating with people from other countries". This also had the same factor loading of 0.795. The least important element pertaining to this variable was to "allow unrestricted discussion of current issues" which constituted a loading of 0.580.

Searchability

Variable six describes "Searchability" which accounted for an additional 1.978% of variance from variable 5. However, there were only two statements which resulted in this variable and the most important element claimed by respondents was "owning a credit card" which had a loading of 0.672. This is followed by "need few movement to find product" which had a loading of 0.586. Eigenvalue for this variable was 1.088.

Availability

The final variable in motivation was "Availability", which consisted of only one statement with 3.399% of variance. The statement "availability of products on the Internet that cannot be found locally" had a loading of 0.500. The eigenvalue for this variable was 1.065.

CONCLUSION

Factor Analysis revealed that seven important motivational variables such as accessibility (the most important variable when shop online), reliability, convenience, distribution, socialisation, searchability, and availability were extracted, which accounted for 61.402% of total variance. Of the 38 elements, 33 elements which pertain to these variables were selected. A review of the eigenvalues and factor loading indicated that all of these

variables were appropriate for further analysis and the model possessed convergent validity (i.e. the extent to which a measure correlates highly with other measures designed to measure the same construct, Churchill, 1979).

As a summary, Internet Shoppers could gain the ability to search for products not on display, gather in-depth information without taking up the salesperson's time, and even purchase or pay for products for immediate or subsequent delivery, when conducting e-buying or online shopping. Beside that, in order to retain existing Internet shoppers, order processing on the Internet should be easy for customers to do; moreover, receiving order confirmations via e-mail, including information about shipping, returns, and order tracking numbers, facilitates order-processing behaviour. If order processing is time consuming and complicated, customers will likely become frustrated and give up purchasing from e-tailer. Therefore, electronic transactions should be easy, reliable, secure, and trusted in order to attract and maintain existing users of the Internet. Such measures would increase Internet users confidence on the credibility of Internet sellers.

Moreover, by understanding consumers attitudes specifically their motivational factors toward e-buying, it can help marketing managers and online retailers predict the online shopping rate of adoption and evaluate the future growth of online commerce. It is thus important to recognize that numerous motivational factors precede attitude formation and change of consumers regarding e-buying. Future researchers should study other new variables, besides the variables mentioned in this study, such as reluctance to change, security and privacy.

REFERENCES

Churchill, G. A. Jr. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16(2), 64-73.

CommerceNet, (2003). Who's on the net and who's buying?. [Online]. Available: http://www.commerce.net/research/r...ite_papers/nielsen97/overview.htm [2004, April 15].

Eastlick, Mary A. and Richard A. Feinberg. (1994). Gender Differences in Mail-Catalog Patronage Motives. *Journal of Direct Marketing*, 8(2), 37-44.

Higher Online Spending Recorded in 2002. [Online]. Available: http://www.matrade.gov.my/ecommerce/news-archive/2003/ecom-012003.htm. [2003, May 7].

Ian, Phau and Sui, Meng Poon (2000). Factors influencing the types of products and services purchased over the Internet. Internet Research: Electronic Networking Applications and Policy, 10(2), 102-113.

Kang, Y.S., Ridgway, N.M. (1996). The importance of consumer market interactions as a form of social support for elderly consumers. *Journal of Public Policy and Marketing, 15, 1, 108-17.*

Kargoankar, P. And Wolin, L. D., (1999). A Multivariate Analysis of Web Usage. *Journal of Advertising Research*, 39(2) Mar/Apr 53-68.

Kim, E.B., Eom. S.B. (2002). Designing effective cyber store user interface. Industrial Managemant & Data System, 102.5.241-51

Kozinets, R.V. (1999). E-tribalised marketing?: The strategic implications of virtual communities of consumption. *European Management Journal*, 17.3.252-64.

Norazah, M. S. (2003). Internet Users' Behaviour and Adoption in Purchasing Products and Services via Virtual Storefront. *Malaysian Journal of Consumer & Family Economics*, Vol. 6, September.

Nunally J. C. (1978). Psychometric Theory, Second Edition. McGraw Hill New York.

Swaminathan, V., White, E. L., Rao, B. P. (1999). Browsers or buyers in cyberspace? An investigation of factors influencing electronic exchange. *Journal of Computer Mediated and Communication*, 5 (2) Dicember 1-24. [Online]. Available://www.ascusc.org/jcmc/vol5/issue2/swaminathan.htm [2004, June 10].

Taylor Nelson Sofres. E-Commerce stumbles in Malaysia. (2002). [Online]. Available: http://www.nua.ie/surveys/?f=VS&art_id=905356973&rel=true. [2004, May 13].

Zeller, R. A. & Carmines, E. G. (1980). Reliability and Validity. Cambridge University Press New York.

APPENDIX A: Internet Users' Motivation Factors

Variable	1	2	3	4	5	6	7
Easy access to wider	.805						
Faster access to latest	.780						
The best source to search for	.668						
Cheaper source of	.667						
Can customise level of detailed require	.596						
Can download free software on the	.595						
No restriction in browsing	.587						
Can browse Internet for 24 hours a every day	.550						
Broad range of products available on Internet	.550						
Reduce need for	.537						
Shipping cost clearly		.814					
Product prices clearly		.807					
Special offers clearly		.751					
Customer service contact number stated		.732					
Web pages are updated		.626					
More interesting sales promotional		.574					
Web pages are loaded		.507					
No crowd of people			.798				
No traffic			.743				
No hassle of queuing to counter payment			.733				
Reduced waiting time for products			.578				
Convenient ordering			.503				
More product variety for			.501				
Orders are delivered in good				.752			
Better product return				.747			
Orders are delivered on				.716			
More convenience shopping on the				.598			
Can have friends from foreign					.795		
Can practice use of foreign communicating with people from countries					.795		
Allows unrestricted discussion of issues					.580		
Owning a credit						.672	
Need lesser movements to find						.586	
Availability of products on the Internet cannot be found							.500
Total Initial Eigenvalues	**13.268**	**3.186**	**1.821**	**1.531**	**1.375**	**1.088**	**1.065**
% Rotation Sums of Squared	**14.548**	**13.624**	**10.546**	**9.204**	**6.029**	**4.051**	**3.399**

The Future Role of Intermediaries: A Study on Malaysian Travel Agencies

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ABSTRACT

This paper reports an investigation into the adoption of the Internet amongst Malaysian travel agencies as a means of exploring the likely future role of intermediary. Realizing the threats of "disintermediation", this study explores the potential threats and opportunities faced by the agencies due to the emergence of Internet-based e-commerce technology. Despite the fact that the Internet usage is limited among the Malaysian travel agencies, their traditional roles as intermediaries have not been highly affected. The emergence of the technology was not critically perceived to jeopardize their role as middlemen. In a way, travel agencies tend to believe that technology has brought them an opportunity to evolve and innovate their business strategies in the industry.

OVERVIEW

The advancement of technology in the market has transformed industry structure and the means of conducting a traditional business. The emergence of commercial facilities due to rapid development of the Internet has brought a major breakthrough in the form of modern and new ways of conducting businesses. Internet has provided businesses with a range of new opportunities and new tools such as offering cheap marketing to a wider target market, selling and customizing products and services and enabling access to a range of databases which can provide up-to-date information on market and trends (Lawrence, Corbitt et al. 2000; Turban, Lee et al. 2000). It leverages a new marketplace that matches buyers and sellers with increased effectiveness, facilitating transaction at lower cost to a more efficient "friction-free" market (Bakos 1998). The relationship between buyers and suppliers has become closer as the technology allows cheaper access to both parties. The sellers or producers are able to address the needs of individual customers to offer personalized products and services. On the other hand, the buyers can have the advantage of having the freedom to choose or buy products according to their own special needs and requirements.

The travel agency provides an interesting case for researchers to study the possibilities offered by Internet based e-commerce technology. It plays an important role as intermediaries between suppliers and customers within the travel industry by adding value to the travel products and services offered which indeed provides benefits and convenience to both parties. Apart from that, the travel and tourism industry has been greatly affected by the rapid growth of the Internet and e-business technology. It was regarded as the first area likely to do business electronically and is predicted to become a highly successful online business area.

In addition, the role of middlemen was no longer seen important due the emergence of the Internet technology. It has potentially able to replace the major functions of middlemen or intermediaries.   Hence, total elimination of the intermediaries may occur and the relationship between buyers and sellers will become closer. How serious could the role of intermediaries be threatened by the Internet technology?

The aim of this project is to investigate the perceived impact of the Internet-based e-commerce technology on the role of Malaysian travel agencies.

- The adoption of the Internet based e-commerce technology among Malaysian travel agencies will be explored.
- The potential threats and opportunities faced by Malaysian travel agencies due to the emergence of Internet-based e-commerce technology will be studied.
- The agencies' perception and attitude on e-business towards their company will be investigated.

The significance for conducting this research is to understand where Malaysian travel agencies stand with respect to the emergence of the Internet based e-commerce. Apart from knowing the level of their electronic usage, it is relevant to predict how ready and optimistic they are towards the technology used, as a mean to sustain their intermediary role in a competitive environment.

A study of disintermediation on Malaysian travel agencies has not yet been explored by researchers. This potentially allows the researchers an opportunity to explore the new dimension of IDR model in the context of the Malaysian travel industry. The outcomes are likely to generate a better understanding and predictions of the potential for e-business opportunities within Malaysian travel agency industry in near future.

This research will focus on travel agencies in Malaysia, both in the west and east regions. The travel agencies selected will be classified under "ticketing" agencies where their main role is to offer airlines bookings and reservations, and to issue international or domestic flight tickets to customers.

LITERATURE REVIEW

The elimination of middlemen or most recently known as disintermediation has become quite a debatable issue among previous researchers (Bailey and Bakos 1997, Bloch and Segev 1997, Buhalis and Licata 2001, Stamboulis and Skayannis 2002, Chircu and Kauffman 1999). The scenario of disintermediation is when an intermediary gets pushed out by other firms, or when the service it provides becomes irrelevant when other ways to do transactions become available. Due to the advancement of information technology, the needs of intermediaries are regarded less important because their role now is replace by technology which, shall radically reduced the time and cost of processing and communicating information (Chircu and Kauffman 1999).

Most traditional physical markets are often brokered by intermediaries or middlemen that facilitate market transactions by providing intermediation services (Bailey & Bakos 1997). The new innovation of technology and the transformation of new digital markets would result in the decrease of transaction cost between buyers and sellers that will ultimately eliminate the role of intermediaries. (Gates 1995, Gellman 1996). The emphasis on electronic brokerage impact was pointed out where buyers and suppliers will be able to liase conveniently, quickly and inexpensively (Malone, Yates and Benjamin 1987). The role of traditional intermediaries was threatened as the technology encourages the establishment of 'one-to-one marketing' strategies. Both market players will have the advantage of coordinating transactions; information sharing and processing directly to reduce costs and thus traditional intermediaries will no longer be needed.

Bakos' (1998) later research illustrated the impact of intermediary's roles due to the emergence of Internet-based electronic marketplaces. It shows that information technology has the ability to perform and replace the above traditional intermediaries' functions more effectively and efficiently. The author however disputed on the argument that traditional intermediaries will totally be eliminated in the near future. A study on intermediation characteristics of thirteen firms has supported the argument (Bailey and Bakos 1997). The future role of traditional intermediaries is very much depending on the nature of the electronic markets. Hence, new electronic market will not eliminate intermediaries, as their services are needed, albeit in a way that differs from their traditional role in the physical markets. It shall either allow them to maintain their traditional role of physical intermediaries or indeed be eliminated but emerge as a new role as electronic intermediaries.

Bailey and Bakos' explanation is in line with the IDR conceptual framework introduced by Chircu and Kauffman (1999). Chircu and Kauffman interpreted the terms value appropriability, where firms are capable of capturing profits consistent with innovation it offers in its marketplace. The development of new technology should be acquired together with the existing assets in order to sustain their role as intermediaries. Their interesting framework of "IDR cycle" was in line with the idea of the emergence of new electronic intermediaries or eMediaries (Bailey and

Bakos 1996, Buhalis and Licata 2001). "I" stands for intermediaries, "D" for disintermediation and "R" for reintermediation. The conceptual framework was introduced on the basis of the situation where intermediation, disintermediation and reintermediation occur in association with the emergence of the Internet. It is argued that due to the emergence of information technology, the role of traditional intermediaries where first being threatened will therefore lead them to be totally eliminated. This scenario is described as disintermediation. However, these intermediaries who have been disintermediated or pushed out from a market niche however will re-established by value adding their roles via the deployment of new technology. Hence, instead of being disintermediated, the intermediaries will emerge as new roles and functions known as reintermediation.

RESEARCH METHODOLOGY

A survey shall be conducted in this study. The population in this study consists of registered travel agencies which are classified as "ticketing agencies." There are approximately 800 agencies, and a subset of 217 samples will be selected using proportionate stratified sampling. The population will be divided into several homogeneous groups, stratified by whether there are independent agent, franchise, parent or subsidiary company (i.e. type of business). And the sampling frame will be based on the listing of registered travel agencies on MATTA website. The participants in the study are mainly holding senior positions such as Chief Executive Officer, Managing Director and Manager of the company.

Data collection techniques encompass questionnaires and structured interviews. A questionnaire is structured into several sections to reflect the objectives of the survey. The sections include company profile, knowledge on e-commerce, Internet usage and their perceptions towards e-commerce application. An interview will be done randomly on selected numbers of (major) travel agencies only in order to gain their views of the technology.

Statistical Software for Social Sciences (SPSS) will be used to analyse the quantitative data collected from the survey questionnaires. The data will be analysed mainly using a frequency and cross-tabulation analysis. Qualitative data gathered from conversations will be tape-recorded and transcribed manually using Microsoft Word. Some common words or sentences will be selected and input into table before labelling them into their own interpretation.

FINDINGS

Company's Profile

Table 1 shows that the majority of the companies in the study are the parent companies (61%). About 18% of the companies are independent and 16% are franchise companies. Only 5% are the subsidiary companies.

Table 1: Profile of Firms Surveyed

Category	Frequency	Percentage
Independent	21	18.3
Franchise	18	15.7
Parent company	70	60.9
Subsidiary company	6	5.2
Total	115	100.0

Table 2 indicates that about 72% of the companies reported to employ less than or equal to 25 workers. About 19% employed between 26 to 35 workers while about 9% employed more than 36 workers.

Table 2: Numbers of Workforce Employed

No of workforce	Frequency	Percentage
6 – 15	31	27.0
16 – 25	52	45.2
26 – 35	22	19.1
36 – 45	10	8.7
Total	115	100.0

The respondents' customers are divided into two categories; 54% are local customers and 46% are from overseas (table 3).

Table 3: Descriptive Statistics for the Major Customers

Type of Customers	Frequency	Percentage
Local	62	53.9
International	53	46.1
Total	115	100.0

Figure 1 shows the distribution pattern of Malaysian travel agencies that were established since 1969. Based on the results, 70% of the agencies interviewed are appointed by the International Air Transport Association (IATA).
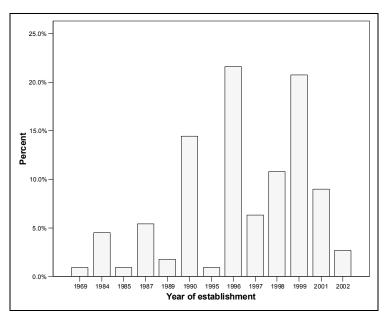
Figure 1: Year of Establishment of the Companies

Level Of Participation In E-Commerce

High percentage (65%) of respondents still do not have a company's website. 35% of the agencies use the Internet technology for emailing (46%), retrieving information (32%), advertising products and services (14%) online transaction/purchasing (5%) and scheduling for meeting (4%).
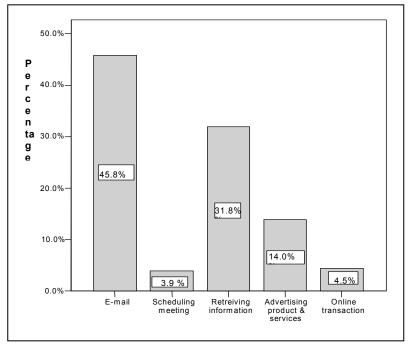
Figure 2: Status of Internet Usage

Respondents tend to agree with all the factors listed below due to the impact of Internet as the mean scores show less than 3.0 (table 4). Nevertheless, 58% of the respondents are neutral about the security issue due to the usage of Internet.

Table 4: Responds Toward the Impact of Internet

Statement	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)	Mean
Flexible and convenient	80 (69.6)	16 (13.9)	19 (16.5)	0 (0.0)	0 (0.0)	1.46
Increased penetration of customer	7 (6.1)	63 (54.8)	45 (39.1)	0 (0.0)	0 (0.0)	2.33
Lower distribution cost	0 (0.0)	45 (39.1)	43 (37.4)	27 (23.5)	0 (0.0)	2.84
Provide good customer service	11 (9.6)	64 (55.7)	32 (27.8)	8 (7.0)	0 (0.0)	2.32
Lack of human personal touch	0 (0.0)	113 (98.3)	2 (1.7)	0 (0.0)	0 (0.0)	2.01
Security fears	0 (0.0)	32 (27.8)	67 (58.3)	16 (13.9)	0 (0.0)	2.86
Language barrier	0 (0.0)	52 (45.2)	14 (12.2)	49 (42.6)	0 (0.0)	2.97

Based on the mean scores in table 5, their satisfactory level on Internet usage are positive with high percentage on searching on information for travel (96%), easy access on company's information (83%), improving their business process (78%), creating new business opportunities (77%) and facilitating communication (74%). The least satisfactory level are reducing paperwork (33%), enhancing staff productivity (22%), extending global market reach (22%) and improving organizational task (17%).

Table 5: Satisfaction Level of Internet Usage

Statement	Strongly satisfied (1)	Satisfied (2)	Neutral (3)	Dissatisfied (4)	Strongly dissatisfied (5)	Mean
Improving business process	69 (60.0)	21 (18.3)	25 (21.7)	0 (0.0)	0 (0.0)	1.62
Facilitating communication	58 (50.4)	27 (23.5)	30 (26.1)	0 (0.0)	0 (0.0)	1.75
Easy access for customers for company information	27 (23.5)	68 (59.1)	20 (17.4)	0 (0.0)	0 (0.0)	1.94
Searching information on travel	75 (65.2)	35 (30.4)	5 (2.8)	0 (0.0)	0 (0.0)	1.39
Reducing paperwork	7 (3.9)	52 (29.1)	56 (31.3)	0 (0.0)	0 (0.0)	2.42
Improving organizational task	0 (0.0)	31 (17.3)	78 (43.6)	6 (3.4)	0 (0.0)	2.78
Enhancing staff productivity	0 (0.0)	25 (21.7)	85 (73.9)	6 (3.4)	0 (0.0)	2.86
Extending global market reach	10 (8.7)	15 (13.0)	90 (78.2)	0 (0.0)	0 (0.0)	2.69
Creating new business opportunities	10 (8.7)	79 (68.6)	16 (13.9)	10 (8.7)	0 (0.0)	2.22

Respondents are highly pessimistic about customers stop visiting their premises due to the emergence of e-business (72%) and will fully adopt e-business technology in the near future (69%). They tend to be moderate on the issues where their customers will adopt e-business in arranging their own travel plan and the danger of e-business towards their role as intermediary. However, 66% of the respondents are optimistic about the positive impact that e-business will bring to their company.

Table 6: Perceptions toward E-Business

Statement	Strongly Optimistic (1)	Optimistic (2)	Moderate (3)	Pessimistic (4)	Strongly Pessimistic (5)	Mean
Malaysian travellers will adopt e-business for travel arrangement	0 (0.0)	28 (24.3)	61 (53.0)	26 (22.6)	0 (0.0)	2.98
Customers will stop visiting premise if they have better alternative of purchasing the travel product online	0 (0.0)	13 (11.3)	19 (16.5)	83 (72.2)	0 (0.0)	3.61
E-business will endanger the role of travel agencies as middlemen	0 (0.0)	24 (20.1)	64 (55.6.)	27 (23.5)	0 (0.0)	3.02
E-business will bring positive impact / benefits to company	9 (7.8)	67 (58.3)	32 (27.8)	7 (6.1)	0 (0.0)	2.32
E-business will be fully adopted by travel agencies in the near future	0 (0.0)	15 (13.0)	22 (19.1)	79 (68.6)	0 (0.0)	3.58

A question was asked about their main preferences on investment towards their company if they were given some budget allocation. Figure 3 shows that they prefer to give better incentive to their staff as their main preference (30%) and 26% will invest for promotion and advertisement on their company's products. Only 23% decided to invest on ICT and e-business technology.
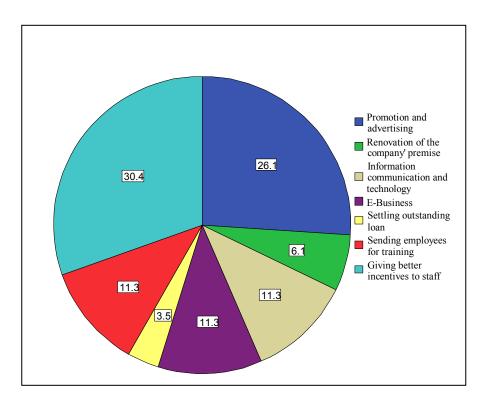
Figure 3: Investment Preference

DISCUSSION

Currently, most travel agencies are using the Internet for sending email, retrieving relevant travel information and advertising their products and services. Positive responses were based on the way the Internet assisted travel representatives to access relevant travel information at any time and anywhere around the globe. The effectiveness of the Internet was therefore most evident in providing reliable, up-to-date and timely travel information. Hence, the purpose of using Internet was to improve their internal tasks in order to offer better products and services to their current and potential customers.

The awareness of their existing role to be eliminated by the technology was not their main concern either. Although the lacking of "human personal touch" is becoming the agencies' main concern, they still strongly believe that their role could not be totally eliminated. One main reason is because they can perceive themselves as part of the main contributors toward the growth of travel industry in Malaysia. They are highly optimistic about their role as middlemen with regards to the emergence of e-business. The flexibility in terms of giving advice, amending travel booking and accepting last minute booking services provided by the agencies are the key factors that help them to sustain their role in the industry. The flexibility of services offered by the agencies could be quite challenging if tourists or travellers were to handle it alone through Internet. Hence, due to the importance of their existing role, they are very pessimistic that travel agencies will become a pure-play company in the future.

Nevertheless, using the Internet is to enhance the flexibility and convenience of their business activities and to provide good customer service. The Internet is seen to assist them reaching a large number of potential new customers as well as to promote their products domestically and internationally.

CONCLUSION

The emergence of Internet should not be pointed out as a factor that shall jeopardize the existing role of the intermediaries. Indeed, Internet technology is a contributing factor in levelling the best practices of the travel agencies to improve their services toward customers. The "disintermediation" syndrome introduced in IDR model is not viable in this study due to the fact that the technology is continuously used by the agencies as strategic tools in

enhancing their businesses. The potential threat of lacking personal human contact should not be the main concern for not using the technology as majority of the travel agencies believe that Internet provides them opportunities as intermediary in reaching out their global target market.

REFERENCES

Bailey, J.P. and Bakos, Y. (1997). An Exploratory Study of the Emerging Role of Electronic Intermediaries. *International Journal of Electronic Commerce*, 1(3), pp 7-20.

Bakos, Y. (1998). The Emerging Role of Electronic Marketplaces on the Internet. *Communication of the ACM*.

Bloch, M. and Segev, A. (1997). The Impact of Electronic Commerce on the Travel Industry: An Analysis Methodology and Case Study. *The Fisher Center for Information Technology and Management*.

Buhalis, D. and Licata, M.C. (2001). The Future eTourism Intermediaries. *Tourism Management*, 23, pp 207-220.

Chircu, A.M. and Kauffman, R.J. (1999). Analyzing Firm-Level Strategy for Internet-Focused Reintermediation. *Proceedings of the 32nd Hawaii International Conference on System Science*.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989). User Accpetance of Computer Technology: A comparison of Two Theoretical Models. *Management Science*, 35 (8), 982-1002.

Gates, W. (1995). *The Road Ahead*. Penguin Books, New York, NY.

Gellman, R. (1996). Disintermediation and the Internet. Government Information Quarterly, 13(1), pp 1-8.

Lawrence, E., B. Corbitt, et al. (2000). *Internet commerce: digital models for business*. Milton,Qld, John Wiley & Sons Australia, Ltd

Malone, T.W., Yates, J. and Benjamin, R.I. (1987). Electronic Markets and Electronic Hierarchies. *Communication of the ACM*, 30(6), pp 484-498.

Raja Mazhatul Yasmin Suraya. (2003). Internet Diffusion and E-Business Opportunities Amongst Malaysian Travel Agencies. *Proceedings of the 3rd International Conference on Information Technology in Asia: Transforming Knowledge into Insight CITA 03*.

Stamboulis, Y. and Skayannis, P. (2002). Innovation Strategies and Technology for Experience-based Tourism. *Tourism Management*, 24, pp 35-43.

Turban, E., J. Lee, et al. (2000). *Electronic Commerce: a managerial perspective*. New Jersey, Prentice-Hall International, Inc.

Customers' Purchasing Concerns in E-Retailing Industry

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ABSTRACT

This is a concept paper to explore various concerns emphasized by consumers when they purchase products and services online. Besides, it will look into the dynamics of changing retail industry, the types of online consumers, and the products sale online. Eight factors have been identified by consumers as their major concerns for any online purchase decision, from a wide range of literature reviews. They are the security of online transactions, privacy, convenience and time saved, product choice, price, product variety, online store reputation, and the availability of customer services online. This paper serves as a good foundation for a further quantitative research on the e-retailing industry.

INTRODUCTION

In the not-too-distant future, rapid advances in technology, escalating global competition, and rising consumer expectations for quality, speed of response, and customization will require companies to substantially rethink their business models. One thing is clear; the future will be substantially different from the present. Society went through dramatic changes and upheavals as a result of the transition from the agricultural age to the industrial age; the transition to the information age was accompanied by even greater change. The transition is well underway, but still remains in its early stages. The emerging consensus about the future of today's various information industries is that they will converge because they are all increasingly based on digital electronic technology. The vision revolves around the presence of an interactive broadband digital 'highway" terminating in very high-resolution multimedia display terminals in consumers' homes and workplaces. Today Internet represents a crude approximation of the capabilities and functionality that are expected to be widely deployed. It serves as a very large test bed for companies and as a "training platform" for consumers to learn new modalities of interaction and consumption. From the perspective of consumers, the primary impact of the deployment of such an infrastructure will be to ease the severe time and place constraints that are currently placed on them. "Anytime, anywhere" consumption will become commonplace.

PAST AND FUTURE MODES OF MARKETING

Figure 1:

Source: Sheth & Sisodia (1997)

Commerce today, for the most part, tend to be time and location bound. That is, transactions are constrained to occur at particular times and/or at particular locations. We are then, in the midst of a sea-change from gravitational commerce, to an era of digital commerce, which will be almost entirely free of those constraints. The future will see "anytime, anywhere procurement" coupled with "anytime, anywhere consumption".

CHANGING RETAIL INDUSTRY DYNAMICS

Retailing is expected to change with the rapid development of new online sales and distribution channels that literally can be used from anywhere and anytime. Almost every retailer is reevaluating every aspect of its operation from customer service to advertising, merchandising to store design, and logistics to order fulfillment. Online channels such as online services and the Web are impacting traditional retail business model. In the traditional model, the customer went to the store and located the product. In the online model, the retailer seeks out the customer. The success of catalog retailers demonstrates that a significant portion of consumers has embraced the reverse model: the retailer going to the consumer.

Before examining the implications of changing consumer behavior and online retailing in the existing retail business, let us step back for a moment and ask the question: Why should retailers consider the online environment as a way of doing business? The answer lies in understanding the market changes that affect retailing and that will continue to affect it in the future.

E-RETAILING

E-retailing means "a business enterprise with the capability to exchange value (money, goods, services and information) electronically" (Anderson Consulting, 1999). According to Janal (2000), several advantages of e-retailing to consumers are:

- Comparison shopping is quick and easy
- Consumers can order directly from the comfort of their home or office, 24 hours a day, from anywhere in the world.
- The stores never closes
- There are no traffic jams, no parking hassle, and no waste of time

On the other hand, online retailers also gain benefits such as:

- *Global Opportunities*: the Internet access delivers a company with an opportunity to implement highly cost-effective vehicles for positioning themselves globally. It is especially beneficial to smaller companies who want to expand their business globally, but do not have the capital and resources to do so. In addition, the Internet help ease the red tape surrounding the prospect of doing business overseas, thus avoiding regulations and restrictions that companies must follow who are physically present in other countries and who advertise in international journals (Paul, 1996).

- *Accessibility*: Company who use the Internet, increase their hours of business on a global spectrum. Instead of a typical eight-hour day, businesses have increased their opportunities by providing 24-hour access, which is important in conducting business across different time zones or internationally. Expanding access indeed increases the number and coverage of potential customers (Paul, 1996).

- *Utility*: Appropriate form, place and time utility by the Internet (i.e. giving customers the opportunity to decide what they want, where and when) result in a competitive advantage for the marketers. The Internet furnishes product and service information to current and potential customers when they want it, and hence increasing the changes of trial, purchase or repurchase (Paul, 1996).

- *Direct Communication*: As an interactive channel for direct communication and data exchange, the Internet enables focused targeting and segmentation opportunities for retailers who can more closely monitor consumer behavior (Doherty et al., 1999).

- *Cost Savings*: E-business benefits the retailers by substantial cost savings on the store, salespeople and possibly some warehousing cost. Besides, information can be rapidly changed and updated easily without any added cost, if compare to conventional catalogues which involve lots of printing and mailing cost (Doherty et al., 1999).

TYPES OF CONSUMERS

In general, consumers can be categorized into three types:

- Impulsive buyers, who purchase products quickly.
- Patient buyers, who purchase products after making comparison.
- Analytical buyers, who do substantial research before making the decision to purchase products or services.

An understanding of the consumer type allows us to delve deeper into what motivates various type of shopping. Consumer behavior, which has a profound impact on the way online systems are developed, can be viewed in terms of two questions: Why consumers do shopping and what are they looking for? As these questions imply, an online shopping experience can be valuable (accomplish something) or valueless (simply browsing). Marketing researchers over the years have categorized shopping experience into two dimensions: utilitarian and hedonic. Utilitarian means carrying out a shopping activity to achieve a goal or complete a task, while hedonic means carrying out a shopping activity because it is fun. An understanding of utilitarian and hedonic shopping can provide inside into many electronic commerce consumption behaviors that are normally not taken into account in the design and layout of electronic marketplace.

THE ONLINE CONSUMERS

Consumer demand for the Internet is a key factor that may ultimately drive widespread adoption of the Internet by retailers. Whether the consumer has access and how he or she uses or perceives Internet shopping will affect its ultimate success. Internet retailing offers a retail experience that is totally different from that of fixed-location retailing (Westland & Au, 1998). Comparison and price shopping across a greater number of sites will be easier and could be achieved within minutes. Indeed, it is common in the early part of the buying decision-making process, than for them to buy direct on the Web. They will then subsequently purchase the product through the fixed-location store or order by telephone or fax.

From a retailing perspective the use of the Internet is an elective whereby consumers require effort to access retail Web sites and select products. As a consequence carefully planned shopping online may dominate, rather than impulse shopping. Thus, Web sites that are not well designed, and which require the potential customer to browse through many screens before locating his or her chosen products, could easily deter customers from ever returning to the site. Furthermore, the medium's inability to allow consumers to touch merchandise may be problematic, as the majority of consumers prefer the social and physical interaction of 'going to the shops' (KPMG & OXIRM, 1996). The Internet also places more demands on end-users, requiring them to understand the complexity of Web site design. Additionally, the difficulties encountered in locating Web sites, searching and sorting through the Internet may also deter some consumer segments from switching to cybershopping.

According to Hoffman, Kalsbeek, and Novak (1996), those who actually but on the Web use the Internet at least once a week and are frequent Web users. On part of the gender, women are a minority on the Web, consisting of only 20 to 30 percent of the user base. However, there is a steadily growth on the Internet usage among women. A global e-commerce report by Taylor Nelson Sofres (2001) reported that 42% of Internet users and 45% of online shoppers are women. The result is aligned with a report in New Straits Times (July 4, 2001) which coded women is becoming more efficient in their Web behavior than men and are showing an increasing willingness to purchase online. Women spend less time online as they generally know what they're looking for and leave once they achieve their goal. Asian women spent an average of 12 hours online compared with 14.5 hours for men. On average, the number of women surfers across the Asia-Pacific region has been increased by 36% since January 2001.

On the other hand, Quelch and Klein (1996) stated that consumers who shop online are mostly college white males in their early thirties, earning higher than average incomes and employed in the computer, education, and other professional fields. The result closely matched the demographic profile of online shoppers in global e-commerce report by Taylor Nelson Sofres (2001), which stated that majority of online shoppers are from the age range of 30-39 years old. Even tough those who are below 20 years old are the most who surf on Internet, but they are unlikely to shop due to the non-availability of credit cards, rather than any difference in attitude and willingness.

THE ONLINE PRODUCTS

The nature of the products and the related shopping activity will govern the product groups most likely to succeed on the Internet. Basically, the major product categories of shopping include those items that are standard and require little information. Consumers purchase products ranging from food, apparel, magazine subscriptions, books, CD's, medicine to furniture, and electronics.

According to Chaffet et al. (2000), intangible products and services such as flight reservations and banking services are well suited to online trading as they are less restricted by operational logistics than tangible goods. Nevertheless, evidence from the US experience of Internet retailing indicates a preference for electronic products. Among the goods sold by the top 100 US Internet retailers, electronic products have a greater representation than other product categories. Meanwhile, banking services, books and magazines accounted for 47 percent of Internet sales in the USA. At the other extreme, clothing retailers have a comparatively low representation. This seems to suggest that that the most popular goods are those do not need to be touched or see prior to purchase (Pavitt, 1997). However, it is ambiguous to know that clothes stood as the third popular product category that was being purchase online globally in Taylor Nelson Sofres (2001) global e-commerce report, while books and music stood as the first and second accordingly. The popularity of Books and Music may due to both categories are relatively reasonably priced (low risk for the purchaser) and the homogeneity of the products (i.e. a CD is the same wherever we buy it). Then the delivery of these items is also simple and safe. Meanwhile, another research by Karakaya and Charlton (2001) showed travel related services are on the top of the list of the products/services purchased online. The travel related Web sites offer sales of airline tickets, hotel reservations, automobile rental sales and reservations.

MAJOR CONCERNS FOR CONSUMERS TO DO ONLINE SHOPPING

It is acknowledged that consumer purchases via the Internet are increasing over time, however, as suggested by Hoffman and Novak (1996), computer-mediated environments such as the World Wide Web (WWW) are not well understood, and present some unique challenges to commercial enterprise. Consumers will consider several factors when deciding whether and when to adopt the Internet as a method of purchasing for household use. As a result, it is foremost important for e-business marketers to take care of these factors which will influent consumers' purchasing decision on the Internet.

Security of Transactions

Internal network protection will be a big issue for the companies that wish to offer their services to Internet-using customers around the world. Criminals or other hackers can infiltrate company files and infect them with a virus, which is then sent to other computers to infect them. If the networks are not secure such people could also find important information about the company. It is learned that computer break-ins are not new. New security holes in the Internet are uncovered almost weekly and help to alert prospective companies and customers. As long as technology companies, software makers, banks and major credit card companies have not developed a common protocol to make financial transactions over the Internet safe, many unsolved issues still exist. The Internet needs to have a level of safety that businesses and consumers can live with.

In order to protect company data from intruders breaking into a system, companies use "firewall" computer software to protect a network from outside bad influences. Only non-destructive messages or files can pass through such a firewall, although it is fairly difficult to recognize all the "bad" files coming from the outside. There are different kinds of firewall software packages exist on the market today. Application-level security looks inside a packet and reads the data to make sure they are safe. Packet filters make sure that the package itself is satisfactory. For instance, cryptographic software can scramble the information from the sender to the receiver and a specific key is required to decrypt it. In the process of buying online, when customer types in his/her credit card number, it would be encrypted immediately. The merchant of the purchased item then passes the encrypted number to bank, which has to decrypt the number itself. The bank would then authorize the merchant to proceed with the transaction (Forcht, 1996).

Even tough firewall software could prevent unauthorized Internet traffic from entering and it is possible to make the Internet secure; however, firewall alone might not be sufficient to keep intruders out and a company should concentrate on other security aspects, too. User authentication systems are strongly recommended to allow only authenticated users to have access to a system. The development of secure ID smart cards might be a first step in the right direction to identify the user of a specific service. These cards are embedded with microchips and generate unique passwords that confirm a person's identity. Each password gets used only once and it is extremely difficult to find out such computer-created passwords. For instance, American Express used to have a

payment program called "Private Payments." This service allows cardholders to apply for a single-use credit card number; after a consumer makes a purchase, the umber is invalidated automatically (Karakaya & Charlton, 2001).

Besides, electronic cash as discussed by Rowley (1996) also played an important role in safe Internet purchasing transaction. E-cash provides another interesting option for low-cost items such as magazine. The GUI (Graphical User Icons) interface allows the dragging and dropping of icons representing stacks of coins, receipts, record books, etc. To shop on the Internet with e-cash, consumers first draw digital coins from Internet bank and then store them on hard disk. Consumers will use the coins when the vendor's software prompts for payment. Some believe that the arrival of e-cash will have a significant impact on market activity. However, for e-cash to be successful, there need to be some clear ground rules about the standards associated with the implementation of e-cash; a universal protocol for electronic money is necessary.

According to Forcht (1996), the company information security is based on three foundations:

1. *Data integrity*: A company must be sure that its data have not been changed.
2. *Confidentiality of data*: Companies have to be able to keep to themselves what customer and themselves do not want others to know, such as customer database, credit card numbers, etc.
3. *Authenticity*: Companies need to be sure that messages they receive from the Internet are from the people they claim to be.

If one of the previous mentioned factors could be worked around by the hackers, then the company is no longer secure and this can scare away the potential online shoppers.

Nevertheless, Jarvenpaa and Todd (1997) found out when people are not prompted for issues related to security, they do not think of those risks as often as issues of product value, customer service, and shopping experience (a result from the open-ended questionnaire). However, when prompted to think of the credit card concern, most participants acknowledged that it is an issue for them (a result from the structured questionnaire). Other research reinforces the finding that security issues are not stopping people from browsing and buying on-line. This was echoed by Hagel et al. (1996) who suggested that "while consumes are keen on security issues, they are willing to trade it for some kind of economic benefit". These results also consistent with a report in the New Strait Times (May 13, 1996) on the Malaysian shopping survey by Jaring Enterprise, which reported that a lack of interesting products to buy online was a common impediment to shopping than security concerns. Meanwhile, Jarvenpaa and Todd (1997) pilot study result showed that during browsing, some respondents found it annoying that they were constantly reminded that the site was secure. However, for the participants who had never shopped on the Internet, they were comforted by the message that the site was secure.

Privacy

Many Web sites ask visitors to provide information for a variety of reasons. For example, Expedia.com asks travelers to create their own profiles so that the consumers can save time in their next visit. Similarly, other online firms request data from consumers to use in their marketing activities. Sometimes, the information requested is merely names, addresses, and e-mail addresses. However, sometimes, consumers are asked to fill out lengthy marketing research surveys. The data collectors, promise consumers that they will keep the information confidential but they do not always keep their promises. Therefore, consumers are weary on providing information. In fact many consumers leave the sites without providing the requested data. (Karakaya & Charlton, 2001).

During the last decade, the Internet use by consumers has helped increase the identity theft, or using the identifying information of another person – name, social security number, mother's maiden name, or other personal data – to commit fraud or engage in other unlawful activity. As a result, it is foremost important that firms request data from consumers need to make supplying information optional and allow users to change and delete the information provided. In addition, they need to assure consumers that they will not share the information provided by consumers with other firms. A Privacy Policy statement on the Web sites will also make consumers feel more comfortable about giving information online. (Karakaya & Charlton, 2001).

According to Prabhaker (2000), every time an individual interacts with the Web, she leaves behind a rail of extraordinary detailed information about who she is, her buying habits, financial status, may be her medical records and other intimate personal details. She has very little control over who can have access to this information and what they do with it. It is unrealistic to expect profit driven businesses not to infringe on consumer privacy in an environment that makes it increasingly profitable and a technology that makes it easier than ever to collect and share personal information. A study by Tweney (1998) showed that privacy is online

consumers' biggest concern. 79 percent of online shoppers are concerned about threats to their personal privacy and 9 percent said they had fallen victim to online privacy invasion.

The fundamental problem in Internet privacy is not the disclosure of the sensitive information by itself. People will not object to companies gathering and analyzing data about their customers with the intent of serving their customers better. As long as the customers give that information voluntarily and are made fully aware as to how it is going to be used, their privacy is not being violated. The concern is, when that information is merged with several other databases owned by companies other than the one they are doing business with, then the consumer totally loses control over how that information is being used. According to Kakalik & Wright (1996), the typical consumer is on more than 100 mailing lists and at least 50 databases – the variety of information collected via cookies. For instance, it can be gainfully utilized or can be misused by bombarding people with advertising.

Convenience and Time Saved

From the Jarvenpaa and Todd (1997) open-ended questionnaire study, results showed that convenience was indeed the most salient shopping factor for their sample and the most frequent reason consumers would shop on the Internet. Shoppers emphasized the reduced physical effort, time saved, and greater convenience that the Internet could afford. However, there was complaint that it still took too many steps to find a specific item on the Internet. Hence, although virtually everyone noted the convenience of Internet shopping, they also believed it was not effortless enough. Some found the Web hard to navigate, while some were disappointed that they were not able to easily compare prices across retailers.

A good example of online grocer who has built their online business around convenience is Peapod. In general, groceries purchased through Peapod are no less expensive than groceries purchased at a local supermarket. With shipping cost thrown in, the groceries are often marginally more expensive. Peapod's target customer is the busy executive who does not have the time to shop. Groceries are delivered by courier to the customer's front door, seven days a week, at the time specified. Peapod's customers are willing to pay a little more for greater convenience. (Huff, Wade, Parent, Schneberger & Newson, 2000)

Home banking is another example of using a convenience strategy. Online banking facilities will can serve the dual purpose of reducing branch transaction costs and providing a more convenient interface through which consumers can do their banking activities such as bill payment, stock trading, money transfer etc from home. (Huff et al., 2000)

Product Choice

Offering a choice of products online that no offline merchant can possibly match is another determining factor in online purchasing. Megadepot.com, an online supply store, offers a massive selection of office supplies, software, and hardware and delivers for free anywhere in North America. Amazon.com offers more than three million books for sale, while the average conventional bookstore can stock only about 250,000 copies of books.

Price

Benjamin and Wigand (1995) study suggested that online consumer access to a broad selection of lower-priced goods was a determining factor in online purchasing. However, this is contradicted to Huff et al. (1997) study which coded products online are slightly higher than prices offline, primarily due to transportation costs and complicated local sales taxes and import duties. For instance, despite Amazon.com's 10-25 percent discount off cover prices, the price of a book shipped to the door is often slightly more than it would cost at a local bookstore.

Meanwhile, Jarvenpaa & Todd (1997) study suggested that price seemed to be the most important product value related determinant of consumers' attitude toward Internet shopping and their intention to shop in the future. Consumers would expect to see a broad array of goods competitively priced, according to Fram & Grady (1995). No "fun" technology will eliminate this need for functional benefits to the consumers.

Product Variety

In Jarvenpaa & Todd (1997) study, participants were deeply disappointed with the lack of product variety at any particular site. About a third of the shoppers expressed disappointment with the small number of products typically found among a particular merchant's offerings and limited information available about the products.

Result from the study reinforced that product variety could contribute to positive attitudes toward online shopping.

Online Store Reputation

Quelch and Klein (1996) depicted the Internet as particularly revolutionary for small and start-up firms because small companies will be able to compete more easily in the global market-space. So do consumers care who they are buying from? Jarvenpaa & Todd (1997) study's result suggested that reliability and overall reputation is very important to consumers shopping on the Web. Consumers were skeptical of stores they had never heard of, particularly those perceived to be operated by individuals. They also inquired about who regulates and monitors Web stores and whether a better business bureau existed. Thus, online store reputation is considered another factor to influent consumers' intention to shop.

Availability of Customer Service

Customer service is another major factor in online purchasing. Many industry analysts and e-commerce firms indicate that from 50 to 70% of customers abandon their shopping carts without making any purchase. The attribute reason may range from poor to no customer service. According to a recent marketing research firm, Datamonitor, 7.8% of abandoned online shopping carts in United States could be salvaged through an effective customer service. The 7.8% lost sales amounts to $6.1 billion in sales. The Datamonitor predicts that the sales lost to poor service could reach $10.9 billion this year. Most online firms have customer service and key word or product search areas (search engines) on their Web sites where customers can make inquiries. Many also have frequently asked questions sections that customers find answers to most common problems. While the frequently asked questions section on Web-sites work fine, the automated responses including automated e-mails often result in providing inaccurate information or general information that are not so useful to customers.

Companies need to develop Web sites with customer service in mind. Good Web sites have customer service centers including frequency asked questions, option of sending e-mail to customer service representatives, detailed information about products, dialog boxes where customer can submit complaints or questions. Interestingly, some online firms think they are virtual and do not provide contact information except an e-mail address. This kind of practice causes suspicion and should be avoided. Many customers still like to phone companies to voice their complaints or discuss problems. Including eight hundred numbers and names of individuals to contact is certainly a plus today (Karakaya and Charlton, 2001).

At the same time, Huff et al. (2000) shared the same view. They mentioned that the keys to customer service in the world of Internet business are responsiveness and "high touch". If everything else works perfectly, the need for customer service, in principle, should be minimal. One common scenario where fast response is necessary involves entering a credit card number. First-time online shoppers often want extra assurances that they won't lose their life saving when they click the "purchase" button. Having a clearly displayed 1-800 number they can call for reassurance, right at that point on the screen, can go a long way toward calming such fears. But if consumers do call and are made to wait for a long time, that may be worse than no number at all.

There are millions of sites on the Internet each competing for cyber loyalty and many companies are working hard to produce "sticky" sites. Stickiness is measured by the number of minutes visitors stay at a site and the frequency with which they return (Crockett, 2000). To do this they must add value to the consumer's experience. Internet services have to be tailored to meet customers' needs. Satisfying the customer is no longer sufficient. Firms have to meet customers' expectations of having an enjoyable experience when they deal with a particular organization. If not, customers will go elsewhere to a competitor who is only a click of the mouse away (Muir & Douglas, 2001). Meanwhile, Karakaya & Charlton (2001) mentioned about the good product delivery and returns policy can boom the product sale online.

According to Bitran & Lojo (1993), the quality of service depends not only on offering products that meet customers' needs and delivering them efficiently, but also on creating an atmosphere and overall experience that is satisfying. Hoffman and Novak (1996) argued that the Internet storefronts provide greater consumer control and are more accessible, flexible, and se-stimulating than traditional retail stores.

In Jarvenpaa & Todd (1997) study, participants were dismayed by the difficulties in trying to do goal-directed shopping and locate specific products or specific merchants. They were also frustrated by numerous broke or inactive links. They thought the store directories were misleading, making them expect one thing but providing another. The participants frequently got lost in the aisles of the malls. A common feeling was, "I would already be on my way if I were in a real mall." Then, even the participants who stumbled across items that were novel

and interesting, much the same way that that they do when window shopping, found that many sites provided limited support for the buying process. Online merchants had not considered the needs of consumers for information about policies related to returns, shipping charges, product guarantees, and the like. In some instances, to place an order the customer was expected to remember product codes, calculate taxes, and add in shipping costs – all of the things that participants believed computers should do for them. The result suggested that participants found customer service to be largely nonexistent on the Web. In summary, Jarvenpaa & Todd (1997) study indicated that customer service did influence participants' intention to shop online. Thus, the lack of information on company policies with respect to pricing, returns, delivery times, and guarantees did temper participants' enthusiasm for completing a commercial transaction on the Web.

CONCLUSION

Doing business on the Internet will become even more important in the future. More companies will have access to the Internet and, with a reduction in communication prices, more customers will come to the Internet as well. The Internet offers tremendous possibilities and could, in the long run, outperform conventional distribution channels. It is very easy to get connected to the Internet and people can surf and shop the Internet 24 hours a day, if they want to. The Internet offers an excellent way to get in touch with the customers on a one-to-one basis. According to Forcht (1996), better technologies will help companies to represent themselves better and sell more products. Muir & Douglas (2001) further add that IT skills alone may not be sufficient to cope in such a dynamic environment. Management and general business skills may also be required. Despite some barriers, individual and household consumers are making more and more use of the Internet when purchasing services and products. A key question raised is whether the e-retailers have the appropriate skills in place to deal with such transformations in the marketplace and do they concern about the determining factors that influent consumers online purchasing behaviors, from the consumers' point of view.

BIBLIOGRAPHIES

Aaron, K. (1997). "Time crunch". *Credit Union Management*. 20(5): 48-50.
Ainscough, T. & Luckett, M. G. (1996). "The Internet for the rest of us: marketing on the World Wide Web". *The Journal of Consumer Marketing*. 13(2): 45-52.
Shukor Rahman (June 18, 2001). "Trust factor in e-trading". *News Straits Times: Computimes*.
Abdul Rahim Abu Bakar, Zolkafli Hussin, Fariza Hashim & Salniza Md Salleh (2000). "E-commerce adoption among companies in Malaysia". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.
Ahmad Kushairi (August 27, 2001). "Going e-commerce way". *News Straits Times: Computimes*. P24.
Aimie Pardas (August 27, 2001). "Prospects of venture capital funding for e-commerce". *News Straits Times: Computimes*. P28.
Ainscough, T. L. (1996). "The Internet for the rest of us: marketing on the World Wide Web". *Journal of Consumer Marketing*. 13(2): 36-47.
Alba, Joseph; Lynch, John; Weitz, Barton; Janiszewski, Chris; Lutz, Richard; Sawyer, Alan & Wood, Stacy (1997). "Interactive home shopping: consumer, retailer, and manufacturer incentives to participate in electronic marketplaces". *Journal of Marketing*. 61: 38-53.
Aldridge, A., Forcht, K. & Pierson, J. (1997). "Get linked or get lost: marketing strategy for the Internet". *Internet Research*. 7(3): 161-169.
Aldridge, A., White, M. & Forcht, K. (1997). "Security considerations of doing business via the Internet: cautions to be considered". *Internet Research*. 7(1): 9-15.
Allen, Eric & Fjermestad, Jerry (2001). "E-commerce marketing strategies: an integrated framework and case analysis". *Logistics Information Management*. 14(1/2): 14-23.
Alsop, S. (1999). "You can trust me on this really". *Fortune*. 139(5): 175-176.
Anderson Consulting (1999). "E-commerce: what's all the fuss". *Presentation*. 5(1).
Andrews, Kelly J. (1999). "The World Wide Web lives up to its name". *Target Marketing*.
Assael, Henry (1995). *Consumer Behavior and Marketing Action*. International Thomson Publishing.
Assael, Henry (1987). *Consumer Behavior and Marketing Action* (3rd edition).
Bajaj, Kamlesh K. & Nag, Debjani (2000). *E-commerce: the Cutting Edge of Business (International edition)*. McGraw-Hill Companies, Inc.
Bellman, S., Lohse, G. L. & Johnson, E. J. (1999). "Predictors of online buying behavior". *Communications of the ACM*. 42(12): 32-38.
Belsie, Laurent (1997). "New evidence suggests Internet shopping is a safe option". *Christian Science Monitor*. 89(126): 4.
Belsie, Lauren (1995). "Retailers flocked to Internet, but where were shoppers?" *Christian Science Monitor*. 88(24): 8.

Benjamin, Robert & Wigand, Rolf (1995). "Electronic markets and virtual value chains on the information superhighway". *Sloan Management Review*. 36: 62-72.

Bennett, Roger (1997). "Export marketing and the Internet". *International Marketing Review*. 14(5): 324-344.

Bitran, Gabriel & Lojo, Maureen (1993). "A framework for analyzing the quality of the customer interface". *European Management Journal*. 11: 385-396.

Bontis, Nick & Castro, Akemi D. (2000). "The First World Congress on the management of electronic commerce: review and commentary". *Internet Research: Electronic Networking Applications and Policy*. 10(5): 365-374.

Boston Consulting Group (1999). "The state of online retailing 2.0 summary of key findings". http://www.shop.org/research/summary.htm.

Bradley, Peter; Gooley, Toby & Cooke, James A. (2000) ."Clicks VS mortar: e-tail shipping strategies diverge". *Logistics Management and Distribution Report*. 39(7): 24-25.

Bradley, Walter A. & Jodie, Kregg S. (1997). *Electronic Sales Force Management at Mary Kay*. Sage Publications, Inc.

Bredenberg, A. (1995). "Seven myths of Internet marketing" . *Zip/Target Marketing*. 18(9): 49-50.

Brewer, E. (1995). "Internet flaws a setback for commerce". *New York Times: Personal Technology*. P7.

Buck, P. S. (1996). "Electronic commerce – would, could and should you use current Internet payment mechanisms?" . *Internet Research*. 6(2): 5-18.

Burke, R. R. (1997). "Do you see what I see? The future of virtual shopping". *Journal of the Academy of Marketing Science*. 25: 352-360.

Burke, Rayment R. (1997). *Real Shopping in a Virtual Store*. Sage Publications, Inc.

Bush, M. (2000) . "Study predicts Internet booking is heading". *Hotel and Motel Management*. 215(15): 17-18.

Cannon, H. M. & Morgan, F. W. (1990). "A strategic pricing framework". *Journal of services marketing*. 4: 19-30.

Carn, Neil G., Rabianski, Joseph S. & Vernor, James D. (1995). "Structural Trends Impacting Retail Businesses". *Economic Development Review*. Spring Issue.

Chaffey, Dave; Mayer, Richard; Johnson, Kevin & Ellis-Chadwick, Fiona (2000). *Internet Marketing. Financial Times*, Prentice Hall.

Chee Yih Yang (April 17, 2001) ."Beefing up content to drive K-economy". *The Star*: Intech. P5.

Cohen, Warren (1997). "Online malls move closer to home". *U. S. News & World Report*. 123(21): 86.

Collin, Simon (1997). *Doing Business on the Internet*. Kogan Page Limited.

Comer, Douglas E. (1997). *The Internet (International edition)*. Prentice Hall, Inc.

Corbitt, Bryn & Thanasankit, Theerasak (2000). "Hegemonies of e-commerce policy perspectives – a comparative analysis". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Cox, J. & Dale, B. G. (2001). "Service quality and e-commerce: an exploratory analysis". *Managing Service Quality*. 11(2).

Coyle, Stephen M. (2000). "E-retailing update – shopping in the 21st century". *Real Estate Finance*. 17(2): 21-30.

Crockett, R. O. (May 15, 2000). "Keep 'em coming back". *Business Week*: e-biz. P20.

Daniel, E. & Storey, C. (1997). "Online Banking: strategic and management challenges". *Long Range Planning*. 30(6): 890-898.

Daniel, Maria O. (June 21, 2001). "State of the local dotcom industry". *News Straits Times: Computimes*. P 27.

Darden, W. R. & Dorsh, M. J. (1990). "An action strategy approach to examining shopping behaviors". *Journal of Business Research*. 21: 289-308.

Davidson, W. H. (1997). "Changing channels". *Industry Week*. 246(21): 20-22.

Degeratu, Alexandru M., Rangaswamy, Arvind & Jianan, Wu (2000). "Consumer choice behavior in online and traditional supermarkets: the effects of brand name, price, and other search attributes". *International Journal of Research in Marketing*. 17: 55-78.

Deighton, J. (1997). "Commentary on exploring the implications of the Internet for consumer marketing". *Journal of the Academy of Marketing Science*. 25: 347-351.

Devlin, J. F. (1995). " Technology and innovation in retail banking distribution". *International Journal of Bank Marketing*. 13(4).

Doherty, N. F.; Ellis-Chadwick, F. & Hart, C. A. (1999). "Cyber retailing in the UK: the potential of the Internet as a retail channel". *International Journal of Retail & Distribution Management*. 27(1): 22-36.

Donthu, N. & Gracia, A. (1999). "The Internet shopper". *Journal of Advertising Research*. 39(3): 52-58.

Dorgan, T. (1997). "Belief in the future". *Progressive Grocer*. 76(2): 67-68.

Duan, Mary (1997) ."The Internet security". *Baltimore Business Journal*. 15(22): 19-20.

Duboff, Charlie & Jim, Spaeth (2000). "Researching the future Internet". **Direct Marketing**. 63(3): 42-54.

Eager, Bill & McCall, Cathy (1999). *Online Marketing*. Que, Inc.

Eastlick, Mary A. & Lotz, Sherry (1999). "Profiling potential adopters and non-adopters of an interactive electronic shopping medium". *International Journal of Retail & Distribution Managemen*t. 27(6): 209-223.

Egan, J. & Pollack, K. (1995). "Gold rush in cyberspace". *US News & World Report*. P72-83.

Fanella, J., Saide, F. & Zimmerman, D. (1997). "Planting seeds for new customers on the Internet". *CPCU Journal*. 50(3): 59-69.

Fatimah Mohd Arshad (2000). "Prioritising research agenda for e-commerce in Malaysia". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Feher, A. & Towell, E. (1997). "Business use of the Internet". *Internet research*. 7(3): 195-200.

Finch, B. J. (1997). "A new way to listen to the customer". *Quarterly Progress.* 30(5): 73-76.

Flether, Charlie (2000). "ID thievery is on the rise". *Catalog Age*. 17(7): 57.

Fogarty, Kevin (2000). "E-retailing still stinks". *Computerworld*. 34(41): 46-47.

Fojt, M. (1996). "Doing business on the information superhighway". *Internet Research*. 6(2): 79-81.

Forcht, Karen A. (1996). "Doing business on the Internet: marketing and security aspects". *Information Management & Computer Security*. 4(4).

Forrester Research (1999). "Online retail to reach $184 billion by 2004 as post-web retail era unfolds.". http://www.forrester.com/ER/Press/Release/html.

Frain, E. H. & Grady, D. B. (1997). "Internet shoppers: is there a surfer gender gap?". *Direct Marketing*. 59(9): 46-51.

Frain, E. H. & Grady, D. B. (1995). "Internet buyers: will the surfers become buyers?". *Direct Marketing*. 58: 63-85.

Furnell, S. M. & Karweni, T. (1999). "Security implications of electronic commerce: a survey of consumers and businesses". *Internet Research: Electronic Networking Applications and Policy*. 9(5): 372-382.

Gentry, Connie R. (2001). "When worlds collaborate". *Chain Store Age*. 77(4): 101-106.

Goldsborough, Reid (2001). "Internet shopping – cashless". *Consumers' Research Magazine*. 84(3): 31.

Goldsborough, Reid (2000). "Buyer beware – but be brave – when shopping online". *Community College Week*. 13(3): 11.

Goldsborough, Reid (1998). "Safe Internet shopping". *Consumers' Research Magazine*. 81(6): 33.

Gooding, D. (1995). "Shop till your fingers drop: online malls". *Communication Week*. 537(45).

Gordon, Mary E. & Lima-Turner, Kathryn D. (1997). "Consumer attitudes towards Internet advertising". *International Marketing Review*. 14(5): 362-375.

Gupta, Sunil & Chatterjee, Rabikar (1997). *Consumer and Corporate Adoption of the World Wide Web as a Commercial Medium*. Sage Publications, Inc.

Hagel, John III; Bergsma, Ennius E. & Dheer, Sanjeev (1996). "Placing your bets on electronic networks". *McKinsey Quarterly*. 2: 56-67.

Hair, Joseph F. & Keep, William W. (1997). *Electronic Marketing: Future Possibilities*. Sage Publications, Inc.

Hagel, John & Armstrong, Arthur G. (1997). *Net Gain – Expanding Markets through Virtual Communities*. McKinsey & Company, Inc.

Hamel, Gary & Sampler, Jeff (1998). "The e-corporation". *Fortune*. 138(11): 80-87.

Hamill, Jim (1997). "The Internet and international marketing". *International Marketing Review*. 14(5): 300-323.

Hancock, B. (1999). "Security views". *Computers and Security*. 18(3): 184-198.

Hanson, Ward (2000). *Internet Marketing*. South-Western College Publishing.

Hawaleshka, Danylo; DeMont, John & Atherley, Ruth (1999). "Clicking all the way". *Maclean's*. 112(50): 40-41.

Hawkins, D., Neal, C., Questor, P. & Best, R. (1996). *Consumer Behavior: Implications for Marketing Strategy* (1st Australian edition). McGraw Hill, Inc.

Haynes, Janice L., Lowe, Phyllis C. & Black, William C. (1994). "Rural and urban in-home clothing shoppers: a comparison". *Journal of Consumer Studies and Home Economics*. 18: 151-166.

Herbig, P. & Hale, B. (1997). "Internet: the marketing challenge of the twentieth century". *Internet Research*. 7(2): 95-100.

Hill, Kenneth (1997). *Electronic Marketing: The Dell Computer Experience*. Sage Publications, Inc.

Hoey, C. (1998). "Maximizing the effectiveness of web-based marketing communications". *Marketing Intelligence & Planning*. 16(1): 31-37.

Hoffman, D., Novak, T. & Chatterjee, D. (1995). "Commercial scenarios for the Web: opportunities and challenges". *Journal of Computer Mediated Communication*. 1(3): 23-30.

Hoffman, Donna L. & Novak, Thomas P. (1996). "Marketing in hypermedia computer-mediated environments: conceptual foundations". *Journal of Marketing*. 60: 50-68.

Hoffman, Donna L., Kalsbeek, William & Novak, Thomas P. (1996). "Internet and Web use in the United States: baselines for commercial development". Working paper of Vanderbilt University.

Holzinger, A. G. (1997). "The virtual future". *Nations Business*. 83(5): 44-47.

Huff, Sid L.; Wade, Michael; Parent, Michael; Schneberger, Scott & Newson, Peter (2000). *Cases in Electronic Commerce*. McGraw-Hill Companies, Inc.

Janal, S. Daniel (2000). *Marketing on the Internet*. John Wiley & Sons, Inc.

Jarvenpaa, S. L. & Todd, P. A. (1997). "Consumer reactions to electronic shopping on the World Wide Web". *International Journal of Electronic Commerce*. 1(2): 59-88.

Jarvenpaa, Sirkka L. & Todd, Peter A. (1997). *Is there a Future for Retailing on the Internet?*. Sage Publications, Inc.

Johnson-Page, Grace F. & Thatcher, Scott R. (2001). "B2C data privacy policies: current trends". *Management Decision.* 39(4).

Jones, T. O. & Sasser, W. E. (1995). "Why satisfied customers defect". *Harvard Business Review*. 73: 88-99.

Jones, Joseph M. & Vijayasarathy, Leo R. (1998). "Internet consumer catalog shopping: findings from an exploratory study and directions for future research". *Internet Research: Electronic Networking Applications and Policy.* 8(4): 322-330.

Jones, D. (1995). "Online surfing costs firms time and money". *USA Today*. P1-2.

Jucca, Lisa (July 17, 2001). "Europe leads drive for online privacy". *The Star: In-Tech*. P56.

Kakalik, J. & Wright, M. (1996). "Responding to privacy concerns of consumers". *Review of Business*. 18(1): 15-18.

Kalakota, Ravi & Whinston, Andrew B. (1997). *Electronic Commerce: A Manager's Guide*. Addison Wesley Longman, Inc.

Karakaya, Fahri & Charlton, Earl T. (2001). "Electronic commerce: current and future practices". *Managerial Finance*. 27(7): 42-53.

Kaynama, Shohreh A. & Balck, Christine I. (2000). "A proposal to assess the service quality of online travel agencies: an exploratory study". *Journal of Professional Services Marketing*. 21(1): 63-88.

Keeney, R. L. (1999). "The value of Internet commerce to the consumer". *Management Science*. 45(4): 533-542.

Khatibi, Ali & Thyagarajan, V. (2000). "E-commerce business opportunities for Telekom Malaysia". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Killey, D. (1997). "Jumping over the Net". *Brandweek*. 38(43): 30-33.

Klein, L. & Quelch, J. A. (1996) ."The Internet and international marketing". *Sloan Management Review*. 37(3): 60-75.

Kolesar, Mark B. & Galbraith, Wayne R. (2000). "A services-marketing perspective on e-retailing: implications for e-retailers and directions for further research". *Internet Research: Electronic Networking Applications and Policy.* 10(5).

Komenar, Margo (1997). *Electronic Marketing*. John Wiley & Sons, Inc.

Korgaonkar, Pradeep; Silverblatt, Ronnie & O' Leary, Bay (2001). "Web advertising and Hispanics". *Journal of Consumer Marketing.* 18(2).

Korzenowski, P. (1997). "E-commerce on the Net: a wealth of opportunity". *Computer Reseller News*. 766: 83-84.

Kotler, Philip & Armstrong, Gary (1999). *Principles of Marketing (8ᵗʰ edition).* Prentice-Hall International, Inc.

KPMG & OXIRM (1996). "The Internet: its potential and use by European retailers". *Oxford Institute of Retail Management Report*. No. 5114. London: KPMG.

Lee Ting Ting (June 20, 2001). "Pricing it right". *News Straits Times: Business Computimes*. P6.

Leibrock, Larry R. (1997). *Privacy, Surveillance, and Cookies*. Sage Publications, Inc.

Levis, P. (1995). "Security of personal data is lost in cyberspace". *Computer Information Systems*. P10.

Liaquat Hossain (2000). "Critical success factors for Internet banking: the cause of Bank of New Zealand". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Littlefield, James E., Bao, Yeqing & Cook, Don L. (2000). "Internet real estate information: are home purchasers paying attention to it?". *Journal of Consumer Marketing*. 17(7): 575-590.

Li Wei Mai & Ness, Mitchell (1998). "Perceived benefits of mail-order specialty foods". *British Food Journal*. 100(1): 10-17.

Lohse, G. L. & Spiller, P. (1998). "Electronic shopping". *Communication of the ACM*. 41(7): 81-87.

Lokken, Sheri; Hyllegard, Karen; Damhorst, Mary Lynn; Lyons, Nancy; Lakner, Hilda; Bastow-Shoop, Holly & Manikowske, Linda (2000). "Rural consumers' attitudes towards television and Internet for information search and product purchase". *Consumer Interests Annual*. (46): 215.

Lopez-Bassols, Vladimir & Vickery, Graham (2001). "E-commerce: the truth behind the web". *Organisation for Economic Cooperation and Development*. (224): 17-20.

L. Pin. Muhamad Jantan & Syed Nasirin (2000). "Factors influencing e-commerce adoption in service industry: a Malaysia Panorama". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Lusiana Adnin (June, 2001). "A few basic issues on security of e-commerce". *Jaring Internet Magazine*.

Mahajan, Vijay & Venkatesh, R. (2000). "Marketing modeling for e-business". *International Journal of Research in Marketing*. 17: 215-225.

Manecksha, Ferina (2001). "E-commerce models for Asian companies". *Global News Wire*.

Maruca, R. F. (1999). "Retailing: confronting the challenges that face bricks-and-mortar stores". *Harvard Business Review.* P159-168.

Mast, Elisabeth A., Shim, Soyeon & Morgan, George A. (1991). "In-home videotex shopping: potential adopters and non-adapters". *Journal of Consumer Studies and Home Economics*. 15: 133-146.

Mast, Elizabeth A., Oliver, Barbara A. & Shim, Soyeon (1991). "In-home electronic shopping: who uses it and why?". *Journal of Home Economics*.

McDonald, Malcolm & Wilson, Hugh (1999). E-*Marketing: Improving Marketing Effectiveness in a Digital World. Financial Times*, Prentice Hall.

McGovern, Michael. (1998). "Logistics on the Internet". *Transportation & Distribution*. 39(7): 68-72.

McLeod, J. (1995). "Let the buyer beware of Internet commerce". *Industry Week*. 244(9): 58.

McQuitty, Shaun & Peterson, Robin T. (2000). "Selling home entertainment on the Internet: an overview of a dynamic marketplace". *Journal of Consumer Marketing*. 17(3).

Miyazaki, A. D. & Fernandez, A. (2000). "Internet privacy and security: an examination of online retailer disclosures". *Journal of Public Policy and Marketing*. 19(1): 54-61.

Morganosky, M. A. & Cude, B. J. (2000). "Consumer response to online grocery shopping". *International Journal of Retail & Distribution Management*. 28(1): 17-26.

Morganosky, Michelle A. (1997). "Retailing and the Internet: a perspective on the top 100 US retailers". 25(11): 372-377.

Morris-Lee, J. (1996). "Privacy: it's everyone's business now". *Direct Marketing*. 58(12): 40-43.

Mottl, Judith N. (2000). "Brick 'n mortar VS dot-com". *Information Week*. (791): 61-72.

Muir, Lindsey & Douglas, Alex (2001). "Advent of e-business concepts in legal services and its impact on the quality of services". *Managing Service Quality*. 11(3).

Mustafa A. Ally (2000). "Towards a framework for the evaluation of Internet Based Payment Systems: identifying the principles, standards and business rules". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Nathan, R. (1998). "Internet research centre takes Intel inside China". *Natur*e. 393(14): 103.

National Retail Federation (1996) *The Electronic Retailing Market*. John Wiley & Sons, Inc.

Neo Mai & Ken Neo (June 28, 2001). "Buying and selling on the Internet". *News Straits Times: Computimes*. P53.

News Straits Times (July 19, 2001). "Challenging traditional distribution." P18.

News Straits Times (July 4, 2001) ."Women becoming better surfers." P20.

News Straits Times (May 13, 1996) ."Malaysian shopping survey."

Noack, David (2000). "Rapid delivery in cyberspace". *Link – Up*. 17(6): 25-28.

Notess, G. R. (1995). "Shopping, security and shareware". *Database*. 18(5): 85-88.

Nur Azman Abu, Nur Azlina Zahari & Ida Zuraida Zakaria (2000). "The security trenda of e-comerce". *International Conference on Electronic Commerce*. 21-23 Nov, Kuala Lumpur, Malaysia.

O'Brien, Larry & Harris, Frank (1991). *Retailing: Shopping Society Space*. David Fulton Publishers, London.

Olafson, Eric (2001). "Multi-channel retailing clicks". *Chain Store Age*. 77(1): 88-90.

Pak Yoong & Sid Huff (2000). "Current issues and concerns in e-commerce: an exploratory study of Small to medium sized enterprises in New Zealand". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Paul, Pallab (1996). "Marketing on the Internet". *Journal of Consumer Marketing*. 13(4)

Pavitt, Davidson (1997). "Retailing and the super highway: the future of the electronic home shopping industry". *International Journal of Retail & Distribution Management*. 25(1): 38-43.

Pearce, M. R. (1997). "Privacy: the retail consumer is watching". *Ivey Buusiness Quarterly*. 62(2): 69-71.

Peterson, Robert A. (1997). *Electronic Marketing: Visions, Definitions, and Implications*. Sage Publications, Inc.

Peterson, Robert A., Balasubramanian, Sridhar & Bronnenberg, Bart J. (1997). "Exploring the implications of the Internet for consumer marketing". *Journal of Marketing Science*. 25(4): 329-346.

Phipps, Rosemary & Simmons, Craig (1995). *Understanding Customers*. Butterworth-Heinemann Ltd.

Pitt, L. Berthon, P. & Watson, R. T. (1999). "Cyberservice: taming service marketing problems with the World Wide Web". *Business Horizons*. 42(1): 11-18.

Poon, Simpson & Swatman, Paula M. C. (1997). "Small business use of the Internet" .*International Marketing Review*. 14(5): 385-402.

Prabhaker, Paul R. (2000). "Who owns the online consumers?" .*Journal of Consumer Marketing*. 17(2): 158-171.

Prasanna Raman (July 12, 2001). "Ordering healthcare products online". *News Straits Times: Computimes*. P16.

Prasanna Raman (June 21, 2001). "Advantages of embracing e-commerce". *News Straits Times: Computime*s. P18.

Quelch, John A. & Klein, Lisa R. (1996). "The Internet and international marketing". *Sloan Management Review*. 37: 60-75.

Quint, Barbara (2001). "The rise and fall of virtual motivation". *Information Today.* 18(6): 10-12.

Rash, Wayne (1998). "There's just no incentive to shop on the Internet". *Internet Week*. (741): 94.

Reynolds, Jonathan (2000). "E-commerce: a critical review". *International Journal of Retail & Distribution Management*. 28(10): 417-444.

Richardson, Stanley & Yeap Peik Foong (2000). "Is Malaysia ready to take on e-business?". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Roberts, James A. & Manolis, Chris (2000). "Baby boomers and busters: an exploratory investigation of attitudes toward marketing, advertising and consumerism". *Journal of Consumer Marketing*. 17(6): 481-499.

Rosen, K. T. & Howard, A. L. (2000). "E-retail: gold rush or fool's gold?". *California Management Review*. 42(3): 72-100.

Rowley, Jennifer (2000). "Product search in e-shopping: a review and research propositions". *Journal of Consumer Marketing.* 17(1): 20-35.

Rowley, Jennifer (1998). "Internet food retailing: the UK in context". *British Food Journal*. 100(2): 85-95.

Rowley, Jennifer (1996). "Retailing and shopping on the Internet". *International Journal of Retail & Distribution Management*. 24(3): 26-37.

Ruyter, Ko D., Wetzels, Martin & Kleijnen, Mirella (2001). "Customer adoption of e-service: an experimental study". *International Journal of Service Industry Management*. 12(2).

Sandelands, Eric (1997). "Utilizing the Internet for marketing success". *Pricing Strategy & Practice*. 5(1).

Scheraga, Dan (2001). "2001: A sales odyssey". *Chain Store Age*. 77(1): 96-101.

Scheraga, Dan (2000). "WhatsNext.com". *Chain Store Age*. 76(11): 110-111.

Schiffman, Leon G. & Kanuk, Leslie L. (1997). *Consumer Behavior (International edition)*. Prentice Hall International, Inc.

Schwartz, D. O. (1998). "Sharing responsibility for e-commerce and the privacy issue". *Direct Marketing*. 61(2): 48-51.

Scott, Sarah (1997). "Shopping without worries". *Maclean's*. 110(43): 46.

Shamsul Bahri Zakaria (2000). "Online payment systems: a study if its usage by several companies in Malaysia". *International Conference on Electronic Commerce*. 21-23 Nov, Kuala Lumpur, Malaysia.

Sheth, Jagdish N. & Sisodia, Rajendra S. (1997). *Consumer Behavior in the Future*. Sage Publications, Inc.

Shim, S & Drake, M. F. (1990). "Consumer intention to utilize electronic shopping". *Journal of Direct Marketing*. 4(3): 22-33.

Shirene Shan (June 27, 2001). "Malaysian firms slow in adopting e-business". *News Straits Times*. P25.

Solomon, Stephen D. (1994). "Staking a claim on the Internet". *Inc Technology*. 16(13): 87-90.

Spill, P. & Lohse, G. L. (1998). "A classification of Internet retail stores". *International Journal of Electronic Commerce*. 2(2): 29-56.

Stern, J. (1995). "*World Wide Web marketing – integrating the Internet into your marketing strategy*". John Wiley, New York.

Strader, T. S. & Shaw, M. J. (1999). "Consumer cost differences for traditional and Internet Markets". *Internet Research: Electronic Networking Applications and Policy*. 9(2): 82-92.

Sultan, Fareena & Henrichs, Roy B. (2000). "Consumer preferences for Internet services over time: initial explorations". *Journal of Consumer Marketing*. 17(5).

Susskind, R. (August 1, 2000). "The number's up for the Internet. *The Times*.

Swartz, Nikki (2000). "The anywhere revolution". *Wireless Review*. 17(14): 58-59.

Sweeney, Dan (2001). "Whither e-retailing?". *Chain Store Age*. 77(1): 108-109.

Syed Nasirin, Yuserrie Zainuddin & A. Suhaimi Baharudin (2000). "Exploring the factors associated with electronic commerce implementation success in Malaysia: a government sector perspective". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Talaga, James A. & Tucci, Louis A. (2001). "Consumer tradeoffs in on-line textbook purchasing". *Journal of Consumer Marketing.* 18(1).

Taylor Nelson Sofres (2001). "Global e-commerce report 2001". www.tnsofres.com/ger2001.

Tiersky, Howard (2001). "Raised expectations". *Chain Store Age*. 77(2): 192-193.

Tilden, M. (1996) ."Channel vision". *Retail Banker International*. 28: 12-15.

Torralbas, Alex (2001). "Web may seem global, but it's really local". *Computer World*. 35(6): 32-33.

T. Ramayah, Ung Chee Yeong & Yuserrie Zainuddin (2000). "A study on factors driving electronic commerce initiative and organization readiness". International Conference on Electronic Commerce. 21-23 Nov, Kuala Lumpur, Malaysia.

Trappey, Charles V. & Trappey, Amy J. C. (2001). "Electronic commerce in greater China". *Industrial Management & Data Systems*. 101(5).

Trocchia, Philp J. & Janda, Swinder (2000). "A phenomenological investigation of Internet usage among older individuals". *Journal of Consumer Marketing*. 17(7): 605-615.

Tweney, D. (1998). "The consumer battle over online information privacy has just begun". *InfoWorld*. 20(25): 66.

Van Tassel, S. & Weitz, B. A. (1997). "Interactive home shopping: all the comforts of home". *Direct Marketing*. 59(10): 40-41.

Venkatesh, A. (1998). "Cybermarkets and consumer freedoms and identities". *European Journal of Marketingg*. 32(7): 664-676.

Verity, J. W. (1995). "Bullet-proofing the Net". *Business Week*. P98-99.

Verton, Dan (2001). "Not-so-happy holidays online". *Computer World*. 35(1).

Vijayasarathy, Leo R. & Jones, Joseph M. (2000). "Print and Internet catalog shopping: assessing attitudes and intentions". *Internet Research: Electronic Networking Applications and Policy*. 10(3): 191-202.

Weiss, B. D. (1995). "Four black holes in cyberspace". *Management Review*. P30-33.

Wellbery, B. S. & Wolfe, C. C. (1998) ."Privacy in the information age". *Business America*. 119(1): 12-13.

Westland, C. J. & Au, G. (1998). "A comparison of shopping experiences across three competing digital retailing interfaces". *International Journal of Electronic Commerce*. 2(2): 57-69.

Whiteley, David (2000). *E-commerce: Strategy, Technologies and Applications (International edition)*. McGraw-Hill International, Inc.

White, Gregory K. (1997). "International online marketing of foods to US consumers". *International Marketing Review*. 14(5): 376-384.

Wiersema, William H. & Jones, Kevin (2000). "E-commerce: opportunity or fad?". *Electrical Apparatus*. 53(7): 46-48.

Williamson, Debra A. (2000). "E-tailers missing the mark with flood of web coupons". *Advertising Age*. 71(40): 104-106.

Winner, Langdon (1997). "The neverhood of Internet commerce". *Technology Review*. 100(6): 31.

Whysall, Paul (2000). "Retailing and Internet: a review of ethical issues". *International Journal of Retail & Distribution Management*. 28(11): 481-489.

Woo Siew Chin (July 4, 2001). "Insuring the future online". *News Straits Times: Business Computimes*. P5.

Woo Siew Chin (June 25, 2001). "Securing e-business from online attacks". *News Straits Times: Business Computimes*. P20.

Wymbs, Cliff (2000). "How e-commerce is transforming and internationalizing service industries". *Journal of Services Marketing*. 14(6): 463-477.

Yakhlef, Ali (2001). "Does the Internet compete with or complement bricks-and-mortar bank branches?". *International Journal of Retail & Distribution Management*. 29(6).

Yelkur, Rama (2001). "Differential pricing and segmentation on the Internet: the Case of Hotels". *Management Decision*. 39(4).

Yoegel, R. (1997). More people purchasing from home. *Target Marketing*. 20(4): 24.

Yucelt, U. (1997). Comparative study of shopping styles and their effect on retail management. *Electronic Marketing and the Consumer*. P90-102.

Zellner, W. (May 15, 2000). "Wooing the newbies". *Busineess Week*. P116-120.

The Findings of the Factors Influencing the Adoption of E-Commerce Among Small and Medium-Sized Chalet Operations in Peninsular Malaysia

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ABSTRACT
The aim of the article is to show the findings of the factors influencing the adoption of e-commerce among small and medium-sized chalet operators in Peninsular Malaysia. The principle objective of this study is to investigate the factors influencing the adoption of e-commerce among small and medium-sized chalet operators. Further, to identify the readiness of small and medium-sized chalet operators in dealing with e-commerce activities. Two approaches were undertaken in the study. An extensive library search was carried out to obtain journals, master thesis and doctoral dissertations. The Logistic Regression was applied to test the hypotheses because the dependent variable (e-commerce adoption decision) which was dichotomous in nature.

INTRODUCTION

The tremendous growth of the Internet, has led to the increased number of consumers and firms involved in the on-line economic global marketing. Indeed, the development of technology has changed the market environment permanently (Fojt, 1996) and it is up to the Small and Medium Tourism Enterprises (SMTEs) to regard them as opportunities or challenges to ensure their survival and their capability to do business in the international market. Moreover, the challenge brought up by the new electronic commerce (e-commerce) economy will revolutionize various sectors in the Malaysian economy, such as the tourism industry. E-commerce usage in this context refers to "the sharing of business information, maintaining business relationships and conducting business transactions by means of Internet based technology".

Tourism Industry in Malaysia

In Malaysia, tourism is the third largest foreign exchange earner after manufacturing and oil palm through its vast arrays of tourism products. Tourism is considered to be the contributors of Malaysian economic activities. The vast array of tourism products offered by Malaysian tourism industry include attractive hills and island resorts, international-class shopping facilities, eco-tourism, agro-tourism, homestay programmes, cultural and heritage tourism.

The number of international tourist arrivals and receipts can be used as a measurement to measure tourism industry's contribution towards the Malaysian economy. The following Table 1 demonstrates the number of tourist arrivals and the total tourist receipts in year 1995 and 2000.

As depicted in Table 1, international tourism arrivals and receipts have increased tremendously. The number of tourist arrivals, for example, has increased from about 7.5 million in 1995 to about 10 million in 2000. Similarly, the total tourist receipts has also increased from RM 9,174.9 million in 1995 to RM 17,335.4 in 2000.

Table 1: The number of tourist arrivals and receipts from international tourism

Indicator	1995	2000
Number of Tourist arrivals ('000)	7,469	10,221
By Country of Origin (%)		
ASEAN[1]	73.5	70.3
Japan	4.4	4.5
China	1.4	4.2
Taiwan	3.9	2.1
Hong Kong SAR	2.0	0.7
India	0.4	1.3
Australia	1.8	2.3
United Kingdom	2.2	2.3
USA	1.3	1.8
Others	9.1	10.5
Total Tourism Receipts (RM million)	9,174.9	17,335.4

* Source: The Eight Malaysia Plan 2001-2005

Taking into awareness the importance of domestic tourism, the government has encourage aggressive promotional activities under the theme *Cuti-cuti Malaysia* with the aim of encouraging domestic travel and reducing currency outflows. The number of domestic tourism trips increased by 89.9% at 15.8 million trips in 1999 compared with 8.32 million trips for the period August 1997 to July 1998. The number of domestic guests also increased by 46 % to 1.02 million in March 2000 compared with 698,000 in March 1998. The rapid improvements in the transportation system provided faster and easier access to tourism destinations, which facilitated the increase in domestic tourism.

METHODOLOGY

A survey instrument (questionnaire) was formulated to obtain feedback from *Small and Medium-sized Chalet Operators* assessing their adoption of doing business over the Internet. Table 2 shows the mapping of questions in the survey instrument, which consist of four parts.

Table 2: Mapping survey of questionnaire

Part A	Company's information such as number of employees, rooms and others related information were asked to the respondents
Part B	Information regarding the status of Internet usage such as e-mail, website, and others were asked as measurements of dependent variables
Part C	This section is measuring adoption factors that influencing *Small and Medium-sized Chalet Operators* towards implementing e-commerce in their business. Questions asked are adopted from previous study done by Kendall et al. (2001), with some modification and addition to suite the objective of this study. The items is measured using a five point Likert scale from the range of strongly disagree to strongly agree
Part D	This section is modified and adopted based on Kendall's study (2001), which was formulated based on the possible levels of e-commerce discussed in European Commission (1998). Respondents are needed to answer based on the scale provided to indicate how soon they are willing to adopt different stages of doing business over the Internet and e-commerce, as well

Data Collection

The survey questionnaire was disseminated to Small and Medium-sized Chalet Operators by mail and a few *enumerators* . In order to encourage participation, an endorsement letter from Ministry of Cultural, Art and Tourism (MOCAT), a cover letter explaining the purpose of the study and a reply self-address returned envelop were enclosed. A total of 59 questionnaires were received and collected within a period of six months with a 29.5% of response rate. However, only 56 questionnaires were classified as valid.

General profile and summary statistics

Several demographic characteristics of the respondents were discussed and shown in Table 3. A total of 67.9 percent (%) of the small and medium-sized chalet operators involved in this study were located in Pahang and

10.7% in Terengganu. Perak, Kedah and Selangor each had 5.4% of the sample population. Only 3.6% were located in Johor and 1.8% in Kelantan.

In terms of categorisation, most of the respondents were located in the island area (69.1%), followed by the beach area (23.6%) and hill area (3.6%), while the city and lake areas each had 1.8% of the sample population. The number of rooms available and the extent of labour (employees) employed by the chalet operators were used as the measurement to determine the size of the small and medium-sized chalet operators, whether they were small, medium or large. The majority of the respondents (68.6%) reported to employ less than 10 employees in their resort. About 15.7% employed between 10 to 20 employees, 2.0% between 20 to 30 employees, 3.9% between 30 to 40 employees, and 9.8% employed more than 40 employees.

Out of 56 chalet operators involved in this study, 12.5% of them have less than 10 rooms. Most of them (30.4%) however, have from 11 to 20 rooms. Meanwhile, 26.8% have between 21 to 30 rooms and only 7.1% offered between 31 to 40 rooms. About 23.2% offered 41 to 50 rooms. The result also showed that most of the small and medium-sized chalet operators were found to be established in the nineties (1991 to 2000), totaling 56.6%, whereas 24.5% were established between the year 1981 to 1990 and 9.4% before 1981 and between the years 2001 and 2003.

Table 3: Sample characteristics

Location	Frequency	Percent(%)
Perak	3	5.4
Kelantan	1	1.8
Pahang	38	67.9
Kedah	3	5.4
Johor	2	3.6
Terengganu	6	10.7
Selangor	3	5.4
Categorisation	Frequency	Percent(%)
City area	1	1.8
Island area	38	69.1
Hill area	2	3.6
Beach area	13	23.6
Lake area	1	1.8
Number of Employees	Frequency	Percent(%)
Less than 10	35	68.6
11 to 20	8	15.7
21 to 30	1	2.0
31 to 40	2	3.9
More than 40	5	9.8
Number of Rooms/Chalets	Frequency	Percent(%)
less than 10	7	12.5
11 to 20	17	30.4
21 to 30	15	26.8
31 to 40	4	7.1
41 to 50	13	23.2
51 and above		
Date of Establishment	Frequency	Percent(%)
Before 1980	5	9.4
1981 to 1990	13	24.5
1991 to 2000	30	56.6
2000 to 2003	5	9.4

Based on the figures presented in Table 4, a high percentage of small and medium-sized chalet operators (41.56%) had reported to own only one unit of PC. About 18.9% owned two units of PCs, while 5.7% of them reported to have three and four units of PCs. Those with five, six and eight PCs constitute 3.8%, 1.9% and 1.9% respectively, followed by those with ten PCs with 3.8%. None of the respondents have seven or nine PCs, while 17.0% of them reported not having PCs.

Table 4: Number of Personal Computers

Items	Frequency	Percent (%)
0	9	17.0
1	22	41.5
2	10	18.9
3	3	5.7
4	3	5.7
5	2	3.8
6	1	1.9
7	0	0.0
8	1	1.9
9	0	0.0
10	2	3.8

The level of participation in the Internet usage, covering the Internet connection, e-mail, website, on-line chalet reservation, and on-line payment to/from suppliers/customers, will be used as the measurement to measure participation in e-commerce. Table 5 provides the status of Internet usage among the respondents surveyed. Most of the respondents reported to have Internet access, e-mail, and website with 68.5%, 69.2% and 64.2% respectively. Meanwhile, 56.9% of them reported to be involved in on-line chalet reservation and 21.6% of them are involved in receiving electronic payment from their customers. None of the respondents were involved in electronic payment to suppliers.

Table 5: Status of Internet usage

Items	Frequency	Percent (%)
Internet access	37	68.5
E-mail	36	69.2
On-line chalet reservation	29	56.9
Website	34	64.2
Payment from customers	11	21.6
Payment to suppliers	0	0

According to Table 6, most of the respondents began to have Internet connection in year 2000 with 30.3%, followed by year 2001 and 1999 with 18.2% and 18.2% respectively. A few of the respondents began to have Internet connection prior to 1999.

Table 6: Year of having Internet connection

Year	Frequency	Percent (%)
1999	2	8.7
2000	3	13.0
2001	2	8.7
2002	3	13.0

Respondents who have Internet access were also asked the reason why they use the Internet (As in Table 7). "Providing customers information" was the main reason at 61.5%, followed by "Communication within/outside the company" at 48.1%, and an effort to "Enhance the image of the company" at 46.2%. "Getting information from suppliers" and "Buying and selling products and services" were also among the reasons for having Internet connection with 36.5% and 34.6% respectively. Table 7 summarised the reason for using Internet.

Table 7: Reasons of using Internet

Items	Frequency	(%)
Communication within/outside the company	25	48.1
Getting information from suppliers	19	36.5
Providing customers information	32	61.5
Company's image enhancement	24	46.2
Buying and selling products/services	18	34.6

This study also found that 6.9% of the respondents had launched their own website in 2003, 1999, 1998 and 1997. The majority of them had launched their website in 2001 with 31.0%, followed by 20.7% and 17.2% in 2000 and 2002 respectively, as Table 8 demonstrates.

Table 8: Year of launching website

Year	Frequency	Percent (%)
1994	1	3.0
1996	1	3.0
1997	1	3.0
1998	3	9.1
1999	6	18.2
2000	10	30.3
2001	6	18.2
2002	4	12.1
2003	1	3.0

Among the five items constructed to measure the reason of having a website, most of the respondents ranked "Provide information to customers" as the main reason at 60.8%. Those who ranked "Advertisement", "Explore new model of business", and "Gain competitive advantage" constitute 51.0%, 47.1% and 44.2% respectively. "Pressure from competitors" was ranked as the lowest with 8.7%. The summary of the results as ranked by the respondents and mean value of each statement is summarised in Table 9.

Table 9: Reasons of having website

Items	Frequency	Percent (%)
Gain competitive advantage	23	44.2
Explore new model of business	24	47.1
Pressure from competitors	11	21.6
Provide information to customers	31	60.8
Advertisement	26	51.0

Logistic regression

The logistic regression technique was applied to test the research hypotheses. The significance of the hypothesized independent variables were examined to determine support for the hypotheses.

The model for Chi-Square shows a value of 12.598, which is the difference between the initial -2 log likelihood (75.837) and the final -2 log likelihood (63.239). The model (Chi-Square = 12.598; Significance = 0.027) indicates that the logistic regression model is significantly different from a perfect model, which correctly classifies all respondents into their respective groups: adopters and non-adopters. The goodness of fit statistics was measured to test the goodness of fit of the model using the observed and predicted number of events, by using the Hosmer and Lemeshow test. The goodness of fit is 7.536, distributed as a Chi-Square value, with significance of 0.375. This study found an insignificant probability, which indicates that, the expected and observed values are close, in-turn implying that the model is a good fit.

Therefore, the model does appear to fit, confirming the change in -2 log likelihood test (test of model). In terms of measurement for the accuracy of prediction, the overall predictive accuracy in this model is 75.0%, which can be considered as good. Even though the model fits the data and is relatively high in its predictive accuracy, the relationships between variables are low (Cox & Snell = 0.201; Nagelkerke = 0.272). Table 10 demonstrates the figures of findings.

Table 10: Model Fit Statistics

- 2 Log Likelihood		63.239	
Goodness of Fit		7.536	
Cox & Snell – R^2		0.201	
Nagelkerke – $R^$		0.272	
		75.0	
Percentage correct in classification table			
	Chi-Square	df	Significance
Model	12.598	5	0.027
Block	12.598	5	0.027
Step	12.598	5	0.027

The values in the equation were obtained from the output of the logistic regression.

The original value is in the log of the odds, or logit. Therefore, the beta coefficient (β-coefficient) is the effect of a one-unit change in an independent variable on the log odds. In organizational readiness, for instance, the effect is to increase the log odds by 0.018. As the individual factors, the significance for inhibitors was significantly

different from zero (less than the α-value of 0.05). Meanwhile the significance for the other four variables was not significant.

The first hypothesis was "H_1 = The greater level of benefits perceived by small and medium-sized chalet operators, the more likely they will adopt e-commerce". The significance value for perceived benefits was 0.211, which is higher than the α-value of 0.05. Therefore, H_1 was rejected and there is no significant relationship between perceived benefits and adoption decision. The second hypothesis was "H_2 = The greater level of organizational readiness, the more likely they will adopt e-commerce". This hypothesis was rejected because the significance value for organizational readiness was 0.829, which is greater than the α-value of 0.05. The third hypothesis was "H_3 = The greater level of external pressure, the more likely they will adopt e-commerce". The relationship between external pressure and adoption was found to be insignificance because the significance level (0.998) was higher than the α-value (0.05). The fourth hypothesis was "H_4 = The greater level of inhibitors perceived by small and medium-sized chalet operators, the less their involvement towards adopting e-commerce". This hypothesis was deemed acceptable because the significant value is 0.014, which is lower than the α-value. Therefore, there is a significant relationship between adoption and inhibitors.

The tested hypotheses explained significant proportions of the variables representing factors that motivate and inhibit the adoption of e-commerce. Table 12 contains a summary of the hypotheses tested.

Table 12: Summary of the hypotheses tested

	Hypothesis	Rejected or Accepted
H_1	The greater level of benefits perceived by small and medium-sized chalet operators, the more likely they will adopt e-commerce	Rejected
H_2	The greater level of organisational readiness, the more likely they will adopt e-commerce	Rejected
H_3	The greater level of external pressure, the more likely they will adopt e-commerce	Rejected
H_4	The greater level of inhibitors perceived by small and medium-sized chalet operators, the less their involvement towards adopting e-commerce (Inhibitors to adopt e-commerce were found to be significant. This findings support the view that small and medium-sized chalet operators have been slowed to embrace e-commerce due to a number of obstacles to e-commerce application, such as security concern (mean value 3.25), difficulties with current practice (mean value of 3.04), lack of financial resources (mean value of 2.84) and lack of guidance (mean value of 2.95)).	Accepted

RESULTS AND DISCUSSION

This study clarified the relationship between the dependent (e-commerce adoption decision) and independent variables in the model presented in Figure 1. A significant relationship was found between inhibitors and adoption decision, as represented by the arrows in Figure 2.
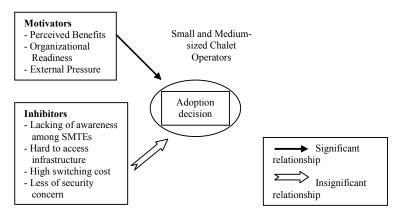
Figure 2: Relationship between dependent and independent variables

As for the factors related to motivators of e-commerce and adoption decision, perceived benefits, organisational readiness and external pressure were found to be insignificant. Even though a number of previous studies have reported that perceived benefits, organisational readiness and external pressure have an effect on the adoption

decision of new technology (Mehrtens et al., 2001; Kendall et al., 2001; Poon and Swatman, 1999; Premkumar et al., 1999; Iacovou et al., 1995; Cragg and King, 1993). Iaocovou et al. (1995) for example, showed a strong relationship between adoption and perceived benefits. Meanwhile Premkumar et al. (1999) found that perceived benefits as the only significant variable to discriminate adopters from non-adopters in the communication technology adoption decision. Besides, they also discovered that top management support (items discussed under organizational readiness), size and competitive pressure (items discussed under external pressure) as an important determinant for the adoption decision.

Theoretically, perceived benefits, organizational readiness and external pressure has a positive relationship towards adoption decision. This study, however; fails to find any significant relationship between those variables with the adoption decision. The differences exist due to several reasons.

Previous research on adoption decision have been on different subjects, such as rural communities in a mid-western state in United of States (Premkumar et al., 1999); Information System (IS) managers (Chau and Tam, 1997); suppliers to British Columbia (BC) government (Iacovou et al., 1995); owners and managers in the automobile industry (Akkeren and Cavaye, 1999); members of the Association of Small and Medium Enterprises of Singapore (Thong and Yap, 1999; Kendall et al., 2001); small business in Netherland (Walzuch et al., 2000); and small business in Australia (Poon and Swatman, 1999).

In comparison, this study sought to investigate the chalet operators in Tioman Island, which was not done before and used a combination of theoretical models, as presented in Figure 1. The findings in this study can be similar to or differ from previous studies in several aspects. This study differs from previous studies in the following aspects: (1) it investigates subjects in the tourism industry; (2) subjects being studied have a different culture and social system; and (3) relatively small respondents.

Specifically, this study differs from Thong and Yap (1996), who were concerned with factors that affect IT adoption, such as CEO innovativeness, attitude towards IT adoption, competitive of environment and information intensity, while this study was concerned with all the sources being discussed by Tong and Yap (1996) and has included more variables to support the study.

This study differs from Kendall et al. (2001), who had utilised a portion of Rogers' Model of Innovation as their framework, whereas this study has combined several aspects from Rogers' model and others research models.

This study also differs from Mehrtens et al. (2000), who identified similarities and differences between Internet adoption and EDI adoption in small firms. They used Iacovou's theoretical framework as their model, whereas this study was done to identify the factors that motivate and inhibit e-commerce adoption in Small and Medium-sized Chalet operators.

Tiessen et al. (2001) only investigated the reason why firms use e-commerce by relating two types of environmental variables (market changes and industry norms) and three firm factors (technical capability, cultural capability and firm size), whereas this study investigates multi-dimensional reasons why firms make a decision to adopt or not to adopt e-commerce.

This study also differs from Chambers and Parker (2000), in using a more comprehensive model incorporating the factors that are motivating and inhibiting rural small businesses' use of web commerce. Meanwhile this study did not include individual factors, for example education, age, personal traits, time and skill, cultural aspects and task factors, as Chamber and Parker investigated in their study.

From the tourism studies perspectives, this study differs from Buhalis and Main (1998) who worked on small and medium hospitality organisations, whereas this study worked on chalet operators (SMTEs). In addition, Buhalis and Main (1998) did explore the factors determining the adoption of IT's by examining the stakeholders of small hospitality organisations, as well as the push and pull factors they exercise. Meanwhile this study is focused to determine the factors that motivate and inhibit the adoption decision.

The inconsistencies between this research with previous research have led us to the conclusion that a socio-cultural issue might give an impact on the adoption decision. Culture, according to Assael (1987) refers to the norms, beliefs and customs that are learned from society and lead to common patterns of behaviour. Different cultures influence how people may perceive certain things, what they value and how they interpret the graphical images and lines of text they encounter on a website. Therefore, people from different countries may react in different ways because they are physically different, and have different climates, economics, religion and history (Williams, 1991).

This view is supported by Dr Mahathir Mohamad, (the Malaysian Prime Minister, 1996)

> *"The tendency has always been to forget culture entirely when dealing with technology and development. The result is that importation of foreign technology and concepts of development have been disappointing to a good many developing countries. The interplay of technology, culture and development, while it can be complementary, can also tear a society apart if not fully appreciated, integrated and guided. For a society, technology transfer is not possible or at least not easy to achieve. The point that is being made here is that before technology can be successfully transferred or while it is performed, the cultural resistance must be overcome. This can only be done if there is understanding of the culture of the transferee community, or better still, the difference in culture of the transferors and the transferees".*

According to Aljifri, Pons and Collins (2003), the prevalence of the English language in Internet technology can also be a reason for companies especially where English is not the predominant language, to be excluded from participating in e-commerce. Moreover, converting to English language would mean giving up part of the organization's culture (Bonits and Decastro, 2000).

The difference in results may also be due to the uncertainty avoidance factor. Uncertainty avoidance factor refers to the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity (Nobes and Parker, 1998). Malaysian Small and Medium-sized Chalet operators might be afraid to try and adopt something considered as new to their business culture, even though benefits of adopting new technology such as e-commerce have been constantly advocated by previous researchers. The uncertainties about the benefits can be gained in the future; keen competition and demand uncertainties might also be a reason for the Small and Medium-sized Chalet operators to simply take a wait-and-see attitude (Chau and Tam, 1997). Therefore, if the first adopters were to think only of their own immediate benefits, rather than about how they might eventually benefit or how their organisation might benefit, no one would adopt and the diffusion process of the innovation would never begin (Rogers, 1995).

In addition, Rogers (1995) noted that computer related innovations could create uncertainties in an organization and uncomfortable states in a system that often leads to resistance to the technology. Gerwin (1988) had identified three different types of uncertainties in computer-aided manufacturing technologies. These are (1) technical uncertainty; (2) financial uncertainty; and (3) social uncertainty.

From a different perspective, the result of this study is consistent with Chau and Tam (1997), whom worked on the factors affecting the adoption of open systems. Their study also failed to find a relationship between the external environment context and perceived benefits with open systems adoption.

Conversely, inhibitors to adopt e-commerce were found to be significant. This findings support the view that Small and Medium-sized Chalet operators have been slowed to embrace e-commerce due to a number of obstacles to e-commerce application, such as security concern (mean value of 3.25), difficulties with current practice (mean value of 3.04), lack of financial resources (mean value of 2.84) and lack of guidance (mean value of 2.95). Technophobia be can also regarded as a reason why Small and Medium-sized Chalet operators refused to be involved in e-commerce activities (Paraskeras and Buhalis, 2002). The findings were somehow consistent with the research done by Paraskeras and Buhalis, (2002); Ankar and Walden, (2001), in which they found that inhibitors had association with the e-commerce adoption decision

SUMMARY AND CONCLUSION

The study investigates factors that motivate and inhibit Small and Medium-sized Chalet operators adoption of e-commerce. The principal objectives of the study are to determine the extent of usage of the Internet facilities and e-commerce among Small and Medium-sized Chalet operators. This study proved that inhibitors to adopt e-commerce were found to be significant. This findings support the view that Small and Medium-sized Chalet operators have been slowed to embrace e-commerce due to a number of obstacles to e-commerce application such as security concern, difficulties with current practice, lack of financial resources and lack of guidance. However, the limitations of this study which affect the results include several aspects, which give pointers for future research in this area. Firstly, data were obtained from chalet operators through mail questionnaires, and therefore the number of responses can be questioned. The major drawback of mail questionnaires is the low response late and any doubts the respondents might have cannot be clarified. The relatively small sample size (response rate = 29.5%) is due to the disadvantage of the mail questionnaire method, which has limited generality for the whole tourism industry Nevertheless, the results can form a benchmark, the basis to which to improve future findings. Secondly, there were insufficient resources available; especially in the Malaysian context had affected the development of a more precise theoretical framework for this study. Thirdly, the number of chalet operators was limited because many of them have ended their own business. This problem maybe was caused by the very windy and unstable climate which generates big waves. Finally, this study was

largely constrained by time and money, so it was not possible to study more variables such as family-oriented businesses, market uncertainties and complexity of IT infrastructure.

This research was exploratory in nature, and only intended to identify factors that are motivating and inhibiting the e-commerce adoption decision. Therefore, this research supporting that inhibitors is the major factors of why Small and Medium-sized Chalet operators reluctant to adopt e-commerce. More extensive research is required to examine these factors closely. Specific future research possibilities arising from this research are:

i.   Conducting more extensive and representative qualitative study to determine the extent to which the factors that are really inhibiting Small and Medium-sized Chalet operators adoption of e-commerce. Therefore, the result of future findings will suggest to the government, for example, to more focus towards decreasing inhibitors factors as a method to increase Small and Medium-sized Chalet operators involvement in adopting e-commerce.

ii.   Socio-cultural issues (cultural and language differences) and their impact on Small and Medium-sized Chalet operators commitment and adoption decision can also be a part of future research;

iii. Other factors such as family oriented businesses, market uncertainties, complexity of IT infrastructure and information intensity can also be researched further and added to the theoretical framework.

iv.   Determining whether the factors identified are also applicable in other contexts, such as in travel agencies and also whether they apply to Small and Medium-sized Chalet operators generally; and

v.   Undertaking research focused on other Small and Medium-sized Chalet operators in Asian country, such as Thailand and Philippines. Hence, the result in Malaysia can be compared to other Asian country in order to determine how the inhibiting factors can be addressed and better facilitated.

The major findings of the study include that Small and Medium-sized Chalet operators experienced inhibitors as obstacles from adopting e-commerce. On one extreme, perceived benefit, organizational readiness, and external pressure failed to prove that they are the most important factors motivating e-commerce adoption by Small and Medium-sized Chalet operators. They can contribute by making a full list of all the operating chalets on the website in order to attract tourists from all around the world. Moreover, the facilities and infrastructures should be upgraded to improve the security and safety of the tourists. In addition, training should also be provided to the chalet operators in IT field in order to draw attention from the government where the government can provide loan without or with lower interest to the chalet operators. Here, good accommodation and communication through IT usage can attract many tourist. This study also suggested major recommendations for the Malaysian government, especially in the tourism sector and provided directions for future research.

REFERENCES

Abdul Aziz, A.A. & Pillai, S. (1996). *Mahathir: Leadership and vision in science and technology*. Selangor: Academy of Science Malaysia and Universiti Putra Malaysia Press

Abdul Rahim, A.B., Salniza, M.S., Zolkafli, H. & Fariza, H. (2000). E-Commerce adoption among companies in Malaysia. *Proceeding of the International Conference on Electronic Commerce*. Malaysia

Abell, W. & Lim, L. (1996). Business use of the Internet in New Zealand: an exploratory study. *Proceeding of the second Australian World Wide Web Conference* [Online] Available http://ausweb.scu.edu.au/aw96/business/abell/index.htm (21 February 2002)

Ainin, S. & Rohana, J. (2000). E-commerce implementation in Malaysian manufacturing sector. *Proceeding of the International Conference on Electronic Commerce*. Malaysia

Akkeren, J.V. & Cavaye, A.L.M. (1999). Factors affecting the adoption of e-commerce technologies by small business in Australia-an empirical study [Online] Available http://www.acs.org.au/act/events/io1999/akkern.html (14th February 2002)

Aljifri, H.A., Pons, A. & Collins, D. (2003). Global e-commerce: a framework for understanding and overcoming the trust barriers. *Information Management & Computer Security*, 11(3), 130-138

Anckar, B. & Walden, P. (2001). Introducing web technology in a small peripheral hospitality organization. *International Journal of Contemporary Hospitality Management*. 13(5), 241-250

Ash, T. (1998). Seven reasons why Internet project fail. *Performance Computing*, 16(11), 15-16

Assael, H. (1987). *Consumer behavior and marketing action*. 3rd ed. PWS-Kent: Boston, MA. In Slowikowski, S. & Jarrat, D.G. (1997). The impact of culture on the adoption of high technology products. *Marketing Intelligence and Planning*, 15(2), 97-105

Baines, A. (1995). Technology and tourism. *Work Study*, 47(5), 160-163

Bloch, M. & Seger, A. (1997). The impact of electronic commerce on the travel industry. *Proceeding of the 31st Hawaii International Conference on System Sciences*. Hawaii. In Turban, E., Lee, J., King, D. & Michael C. H. (2000). *Electronic commerce: A managerial perspective*. New Jersey: Prentice Hall International, Inc.

Bonits, N. & De Castro, A. (2000). The first World Congress on Management of Electronic Commerce: review and commentary. *Internet Research: Electronic Networking Applications and Policy*, 10(5), 365-374.

In Aljifri, H.A., Pons, A. & Collins, D. (2003). Global e-commerce: a framework for understanding and overcoming the trust barriers. *Information Management & Computer Security*, 11(3), 130-138

Buhalis, D. & Main, H. (1998). Information technology in peripheral small and medium hospitality enterprises: strategic analysis and critical factors. *International Journal of Contemporary Hospitality Management*. 10(5), 198-202

Buhalis, D. (1998). Strategic use of information technologies in the tourism industry. *Tourism Management*, 19(5), 409-421

Chambers, T.A. & Parker, C.M. Factors motivating and inhibiting the use of web commerce by rural small businesses. [Online] Available http://www.deakin.edu.au/mis/research/working_Papers_2000/2000_05_Parker.pdf (31st June 2002)

Chan, B. & Suliman, A.H. (2002). The development of e-commerce in Singapore: the impact of government initiatives. *Business Process Management Journal*. 8(3), 278-288

Chang-tseh Hsieh & Binshen Lin. (1998). Internet commerce for small businesses. *Industrial Management & Data Systems*, 98(3), 113-119

Chapman, P. Moore, M.J., Szczygiel, M. & Thompson, D. (2000). Building Internet capabilities in SMEs. *Logistic Information Management*, 13(6), 353-361

Chau, P.Y.K. & Tam, K.Y. (1997). Factors affecting the adoption of open systems: an exploratory study. *MIS Quarterly*. 21(1), 24-53.

Cragg, P.B. & Malcolm, K. (1993). Small-firm computing: motivators and inhibitors. *MIS Quarterly*, 17(1), 47-61

Debrecency, R., Putterill, M., Tung, L. & Gilbert, A. (2002) L. New tools for the determination of e-commerce inhibitors. *Decision Support System*. 34, 177-195

Fatimah, M.A., Kusairi, M.N. & Mohd Fuaad, A. (2000). E-commerce adoption in Malaysia: problems and barriers from the firms' perspective. *Proceeding of the International Conference on Electronic Commerce*. Malaysia

Fisher, M. (2000). Using e-commerce to deliver high productivity. *Work Study*, 49(2), 59-62

Foong, S.Y, Zainal Abidin, K. & Syed Kadir, A. (1994). The effectiveness of information technology (IT) adoption by the SMEs in the electrical and electronic sector- problems, issues and policy perspectives. *Malaysian Journal of Small and Medium Enterprises*, 5, 24-38

Goldsmith, A. & Mohd Zahari, M.S. (1994). Hospitality education in Malaysia: filling the skill gap. *International Journal of Contemporary Hospitality Management*. 6(6), 27-31

Iacovou, C.L. & Benbasat, I. (1995). Electronic Data Interchange and small organizations: adoption and impact of technology. *MIS Quarterly*, 19 (4), 465-486

IDC (2002). Malaysia's SMEs see huge ICT opportunities, according to IDC. [Online] Available http://www.idc.com.my (28 August 2002)

ISPO. (1997). An European initiative in electronic commerce. [Online] Available www.ispo.cec.be/Ecommerce (29 August 2002)

ITIS (2002). E-commerce applications capability and current status. [Online] Available www.itis.org.tw/forum/content4/01if39d.htm (29 August 2002)

Jeffcoate, J., Chappel, C. & Feindt, S. (2002). Best practice in SME adoption of e-commerce. *Benchmarking: An International Journal*, 9(2), 122-132

Jemmeson, P. (1997). Using Internet for competitive advantage. *Industrial Management & Data Systems*, 97(4), 139-142

Kendall, J., Tung L.L., Chua, K.H., Ng, C.H.D & Tan, S.M. (2001).Electronic commerce adoption by SMEs in Singapore. *Proceeding of the 34th Hawaii International Conference on System Sciences*. Hawaii

Kowtha, N.R. & Timothy Whai IP Choon. (2001). Determinants of website development: a study of electronic commerce in Singapore. *Information & Management*, 39(3), 227-242

Lea, J. (1993). *Tourism and development in the third world*. Great Britain: Richard Clay Ltd.

Lee-Ross, D. (1998). Comment: Australia and the small to medium-sized hotel. *International Journal of Contemporary Hospitality Management*. 10(5), 177-179

Lefebvre, E. & Lefebvre, L.A. (2000). Information and telecommunication technologies: the impact of their adoption on small and medium-sized enterprise. [On-line] Available www.idrc.ca/acb/showdetl.ofm?&DID (31 August 2002)

Ling, C.Y. (2001). Model of factors influences on electronic commerce adoption and diffusion in Small & Medium-sized Enterprise. [Online] Available http://ecis2001.fov.univ_mb.si/doctorak/Students/ECIS-DC_Chong.pdf (27th June 2002)

McIntosh, R.W. & Goeldner, C.R. (1990). *Tourism principles, practices philosophies*. 6th ed. USA: John Willey & Sons, Inc

Mehrtens, J., Cragg, P.B. & Mills, A.M. (2001). A model of Internet adoption by SMEs. *Information Management*, 39(3), 165-176

Moha Asri Abdullah. (1999).The accessibility of government-sponsored support programmes for small and medium-sized enterprises in Penang. *Cities*, 16(2), 83-92

Morrison, A. & Thomas, R. (1999). The future of small firms in the hospitality industry. *International Journal of Contemporary Hospitality Management.* 11(4), 148-154

MYNICSTATISTICS. (2002). [Online] Available http://www.mynic.net (26 September 2002)

OECD. (1998). Small and Medium-sized enterprises and electronic commerce. [Online] Available http://ottawaoecdconference.com/ english/announcement/ ecomm4_2.pdf (15th August 2002)

Palmer, A. & McCole, P. (2000). The role of electronic commerce in creating virtual tourism destination marketing organization. *International Journal of Contemporary Hospitality Management.* 12(3), 198-204

Paraskevas, A. & Buhalis, D. (2002). Outsourcing IT for small hotels: the opportunities and challenges of using application service providers. *Cornell Hotel and Restaurant Administration Quarterly*, 27-39

Patrick, Y.K.C. & Tam, K.Y. (1997). Factors affecting the adoption of open systems: an exploratory study. *MIS Quarterly*, 21(1), pl (24)

Pin, L., Jantan, M. & Nasirin, S. (2000). Factors influencing e-commerce adoption in service industry:a Malaysian panorama. *Proceeding of the International Conference on Electronic Commerce.* Malaysia

Poon, S & Swatman, P.M.C. (1997). Small business use of Internet: findings from Australian case studies. *International Marketing Review*, 14(15), 385-402

Poon, S. & Swatman, P.M.C. (1999). An exploratory study of small business Internet Commerce Issues. *Information & Management*, 35(1), 9-18

Premkumar, G. & Robert, M. (1999). Adoption of new information technologies in rural small business. *Omega*, 27, 467-484

Prescott, M.B. (1997). Understanding the Internet as an innovation. Industrial Management & Data Systems, 97(3), 119-124

Scupola, A. (2003) The adoption of Internet commerce by SMEs in the south of Italy: an environmental, technological and organizational perspective. *Journal of Global Information Technology Management,* 6(1), 52-71

Slowikowski, S. & Jarrat, D.G. (1997). The impact of culture on the adoption of high technology products. *Marketing Intelligence and Planning*, 15(2), 97-105

Soderquist, K., Chanaron, J.J. & Motwani, J. (1997). Managing innovation in French small and medium-sized enterprises: an empirical study. *Management & Technology*, 4(4), 259-272

Soh, C., Mah, Q.Y. & Gan, F.J. (1997). The use of the Internet for business: the experience of early adopters in Singapore. *Internet Research: Electronic Networking Applications and Policy*, 7(3), 217-228

Sulaiman, M. & Hashim, M.K. (2002). Revisiting the issues and research agenda for SMEs in Malaysia. [On-line] Available www.usm.edu.my (8 September 2002)

Thomas, R. (1995). Public policy and small hospitality firms. *International Journal of Contemporary Hospitality Management*, 7(2), 69-73

Thomas, R., Friel, M. & Jameson, S. (1999). Small Business Management. In *The handbook of contemporary hospitality management research*, ed. Brotherton, B, 497-512. West Sussex: John Wiley & Son Ltd

Thompson, S.H. Teo, Vivien K.G. Lim & Raye Y.C.Lai. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega*, 27(1), 25-37

Tiessen, J.H., Wright, R.W. & Turner, I. (2001). A model of e-commerce use by internationalizing SMEs. *Journal of International Management*, 7(3), 211-233

Tonartzky, L.G., & Fleisher, M. (1990). *The processes of technological innovation.* 1st ed. Canada: Lexington Books

Turban, E., Lee, J., King, D. & Michael C.H. (2000). *Electronic commerce: A managerial perspective.* New Jersey: Prentice Hall International, Inc.

Wanhill, S. (2000). Small and medium tourism enterprises. *Annals of Tourism Research.* 27(1), 132-147

Yap, C.H. & Thong, J.Y.L. (1996). Factors affecting information technology adoption in small business. *Malaysian Journal of Small and Medium Enterprises.* 7, 61-75.

Yeoh, E.L. (2000). Assistance needed by small and medium-sized industries to adopt electronic commerce in Sabah. *Proceeding of the International Conference on electronic commerce.* Malaysia

Yuserrie, Z. Ramayah, T. & Yeong, U.C. (2000). A study on factors driving e-commerce initiative and organizational readiness. *Proceeding of the International Conference on Electronic Commerce.* Malaysia

Banking in the Era of Globalization:
Why Bankers should Focus on 'Relationship Banking' with their Small Business Customers?

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INTRODUCTION

Forces of globalization fuelled by advances in information technology and the growing financial sophistication of customers have changed the banking environment during the last decade. This has resulted in intensified competition among the existing and new players in the market place. The key to success or even surviving in an increasingly competitive environment requires an increasingly deeper understanding by banks of this environment and to capitalize on opportunities associated with it. Banks are now finding themselves in the situation whereby they are having to work harder to retain customers that they once had the luxury of taking for granted. One of the strategies is for the banks to establish and maintain strong relationships with their customers. Seybold (2001) argues that building deep relationship with customers is vital to ensure the maintenance of future earnings. Banks need more effective approach to an understanding of customers and their needs. However, one increasingly important segment of the market, which arguably has not been given enough attention, is the small business sector. The small business sector is now a significant and growing market segment and its importance to the economic development of a nation is well established. The banks may miss the opportunity of an emerging lucrative market if they fail to recognize the potential profitability that this sector provides. Studies by Kolari, Berney & Oui (1997) and Dunkelberg (1997) revealed that, on average, banks earn higher profit margin on small business loans than on other assets. Furthermore, if banks focus mainly on large customers, this could lead to smaller margins. These customers have a readily available source of funding through the capital market, and hence the additional negotiating advantage. As a result, large business customers may no longer provide the profit potential they once did. Therefore, the ability to attract and retain small business customers should be in the long-term interest of the bank.

This paper reports on a study conducted among small business owners on their business relationships with the banks. The purpose is to generate an understanding of the nature of bank-small business customer relationships in Malaysia. The findings of the study will provide banks with information that may put them in a better position to understand the needs of their small business customers.

LITERATURE REVIEW

WHAT IS A SMALL BUSINESS?

There is no commonly held definition of what constitutes a small business. A business may be regarded as 'small' if it has certain economic or management characteristics. For example, Watson & Everett (1993) define it as a business in which one or two persons are required to make all the critical management decisions in finance, accounting, personnel, purchasing, processing, servicing, marketing or selling without the aid of internal specialists and with specific knowledge in only one or two functional areas. Storey (1982) categorizes a small business as that of having a small market, being managed by the owners who are legally independent in taking their decisions. In Malaysia, various criteria have been used to classify the business for the purpose of allocating technical or financial assistance. The Small and Medium Industries Development Corporation (SMIDEC), an agency under the Ministry of International Trade and Industry (MITI) defines it as a manufacturing enterprise with an annual sales turnover of not exceeding RM25 million or as a business enterprise which employs up to 150 full-time workers (Smidec, 2002). The World Bank study on Malaysian industries considers the small business enterprises as those employing between 5 to 49 full-time employees, and the medium-sized enterprises as having between 50 to 199 employees (UNIDO, 1990).

For the purpose of this study, the term 'small business' is used to indicate the small and medium sized enterprises (SMEs) or industries (SMIs) as defined by the Central Bank of Malaysia. Under this definition, SMEs or SMIs are those registered businesses with net assets of up to RM2.5 million or in the case of limited companies, with shareholders' funds of not more than RM2.5 million. Definition by the Central Bank is strictly observed in all commercial bank lending in Malaysia. The small business sector, therefore, refers to all businesses that fulfill the above definition. A great majority of these businesses are independently owned and operated by individuals and families.

WHAT IS RELATIONSHIP BANKING?

The acceptance and application of relationship banking have grown in the banking sector where an emphasis is being placed on the management of customer relationships (Barnes & Howlett, 1998; Dibb & Meadows, 2001). According to Moriarty, Kimball & Guy (1983), relationship banking is a recognition that a bank can increase its earnings by maximizing the profitability of the total customer relationship over time, rather than by seeking to extract the most profit from any one individual product or transaction. Because most banking customers purchase many products and services, and do so on recurring basis, the bank must build and maintain a number of product or service relationships to reach the full potential of the customer. Relationship banking emphasizes deeper penetration of the existing customer base. Main (1982) argues that in relationship banking, the customer gets to deal with a real human being, preferably one who is knowledgeable and courteous and who will get to know his name. What the customer seems to want more than anything else is a sense of importance, like being recognized by a head waiter. Levitt (1983) says that the relationship between a seller and a buyer seldom ends when a sale is made. Increasingly, the relationship intensifies after the sale and helps determine the buyer's choice the next time around. In banking, becoming the designated supplier requires successful passage through several consecutive gates or stages in the sales process.

Relationship banking can also be seen as the bank's relationship with the customer that is not confined to contact when a credit limit is exceeded, or a new application made for a loan, but which is renewed on a regular basis so that the banker builds up a real understanding of the firm's progress and financial needs (Read, 1998). The underlying principle behind relationship banking is that banks can enhance customer satisfaction and in so doing can enhance their own performance. For such benefits to accrue, relationships must be developed and managed to the customer's satisfaction.

BANK-SMALL BUSINESS RELATIONSHIPS

Past studies have documented the problematic relationships between banks and their small business customers. Wynant & Hatch (1990) argue that banks did not have sufficient knowledge or understanding of how small businesses operate and of what their needs are. Clay & Cowling (1996) reveal that lending decisions on small businesses were not based on actual prospects of the business but instead on the likelihood of the banks being collateralized and secured. Banks were seemed much more concerned with how a long would be repaid if the business failed rather than the prospects for success and greater involvement with the small business customers (Lambden & Targett, 1993). However, Wynant & Hatch (1990) assert that banks are in the business of providing low risk financing to small businesses, and sometimes, may find that the purposes sought by the small business owners are not necessarily appropriate for bank financing.

The significant cause of conflict in the bank-small business relationship is the asymmetry of information between the two parties, that is, the small business owner is generally more informed on the financial circumstances and prospects of the business than the bank (Storey, 1994). This situation can give rise to a twin problem of moral hazard and adverse selection. In the former situation, the issue arises where the action of a small business borrower is not directly observable by the banker once he obtains the loan. This borrower may use the borrowed funds for other purposes that may be detrimental to the bank. An adverse selection occurs because the banker cannot distinguish the good risk and the bad risk borrowers (Cowling & Sugden, 1995). A small business owner when approaching the bank for loan has always an advantage over the banker which leads him to overstate the soundness of the business in relation to the funding sought. This explains why some small business ventures, which have high potential for growth and profitability are sometimes turned away by the banks.

The concept of relationship banking has been advocated by some researchers as an effective strategy to overcome the problems in the bank-small business relationships (Madill, Feeney, Riding & Haines, 2002; Blackwell & Winters, 1997; Cole, 1998; Berger & Udell, 1995). It is argued that banks can gain information on their customers over the course of their relationships and then use this information to help in making lending decisions. Information may be gathered over time through a series of loans extended to the small borrower, and the provision and delivery of other financial services. Conditional on this experience, the bank may expect the loans to be less risky, and as a consequence, reduces the interest charged. The customer may not only benefit in terms of lower cost but also in greater access to bank funds due to efficient gathering of information (Berger & Udell, 1998).

Peterson & Rajan (1994) examined the relationship between a small firm and its creditors and how it affects the availability and cost of funds. They found that the length of relationship has a positive and significant effect on the availability of credit to small firms. Likewise, Blackwell & Winters (1997) found a positive relationship between a bank's monitoring effort and the interest rates. Banks would monitor less frequently customers with whom they have closer relationship and ultimately charge them lower interest rates. Bank is also more likely to extend credit or loan to a customer which it has a pre-existing relationship as a source of financial service (Cole, 1998).

The relevance of a borrower's credit in the relationship is also emphasized. The longer the borrower repays his loans, the more likely the business is considered viable, and his trustworthiness. This leads to a building of a good reputation, an increase in the availability of funds, and a relatively lower rate of interest charged on loans. On the other hand, borrowers who default in loan repayments may be denied credit thereafter. Consequently, this leads to an improvement in the quality of small borrowers, and the lowering of lending rates.

The benefits of a good relationship between banks and small business are considerable. From the bank's perspective, as it becomes more knowledgeable about the small business, it will improve its ability to retain the business. This include the potential profit of that business as the customer grows and positive promotion among the small business community. From the small business's perspective, if it can develop closer and stronger bonds with its bank, then it is more assured of financial support even in times of difficulty.

Given the importance of good bank-small business relationships, and given the problems experienced by the two parties, the issue in the Malaysian context is worth exploring further.

METHODOLOGY

The sampling method used in this study was a simple random sample. A total of 150 questionnaires were distributed to the small business owners in the northern region of peninsular Malaysia. However, achieving a representative sample of small business owners in Malaysia is problematic, since appropriate sampling frames do not exist. The questionnaires were handed personally to the owners either in the offices or business premises, and a significant number of questionnaires were left for subsequent completion. The respondents were then asked to return the questionnaire in the self-addressed enveloped provided. A total of 64 useable questionnaires were received, representing a 42.6 percent return rate.

The questionnaire consisted of two parts. The first part included the demographic characteristics of the respondents such as gender, age, years of business, number of employees and types of business ownership. The second part was related to the small business owners' interaction and relationship with the banks. The questionnaire had open questions, classification questions, preference questions and attitude questions. Because of the exploratory nature of the study and the nature of the sample, formal statistical tests were not used. The data analysis is based on frequency distributions and cross-tabulations. Some of the questions could be answered by 'yes' or 'no', and other questions respondents were asked to rate with various indicators, using a 3 point scale from '1' for a poor evaluation to '3' for a good response. Owing to the fact that, a large number of those who responded have 15 or less number of employees, the findings of this study will reflect the views of mainly the micro or smaller business segment of the small businesses in Malaysia.

FINDINGS AND DISCUSSION

CHARACTERISTICS

The profile of respondents and business characteristics are outlined in Table I below.

Table I

1.Gender	Frequency	Percentage
Male	40	62.5
Female	24	37.5
Total	64	100.0
2. Age (years)		
Below 30	9	14.1
30 – 40	20	31.3
41 – 50	22	34.4
Above 50	13	20.3
	64	100.0
3.Business ownership		
Sole proprietorship	33	51.6
Partnership	15	23.4
Limited companies	16	25.0
	64	100.0
4. Age of business (yrs)		
Less than 5	18	28.1
5 – 10	18	28.1
11 – 15	13	20.3
16 –20	9	14.1
More than 20	6	9.4
	64	100.0
5. No. of employees		
Less than 5	42	65.6
5 – 10	15	23.4
11 – 15	4	6.3
More than 15	3	4.7
	64	100.0

Most of the respondents ranged in age from above 40 years with 54.7 percent, between 30 to 40 years with 31.2 percent and below 30 years with 14.1 percent. This shows that the small business owners in this study were of middle age group. In terms of gender, only 37.5 percent of the respondents were female. All the three types of business ownership were represented with the largest number of respondents came from sole-proprietorship (51.6 %), followed by limited companies (25.0 %) and partnership (23.4 %). 65.6 percent of the respondents reported an employee level of less than 5, another 23.4 percent had an employee level of between 5 and 10, and only 4.7 percent had more than 15 employees. About 28.1 percent of the respondents had been in business for less than 5 years, another 48.4 percent ranged from 5 to 15 years, and only 23.5 percent had been running the business for more than 15 years.

SATISFACTION IN BANKING RELATIONSHIP

The respondents were asked to rate their levels of satisfaction on the overall relationship with the banks, the relationships with the bank personnel and the quality of services provided by the banks. Table II below shows that the majority of respondents (70.3%) rated 'good' and above in their overall relationship with the bank. 17.2 of them gave a 'very good' rating. Only 2 respondents or 3.1 percent felt that their banking relationship was poor. However, none gave a 'very poor' rating. On their relationship with the bank personnel, the respondents gave an even higher rating of 'good' and above (73.4%), and only 1.6 percent with a 'poor' rating. The unexpectedly high ratings given by the small business owners to the overall banking relationship contrasted those found in most literature where small business owners, generally, had problematic relationships with their bank.

Table II: Relationship with the Bank

Levels of satisfaction	Frequency	Percentage
Very good	11	17.2
Good	34	53.1
Average	17	26.6
Poor	2	3.1
Very poor	0	0
	64	100.0

Table III: Relationship with the Bank Personnel

Levels of satisfaction	Frequency	Percentage
Very good	8	12.5
Good	39	60.9
Average	16	25.0
Poor	1	1.6
Very poor	0	0
	64	100.0

Respondents were also asked how they would rate the overall quality of service which they receive from their bank. Table IV below shows 12.5 percent of the respondents replied 'very good', 53.1 percent gave 'good' rating and only 6.3 percent believed the quality of service to be poor.

Table IV: Quality of Services provided by Bank

Levels of satisfaction	Frequency	Percentage
Very good	8	12.5
Good	34	53.1
Average	18	28.1
Poor	4	6.3
Very poor	0	0
	64	100.0

IMPORTANT ELEMENTS IN THE BANKING RELATIONSHIP

The respondents were also asked to rate the importance of ten factors in relation to a good banking relationship. The results presented in Table V below show that there was a strong agreement among the respondents with regard to the importance of cost factor and elements of bank service of the banking relationship. Over 68 percent of respondents rated the factor 'bank offers best terms and rates, 64.1 percent rated 'bank handles credit request quickly' and another 59.4 percent of respondents rated 'bank offers a wide range of services' as being 'very important' for a good banking relationship. Surprisingly, a significant percentage of respondents believe that the interpersonal elements of the banking relationship were not of being importance. "Bank manager treats me with respect' (17.2%), 'bank manager makes me feel comfortable'(14.1%), 'bank manager is easy to talk to' (12.5%), and 'bank has specialized personnel'(10.9%) were some of the factors rated as 'not importance'.

Table V

Factor	VI	%	I	%	NI	%
1. Bank knows me and my business	36	56.3	25	39.1	3	4.7
2. Bank provides helpful business advice	32	50.0	27	42.2	5	7.8
3. Bank offers best terms and rates	44	68.8	19	29.7	1	1.6
4. Bank offers a wide range of service	38	59.4	24	37.5	2	3.1
5. Bank handles credit request quickly	41	64.1	21	32.8	2	3.1
6. Banker is easily accessible	34	53.1	29	45.3	1	1.6
7. Bank has specialized personnel	23	35.9	34	53.1	7	10.9
8. Bank manager is easy to talk to	29	45.3	27	42.2	8	12.5
9. Bank manager makes me feel comfortable	27	42.2	28	43.8	9	14.1
10. Bank manager treats me with respect	26	40.6	27	42.2	11	17.2

VI – Very important   I – Important   NI – Not important

The respondents were then asked to rate their bank's performance on the same ten factors of good banking relationship. Table VI below shows that 'bank offers a wide range of service', 'bank knows me and my business', 'banker is easily accessible', 'bank handles credit request quickly' and 'bank offers best terms and rates' had more than 50 percent of 'good' rating. On the other hand, only 'bank provides helpful business advise', 'bank has specialized personnel' and 'bank manager is easy to talk to' are found to have more than 10 percent 'unsatisfactory' rating.

Table VI

No.	Factor	GD	%	AC	%	UN	%
1.	Bank knows me and my business	37	57.8	25	39.1	2	3.1
2.	Bank provides helpful business advice	29	45.3	24	37.5	11	17.2
3.	Bank offers best terms and rates	33	51.6	28	43.8	3	4.7
4.	Bank offers a wide range of service	41	64.1	22	34.4	1	1.6
5.	Bank handles credit request quickly	35	54.7	26	40.6	3	4.7
6.	Banker is easily accessible	36	56.2	25	39.1	3	4.7
7.	Bank has specialized personnel	22	34.4	34	53.1	8	12.5
8.	Bank manager is easy to talk to	30	46.9	27	42.2	7	10.9
9.	Bank manager makes me feel comfortable	32	50.0	27	42.2	5	7.8
10.	Bank manager treats me with respect	34	53.2	25	39.1	5	7.8

GD – Good, AC – Acceptable, UN - Unsatisfactory

Table VII below analyses the respondent's satisfaction with the banking relationship in terms of 'scores' awarded to each factor by each respondent. The banks are found to score well on 'wide range of service', followed by 'knows me and my business', and 'easily accessible'. However, the banks performed less well on 'specialized personnel' and 'helpful business advice'.

Table VII: Bank Performance Scores

Factor	Total	Average
1. Bank knows me and my business	35	0.54
2. Bank provides helpful business advice	18	0.28
3. Bank offers best terms and rates	30	0.46
4. Bank offers a wide range of service	40	0.62
5. Bank handles credit request quickly	32	0.50
6. Banker is easily accessible	33	0.51
7. Bank has specialized personnel	14	0.21
8. Bank manager is easy to talk to	23	0.35
9. Bank manager makes me feel comfortable	27	0.42
10. Bank manager treats me with respect	29	0.45

PROBLEMS IN THE BANKING RELATIONSHIP

The respondents were also asked on the problems they encountered in their banking relationship. Table VIII below shows that the most frequently cited bank related problems were the slow and poor counter service, unhelpful attitude of bank staff, difficulties in getting access to bank loans, high charges for loans and advances, and no 24 hours or ATM services.

Table VIII

	Problem	Frequencies	Percentage
1.	Slow and poor counter service	29	45.30
2.	Unhelpful attitude	16	25.00
3.	Difficulty in obtaining loan	12	18.75
4.	High interest charges	7	10.93
5.	No 24 hours or ATM service	7	10.93

Slow and poor counter service was a major source of problem in the banking relationship, and was mentioned by 45 percent of the respondents. The main complain were that there were often long queues at the counters, insufficient staff to handle the customers, and the longer time taken to handle cases. The second main problem cited was the perceived unhelpful and unfriendly attitudes shown by the bank staff. The complaints were that of staff complacency and arrogance when dealing with customers. These bank staffs were not seemed to be interested in giving customer satisfaction. There was also a feeling among some of the respondents that bankers did not understand them, the needs and the problems of their business. These bankers did not show their interest when approached for loans. Thus, they faced difficulties in getting access to bank loans. Some of the respondents who obtained advances and loans felt that the charges were too high and the terms and conditions imposed on them were unfavourable. The problem cited on the availability of 24 hour and ATM service shows that some small business owners seem to prefer dealing with their bank through Automatic Teller Machines. Therefore to attract more small business customers, banks must provide as many services as possible through the ATMs.

CONCLUSION

The study was conducted to generate an understanding of the nature of bank and small business customer relationships in Malaysia. The findings reveal that there was a relatively high level of satisfaction among small business customers with regard to their bank. The small business customers gave very high 'good and above' ratings on their relationships with the bank, relationships with the bank personnel and quality of services provided by the bank. This shows that, generally, small business customers in Malaysia have high regards in their relationship with the bank. This is in contrast to a number of literature which suggest that most small business owners have a problematical banking relationship.

The findings also reveal that there was a strong agreement among the small business owners on the importance of price competitiveness and speed of bank decisions in the banking relationship. Nevertheless, these two factors were only given marginally high ratings on the performance by their banks. The banks also performed less well on 'specialized personnel' and 'helpful business advise'. These findings should be helpful for the banks to understand further what the customers are looking for and how they evaluate the quality of service. Some issues of concern are highlighted that may make small business customers feel aggrieved with their bank. Poor counter service, unhelpful attitude of bank staff and difficulties in getting access to bank loans are some of the problems encountered by the small business customers in dealing with the bank. Bank should therefore place more emphasis on personnel training so that they can be accurate in tending to the customer needs, quickly response to small business customers, being knowledgeable and appreciative of the small business customer needs.

The ability to develop strong relationships with small business customers has become increasingly important in today's banking environment, and understanding the very real concerns shared by most of these customers will provide a head start in the process of moving towards effective management in the banking relationship. Nevertheless, the findings of this study should be viewed with caution because of the limited generalisability of studies involving small business owners. The study was focused mainly in the northern region of Peninsular Malaysia and the findings may be less valid in some other regions. This should be kept in mind when reviewing the results and may be a direction for future research.

REFERENCES

Barnes, J.G. & Howlett, D.M. (1998). Predictors of equity in relationships between financial services providers and retail customers. *International Journal of Bank Marketing*, 16, 15-23.

Berger, A.N. & Udell, G.F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking and Finance*, 22, 613-673.

Berger, A.N. & Udell, G.F. (1995). Relationship lending and lines of credit in small firm finance, *Journal of Business*, 68(3), 351-381.

Blackwell, D. & Winters, D.B. (1997). Banking relationships and the effect of monitoring on loan pricing. *Journal of Financial Research*, 20, 275-289.

Clay, N. & Cowling, M. (1996). Small firms and bank relationship: A study of cultural differences between English and Scottish banks. *Omega*, 24(1), 115-120.

Cole, R.A. (1998). The importance of relationships to the availability of credit. *Journal of banking and Finance*, 22, 959-977.

Cowling, M. & Sugden, R. (1995). Small firm lending contracts: Do banks differentiate between firms? *Journal of Small Business Finance*, 4(1), 87-98.

Dibb, S. & Meadows, M. (2001). The application of a relationship marketing perspective in retail banking. *The Service Industry Journal*, 21(1), 169.

Dunkelberg, W.C. (1997). How small business views its banking relationships. *Journal of Lending and Credit Risk Management*, 80(2), 14-18.

Kolari, J., Berney, R. & Ou, C. (1997). Study finds small banks profit from small business despite risk. *Journal of Retail Services*, 19(3), 17-24.

Lambden, J. & Targett, D. (1993). *Small business finance: A simple approach*. London: Pitman.

Levitt, T. (1983). 'After the sale is over….'. *Harvard Business Review*, Sept-Oct., 87-93.

Madill, J.J., Feeney, L., Riding, A. & Haines, G.H. (2002). Determinants of SME owners' satisfaction with their banking relationships: a Canadian study. *International Journal of bank Marketing*, 20/2, 86-98.

Main, J. (1982). How banks lure the rich. *Fortune*, Nov., 64-66.

Moriarty, R.T., Kimball, R.C. & Guy, J.H. (1983). The management corporate banking relationships. *Sloan Management Review*, Spring, 3-15.

Peterson, M.A. & Rajan, R.G. (1994). The benefits of firm-creditor relationships: Evidence from small business data. *Journal of Finance*, 49, March, 3-37.

Read, L. (1998). *The financing of small business: A comparative study of male and female business owners*. London: Routledge.

Seybold, P. (2001). *The customer revolution: How to thrive when your customers are in control*. New York: Random House.

Smidec (2002). *SMI Development Plan (2001-2005)*. Kuala Lumpur: SMIDEC.

Storey, D.J. (1994). New firms growth and bank financing. *Small Business Economics*, 6, 139-150.

Storey, D.J. (1982). *Entrepreneurship and the new firm*. London: Croom Helm.

UNIDO (1990). *Small and medium scale industries in Malaysia: The past, the present and the future*. Vienna: United Nation Industrial Development Organization.

Watson, J. & Everett, J. (1993). Defining small business failure. *International Small Business Journal*, 11(3), 35-48.

Wynant, L. & Hatch, J. (1990). Banks and small business borrowers. The Western School. University of Western Ontario.

Capital Structure Choices in Listed Malaysian Firms:
A Recent Relook

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ABSTRACT

This study empirically examines the relationship between capital structure and its traditional determinants (like tangibility, growth opportunities, size, beta) and new determinants like foreign shareholdings and CEO ethnicity. Using data for 205 Malaysian listed Main Board firms for 2001 and 2002, the study concludes that debt financing decision is typically supported by collateral and preferred by big and more risky companies. High growth opportunities and dividend payout firms typically use less debt. More interestingly, Malaysian managers typically shy away from using debt as a means of bonding them to increase efficiency and to discourage themselves from engaging in negative net present value projects. Foreign shareholders though could act as blockholders, are not monitoring the management. However, the finding is only weakly significant. That same conclusion however cannot be extended to companies that are managed by foreign CEOs who tend to prefer more debt in their capital structure. Locally managed companies do not exhibit any conclusive preference for debt although the Chinese CEOs prefer more debt than the Bumiputera CEOs.

INTRODUCTION

Modigliani and Miller (1958) initiated studies in capital structure with their capital structure irrelevance theory. Subsequently, alternative capital structure theories like trade-off theory, pecking order/asymmetric information theory and the agency theory followed. In the developed countries, these theories have been subjected to extensive research in the United States in particular. There have been several studies that examine international comparisons of capital structure determinants (Rajan and Zingales (1995); Wald (1999). However, in developing countries of South-east Asia, there have been few empirical studies on capital structure Pandey, 2001; Ahmad-Zaluki, Abdullah, Abidin, Ali, and Arshad, 2001; Taridi, 1999; Wiwattanakantang, 1999; Setiawan and Taib, 2002; Setiawan, 2004.

The objective of this paper is to investigate whether previous determinants of capital structure still persist and at the same time try to identify whether the ethnicity of the Chief Executive Officer (or Managing Director or Executive Chairman) that is person who makes financing decisions would influence the choice of capital structure in Malaysia. Furthermore, the use of the latest data set covering 2001 and 2002 would provide the latest evidence of capital structure choice especially when the Asian Financial Crisis has already settled.

The remaining sections of the paper are organized as follows: Section two presents a model development on capital structure before a model is proposed. The next section describes the data and research methodology. Section four reports the results of the statistical analyses while section five summarizes the main conclusions of the study.

MODEL DEVELOPMENT

The agency theory supports the use of debt as a means of curbing agency problems and subsequently the reduction of agency costs. Jensen and Meckling (1976) propound that conflicts between shareholders and debtholders results in the occurrence of risk shifting which tends to favour shareholders when risky investments are undertaken (asset substitution). In case, the investment result in profit, the shareholders stand to gain but on the contrary should the investment fail, the debtholders suffer losses. Another finance theory that supports the use of high debt is the tax-shield theory (Modigliani and Miller, 1963). This theory states that profitable firms tend to favour borrowings in order to save taxes as interest charges are tax deductible. Hence, agency theory and tax-shield theories support the use of high debt and predict a positive relationship.

However, if the benefits obtained by debtholders result in a reduction of shareholders returns, shareholders are inclined to reject positive net present value investments. Myers (1977) postulates that to curb this under-investment problem, companies with growth opportunities should not resort to debt financing.

Many variables have been found to be determinants of capital structure. For example, in an international study, Rajan and Zingales (1995) find profitability, size, growth and tangibility (fixed assets divided by total assets) to be significant determinants of capital structure. Other studies have shown that risk and investment opportunities are also important determinants of capital structure for example, Titman and Wessels, 1998; Pandey, Chotigeat, and Ranjit, 2000; Pandey, 2001; Tay, 2001.

The trade-off theory states that tangible assets serve as collateral for borrowing and gives security to lenders in case of financial distress. Jensen and Meckling (1976) argues that collateral help reduce moral hazard problems in shareholder-debtholder conflicts. This suggests that firms that have more tangible assets can be expected to take on more debt. Empirical studies that find a significant positive relationship between asset tangibility and debt are Titman and Wessels, 1988 and Rajan and Zingales, 1995 but Wiwattanakantang, 1999 and Pandey, 2001 find a negative relationship.

Myers (1977) put forth the idea of underinvestment and attributed the problem to shareholder-bondholder conflict. The underinvestment problem arises when firms with investment/growth opportunities but have an overhang of debt which prevents the firm from investing in those valuable projects. Investment opportunities refer to a firm's "assets not yet in place" or its intangible value and because of its nature, there is no collateral. The intangible value will disappear when there is financial distress. Myers (1977) argues that high growth firms may not issue debt as it effectively transfers wealth from shareholders to debtholders. Hence, firms with high growth opportunities (for example, high technology firms) may not issue debt to reduce the agency costs of debt. Myers (1977) posit that firms with high investment/growth opportunities use less long-term debt to reduce moral hazard that is agency problem of underinvestment. Myers (1977) argues that the agency problem may be reduced for short-term debt in contrast to long-term debt that is "shortening debt maturity". The agency theory predict that leverage is negatively related to investment/growth opportunities.

Wealth transfer is another major source of bondholder-shareholder conflict. Smith and Warner (1979) suggested that dividend payment to shareholders is one form of wealth transfer. This is because dividend payout involves the transfer of cash from the firm to the shareholders and as a result, debtholders have less cash available for settling their debt. The other alternative is by issuing debt with the same or higher priority which is not examined in this study due to the lack of data. This study seeks to test whether the wealth transfer problem (via dividends) exist in Malaysia. From the limited literature on wealth transfer, it is interpreted that high dividend payout reflects the presence of wealth transfer. In this case, there will be a positive relation between dividend payout and leverage. If there is a negative relation between dividend payout and leverage, it shows that there is no wealth transfer problems exist. This is due to arguments that suggest that dividend payments and debt act as substitutes in reducing agency costs of debt (Moh'd, Perry and Rimbey, 1998). Empirical findings have so far find a negative relationship between dividend payout and leverage like Jensen, Solberg and Zorn, 1992; Tho, 1994.

Overinvestment is a situation in which managers reinvest excess cash flows in projects with negative net present values. Jensen's (1986) free cash flow hypothesis suggests two conditions (free cash flow or profit and few growth opportunities) in which a firm should have higher debt (or self-imposed debt) to mitigate the overinvestment problem. Unlike the case of Myers' (1977) underinvestment problem which is applicable to firms with growth opportunities, Jensen's overinvestment problem mainly applies to firms with lack of growth opportunities. By increasing debt, managers bond themselves to make regular payments to debtholders and discourage firms from wasting its cash resources in value decreasing investments. This is because debt forces the firm to commit itself to regular cash payments and this reduces the free cash flow available to managers for them to reduce their scope for self-interest activities. Firms with high profit or high cash have a tendency to increase its size ("empire building") even though it results in negative net present value projects. In addition, Grossman and Hart (1982) supports the use of debt finance because it "pressures" managers to increase efficiency and make better investment decisions. The evidence of overinvestment is when there is a positive relationship between free cash flow and leverage. Pandey (2002) use profitability as a proxy for free cash flow.

Size is another important determinant of capital structure. Being more diversified and hence, lower probability of bankruptcy, large firms can be expected to accommodate more debt. However, the empirical evidence is not

conclusive. Studies that detect a positive relationship between debt ratio and size include Rajan and Zingales, 1995; Wiwattanakantang, 1999; Pandey, et al. 2000; Tay, 2001; and Ahmad-Zaluki, et al. 2002. Other studies like Kester (1986) and Johnson and Mitton (2003) find no significant relationship between debt ratio and firm size.

Foreign investors can be regarded as blockholders and they have an incentive to monitor and influence management to protect their significant investments (Mehran, 1992). Shleifer and Vishny (1986) suggest that blockholders (in this case, foreign shareholdings) can reduce the opportunities for managerial opportunism and reduce manager-shareholder conflicts. Foreign or blockholders can act as a substitute for the role of debt to monitor management and reduce agency costs of equity. According to Ferris, Kumar and Sarin (1995, p.324), "blockholders have claims on a large fraction of the firm's cash flows, making it cost effective for them to engage in expensive monitoring of the firm". Usually foreign investors may contribute more to disciplining management by demanding for more information than local investors (Suto, 2001). Hence, if the relationship between foreign investors and debt-equity ratio is positive this would imply that foreign ownership (a control devise) is used as a substitute for debt. On the contrary, if the relationship between foreign investors and debt-equity ratio is negative, this implies that foreign investors do not monitor management. Pound (1988) argue that large shareholders may not be active monitors but instead, they may be passive voters who collude with management.

Haniffa and Cooke (2002) examined the link between Chief Executive Officer (CEO) ethnicity and corporate disclosure. This study seeks to establish a link between CEO ethnicity and capital structure. For Malaysia, the effect of CEO ethnicity is unique because it is a multi-cultural nation and CEOs of local listed firms have come from various ethnicities like Bumiputera, Chinese, Indians and others (foreigners). As a result of their relatively inexperience Bumiputera CEOs may be generally more risk averse than the Chinese or Indian CEOs. Hence, it is possible that Bumiputera CEOs have a tendency to make investment decisions using low debt. If this is the case, there will be a negative relation between Bumiputera CEO and leverage. However, it can be also argued that Bumiputeras being politically more powerful and with their strong political connections are able to get access to more debt from the financial institutions. Hence, in this case, Bumiputera ownership will be positive. The Chinese and the Indian CEOs being longer in business tend to have a longer track record, generally tend to prefer higher risk and as a result may tend to have more debt. In addition, Foreign CEOs (that is non-Malaysian CEOs) may have tendency to use debt as a control debt. As a result of their head office being far away, debt may be used as a control device to keep any deviant actions of their managers in check. Hence, if this is the case, we would expect foreign firms to use more debt. On balance, it is expected that CEO ethnicity has an effect on leverage.

DATA AND METHODOLOGY

In this study, data on all firms listed on Bursa Malaysia (previously Kuala Lumpur Stock Exchange) for the period from 2001 and 2002 were used. Firms in the Finance sector in Malaysia (that is banks, insurance and stock broking firms) are excluded in this study because government regulations imposed on banks, finance companies and stock broking firms result in their capital structure being different and hence non-comparable with non-financial firms. Likewise, many other Asian studies (including Malaysian) on capital structure also exclude non-financial firms are Fan and So (1999), Isa and Kam (2001), and Pandey (2002). Among the other selection criteria for the sample firms are zero sales and negative shareholders' equity. Companies that change their financial year have also been included but their data is annualized. In case, the financial year of samples extend more than 12 months, the data is first annualize the following year data and the substitute the missing data with the mean value.

Model

Briefly, the dependent variable (DE) is the debt-equity ratio and the independent variables consist of eight dimensions of ownership variables, four dimensions of agency costs variables and three control variables. Multiple regression or panel data may be used to test the model.

The multiple regression equation model for this study is as follows:

$$DE_{it} = \alpha_0 + \beta_1 TANG_{it} + \beta_2 Q_{it} + \beta_3 DIV_{it} + \beta_4 FCF_{it} + \beta_5 SIZE_{it} + \beta_6 BETA_{it} + \beta_7 FOREIGN_{it} + \beta_8 CH_{it}$$
$$+ \beta_9 F_{it} + \beta_{10} B_{it} + \varepsilon_{it}$$

Total debt-to-asset ratio (DE) at book value is the dependent variable. Independent variables include tangibility of assets (TANG), growth opportunities (Q), net dividends paid (DIV), firm size (SIZE), unsystematic risk (BETA),

foreign shareholdings (FOREIGN), Chinese Managing Director/Executive Chairman (CH), Foreign Managing Director/Executive Chairman (F) and Bumiputera Managing Director/Executive Chairman.

Total debt-to-asset ratio (DE) is measured by total debts divided by book value of total assets. Tangibility of assets is measured by gross fixed assets minus depreciation and amortization divided by total assets. Tobin's Q (Q) is approximated by as the sum of market value of ordinary shares/equity and book value of long-term debt and net current assets (current assets minus current liabilities) divided by the book value of total assets. This approximation of Q has been used by Chung and Pruitt (1994) owing to the unavailability of replacement costs for fixed assets in Malaysia. Dividends (DIV) is measured by the net amount of dividends paid scaled by total assets. Size (SIZE) is measured as the natural log of total assets. Risk (BETA) is defined as unsystematic risk and is measured by unlevered beta. Beta for each firm is calculated using the adjusted (to take into account capitalization changes) weekly share price data. Foreign shareholdings (FOREIGN) is measured as the percentage of foreign shareholdings divided by total shareholdings.

RESULTS

Table 1 provides the means and standard deviations of the dependent and independent variables. The average total debt ratio (DE) for the period 2001-2002 is 23% and is lower than Pandey (2002) study for 1994-2000. Foreign shareholdings range from 1% to 64% for the sample firms. Data for growth opportunities [Q], Dividend [DIV] and free cash flow [FCD] were standardized to meet the normality assumption. Other than the three variables mentioned, the rest of the data do exhibit the necessary distribution.

Table 1: Descriptive Statistics

	DEBT	TANG	Q	DIV	FCF	SIZE	BETA	FOREIGN
Minimum	0.000	0.001	-3.103	-0.659	-6.216	9.831	-0.544	0.960
Maximum	0.760	0.968	7.675	6.663	10.930	17.850	2.698	64.170
Mean	0.228	0.365	0.000	0.000	0.000	13.628	1.109	15.849
Std. Error	0.009	0.012	0.049	0.049	0.049	0.063	0.030	0.782
Std. Deviation	0.191	0.243	1.000	1.000	1.000	1.267	0.603	15.844
Skewness	0.487	0.405	2.241	2.664	2.722	0.039	0.266	1.507
Std. Error	0.121	0.121	0.121	0.121	0.121	0.121	0.121	0.121
Kurtosis	-0.751	-0.796	12.186	9.983	49.664	0.637	-0.428	1.652
Std. Error	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240
Observations	410	410	410	410	410	410	410	410

Table 2 provides the correlation matrix for the pooled sample firms. We find that size, tangibility and beta have a significant positive relationship with total debt while growth opportunities, dividend, free cash flow and foreign shareholdings have a significant negative relationship. The extent of correlation among the variables is acceptable with no particular variables exhibiting potential for multicollinearity.

Table 2: Correlation Matrix

	DEBT	TANG	Q	DIV	FCF	SIZE	BETA	FOREIGN
DEBT	1							
TANG	.110**	1						
Q	-.401***	-.019	1					
DIV	-.435***	.052	-.435***	1				
FCF	-.147***	-.073	.147***	0.78	1			
SIZE	.207***	.104**	-.186***	.102**	.017	1		
BETA	.342***	-.095	-.266***	-.334***	-.096	.048	1	
FOREIGN	-.190***	.037	.215***	.300***	.040	.096	-.152***	1

Note:*** denotes significance at less than 1% level
        ** denotes significance at less than 5% level

The model was run as specified but the variance inflation factors (VIF) shows extremely high values for the two dummies, CH and M with a value between 22-24. As a result, it is decided that the model be repeated with an

inclusion of each dummy separately. The results of the regression are displayed in Panel A (for CH dummy) and in Panel B (for M dummy) in Table 3.

$$DE_{it} = \alpha_0 + \beta_1 TANG_{it} + \beta_2 Q_{it} + \beta_3 DIV_{it} + \beta_4 FCF_{it} + \beta_5 SIZE_{it} + \beta_6 BETA_{it} + \beta_7 FOREIGN_{it} + \beta_8 Ch_{it} + \beta_9 F_{it} + \beta_{10} Bit + \varepsilon_{it}$$

Total debt-to-asset ratio (DE) is measured by total debts divided by book value of total assets. Tangibility of assets [TANG] is measured by gross fixed assets minus depreciation and amortization divided by total assets. Growth opportunities -Tobin's Q (Q) is approximated by as the sum of market value of ordinary shares/equity and book value of long-term debt and net current assets (current assets minus current liabilities) divided by the book value of total assets. SIZE is measured as the natural log of total assets. Risk is defined as unsystematic risk and is measured by unlevered beta. Beta [BETA] for each firm is calculated using the adjusted (to take into account capitalization changes) weekly share price data. DIV is defined as dividend paid over total fixed assets while FCF is measured by operating profit before taxes plus depreciation and amortisation minus taxes and dividends paid. Foreign shareholdings [FOREIGN] is measured as the percentage of foreign shareholdings divided by total shareholdings. The remaining three variables - CH, F and B are dummy variables that take a value of 1 if they are Chinese [CH], Foreign [F] or Bumiputera [B] Managing Director/Executive Chairman respectively.

Panel A: Results for the model without Bumiputera [B] Dummy
Panel B: Results for the model without Chinese [CH] Dummy

Table 3: Determinants of Capital Structure Choice

Variable	Exp. Sign	PANEL A				PANEL B			
		Coeff.	Std. Error	t-Statistic	Sig.	Coeff.	Std. Error	t-Statistic	Sig.
C		-.292***	.090	-3.232	.001	-.285***	.089	-3.216	.001
TANG	+	.093***	.033	2.848	.005	.092***	.033	2.808	.005
Q	-	-.030***	.009	-3.276	.001	-.030***	.009	-3.298	.001
DIV	-	-.063***	.009	-6.715	.000	-.063***	.009	-6.699	.000
FCF	?	-.014*	.008	-1.765	.078	-.014*	.008	-1.763	.079
SIZE	+	.032***	.007	4.862	.000	.032***	.007	4.838	.000
BETA	+	.055***	.014	3.973	.000	.055***	.014	3.972	.000
FOREIGN	+	-.001*	.001	-1.888	.060	-.001*	.001	-1.815	.070
F	+	.091**	.041	2.210	.028	.084**	.038	2.206	.028
CH/M	+/-	.007	.018	.409	.683	-.002	.018	-.130	.897
					Panel A				Panel B
F Test					23.242***				23.217***
R Squared					34.3%				34.3%
Adjusted R-Squared					32.9%				32.8%
Durbin Watson					1.069				1.067
Std. Error of Model Estimate					.157				.157
Sum Squared Residual					9.82				9.824

Note: *** denotes significance at less than 1% level
       ** denotes significance at less than 5% level

The results for both models are very similar. In Malaysia, the finding for TANG suggests that there is no moral hazard problem in the form of giving out loan without collateral. Companies that have secured loans have sufficient collateral to back their borrowings. Similarly, high growth opportunities companies use less debt to finance their growth. This finding is also in line with the previous studies findings for example, Titman and Wessels, 1988; Lasfer, 1995; Rajan and Zingales, 1995; Pandey, 2002. Similar conclusion emerges from companies with high dividend payout, as they tend to use less debt.

With regard to free cash flow hypothesis as posited by Jensen (1986), a positive relationship is observed if managers choose to get more debts to avoid engaging themselves in projects with negative net present values. However, results from Table 3 seem to suggest otherwise. Managers of Malaysian companies tend to use less debt when they have enough free cash flow in hand although this finding is only weakly significant at less than 10% level. It is not that evident from this finding whether their reluctance to get more debts as monitoring mechanisms is an indication

of engagement in negative net present values projects. It is however, interesting to observe that Malaysian managers are conservative in getting more debts and less proactive in committing themselves to the additional pressure to increase efficiency. Findings by Ahmad-Zaluki et al. (2002) did not find a significant relationship between free cash flow and debt ratio.

SIZE and BETA results follow that of the normal story of being big more access to loan is granted. Another interesting observation that emerges from this study is that the contradictory finding to the preference for debt by foreign investors. As postulated earlier, foreign shareholders are expected to have extra incentives to monitor and influence management in order to protect their significant investment abroad. Results suggest otherwise. Companies that are owned by foreign shareholders typically would shy away from getting on more debts although this is only weakly supported. The finding implies that foreign investors do not monitor management.

With regard to CEO ethnicity, companies that are headed by foreign CEOs apparently would prefer debt as to increase efficiency or ready to be subjected to pressures of using more debt. This finding is statistically significant at less than 5% level. For Chinese (CH) and Bumiputera (M) CEOs although the signs of the coefficient are in the predicted directions, they are not significant; suggesting that they do not have particularly have strong preference for their choice of capital structure.

CONCLUSION

This study empirically examines the relationship between capital structure and its traditional determinants (like tangibility, growth opportunities, size, beta) and new determinants like foreign shareholdings and CEO ethnicity to see their influence on capital structure decisions. Using data for 205 Malaysian listed Main Board firms over a period between 2001 and 2002, the study concludes that debt financing decision is typically supported by collateral and preferred by big and more risky companies. High growth opportunities and dividend payout companies typically use less debt. More interesting observations is made when Malaysian managers typically shy away from using debt as a means of bonding them to increase efficiency and to discourage in engaging themselves in negative net present value projects.

It is equally interesting to note that foreign shareholders though could act as blockholders, are not monitoring the management. However, the finding is only weakly significant. That same conclusion however cannot be extended to companies that are managed by foreign CEOs. These companies tend to prefer more debt in their capital structure probably to be more proactive in meeting the pressures of having to make regular cash payments and limit deviant activities. The locally managed companies do not exhibit any conclusive preference for capital structure although the Chinese CEOs prefer more debt than the Bumiputera CEOs.

The findings reported in this study are necessarily tentative as the data coverage is only over two year period. Nonetheless, it does give some clear pictures the kind of agency problems that Malaysian companies might encounter especially after the full exercise of corporate governance improvements in the post Asian Financial Crisis era.

REFERENCES

Ahmad-Zaluki, N.A., Abdullah, N.A.H., Abidin, S., Ali, H. and Arshad, S.B.M. (2002). *The determinants of capital structure for Malaysian Main Board listed companies during the period 1995-2000*. Paper presented at the 2002 Fourth Annual Malaysian Finance Association Symposium, Penang, Malaysia.

Chung, K.H. and Pruitt, S.W. (1994). A simple approximation of Tobin's Q. *Financial Management*, 23, 70-74.

Fan, D.K.K. and So, R.W. (2000). A survey on capital structure decisions of Hong Kong firms. *Review of Pacific Basin Financial Markets and Policies*, 3, 347-365.

Ferris, S.P., Kumar, R. and Sarin, A. (1995). The role of corporate groupings in controlling agency conflicts: The case of kereitsu. *Pacific-Basin Finance Journal*, 3, 319-335.

Grossman, S.J. and Hart, O. (1982). Corporate finance structure and managerial incentives. In: McCall, J. (ed.), *The economics of information and uncertainty*. University of Chicago Press.

Haniffa, R.M. and Cooke, T.E. (2002). Culture, corporate governance and disclosure in Malaysian corporations. *Abacus*, 38, 317-349.

Isa, M. M. and Kam, J.K. (2001). Capital Structure and Financial Performance Among Listed Malaysian Companies, *Paper presented at Third Malaysian Finance Association Symposium*, 24[th]May 2001, International Islamic University Malaysia, Kuala Lumpur.

Jensen, M.C. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review*, 76, 323-339.

Jensen, M.C. and Meckling, W.H. (1976). Theory of the firm: Managerial behaviour, agency costs, and ownership structure. *Journal of Financial Economics,* 3, 305-360.Johnson S. and Mitton, T. (2003). Cronyism and capital controls: Evidence from Malaysia. *Journal of Financial Economics*, 6, 351-382.

Jensen, G.R., Solberg, D.P. and Zorn, T.S. (1992). Simultaneous determination of insider ownership, debt, and dividend policies. *Journal of Financial and Quantitative Analysis*, 27, 247-263.

Lasfer, M.A.(1995). Agency costs, taxes and debt: The U.K. evidence. *European Financial Management Journal*, 1, 265-285.

Mehran, H. (1992). Executive incentive plans, corporate control and capital structure. *Journal of Financial and Quantitative Analysis*, 27, 575-592.

Modigliani, F. and Miller, M.H. (1958). The cost of capital, corporation finance, and the theory of investment. *American Economic Review*, 48, 261-297.

Moh'd, M.A., Perry, L.G. and Rimbey, J. N. (1998), The impact of ownership structure on corporate debt policy: A Time-Series Cross-Sectional Analysis. *The Financial Review*, 33, 85-98.

Myers, S.C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147-175.

Pandey, I.M. (2001). Capital structure and the firm characteristics: Evidence from an emerging market*, Working Paper No. 2001-10-04*, Indian Institute of Management Ahmedabad, India.

Pandey, I.M. (2002). Capital structure and market power interaction: Evidence from Malaysia, Paper presented at *the Fourth Annual Malaysian Finance Association Symposium 2002, Penang, Malaysia*.

Pandey, I.M., Chotigeat, T. and Ranjit, M.K. (2000). Capital structure choices in an emerging capital market: Case of Thailand. *Management and Change*, 4, 1-14.

Pound, J. (1988). Proxy contests and the efficiency of shareholders oversight. *Journal of Financial Economics*, 20, 237-265.

Rajan, R.G. and Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance,* 50, 1421-1460.

Shleifer, A. and Vishny, R.W. (1986). Large shareholders and corporate control. *Journal of Political Economy*, 94, 461-488.

Setiawan, A.S. and Taib, F.M. (2002). *Joint determination of firm debt, ownership structure on firm's performance: A Methodological review*. Paper presented at the 2002 Fourth Annual Malaysian Finance Association Symposium, Penang, Malaysia.

Setiawan, A.S. (2004). An empirical analysis of debt-equity choice in Indonesian companies. Unpublished Ph.D. thesis, Universiti Sains Malaysia.

Smith, C.W. Jr. and Warner, J.B. (1979). On financial contracting: An analysis of bond covenants. *Journal of Financial Economics*, 7, 117-161.

Suto, M. (2001). Capital structure and investment behaviour of Malaysian firms in the 1990s – A study of corporate governance before the crisis. *Center for Economic Institutions Working Paper No. 2001-9*.

Taridi (1999). Corporate governance, ownership concentration and its impact on firms' performance and firms' debt in listed companies in Indonesia. *The Indonesian Quarterly*, 27, 339-355.

Tay, C.S. (2001). Capital structure behaviour: A study of listed companies in Malaysia. Unpublished *MBA Research Project*, Universiti Sains Malaysia.

Titman, S. and Wessels, R. (1988). The determinants of capital structure choice. *Journal of Finance*, 53, 1-19.

Tho, L.M. Susan (1994). The determinants of corporate financial structure: The Malaysian evidence. *Securities Industry Review*, 20, 79-86.

Wiwattanakantang, Y. (1999). An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal*, 7, 391-403.

International Business Operators' Decision Criteria in Selecting Banks

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ABSTRACT

Bank selection is not an easy task especially when you are running a business in the era of globalization. A lot of marketing research in the past 10 to 15 years has attempted to identify the banking needs of both small and large business customers. Schlesinger, Unsal and Zaman (1987) found that the three most important factors in selecting a bank were lending rates, accessibility of borrowing and the number of services offered. The research aimed to identify the main criteria international business operators look for in selecting banks. In this context, international business operators were only limited to forwarding and shipping agents in Klang Port, Selangor, Malaysia. Questionnaire surveys and interview sessions were undertaken to collect data from the forwarding and shipping agents listed in the E-Directory of the Federation of Malaysian Manufacturers (FMM). The respondents were also asked to rank the criteria that they thought was the most important in selecting banks. Data then were analyzed using Descriptive Statistical Analysis. Findings indicated that the most important criterion that international business operators look for in selecting banks was safety of funds and confidence. The least important criterion was effective advertising. Hopefully, this research could help the banking organizations to provide better banking services to the respondents in the future.

INTRODUCTION

The banking environment is changing more rapidly than before. It is characterized by intensifying competition from both domestic and foreign companies, a spate of mergers and acquisitions and more sophisticated and demanding customers who have greater expectations related to their experiences (Smith, 1989). Consequently, banks today must differentiate their organizations by meeting the needs of their customers better than the competition. Rapid environmental changes will necessitate continued attention and emphasis in formulating bank marketing strategies on the part of management.

In its true sense, bank marketing involves a commitment on the part of management to adopt a consumer-oriented approach as their philosophy of doing business (Ta, H.P., Har, K.Y., 2000). Eli Lenyoun, vice-president of financial planning at the United Overseas Bank (UOB) Singapore commented that an essential first step in bank marketing is to ensure that its services correspond with a client's short and long term needs. He also stressed the importance of developing an early banking relationship with a client because "bankers are looking for opportunities to have relationships with people who are going to develop. They want to be there when you develop because the more banking services you use, the more profitable the relationship with that particular customer" (*Asia Magazine*, 1996).

Regardless whether they are individual or corporate customers, bank customers nowadays are more 'picky' in choosing financial or banking service providers. In addition, bank customers are more concerned with other factors like the environment of the establishment, satisfaction, reliability of bank personnel and the 'feel good' factor that makes them stay loyal to a certain bank or several banks; regardless whether it is foreign-originated or local banks. The fact of the matter is, banks need to determine what are the factors deemed important to their customers in order to be more competitive. Only then, might it be possible for them to tailor-made their banking services to all their business or corporate customers. Thus, this study aimed to identify the criteria international business operators look for in deciding which banks to patronize. Hopefully, the findings from this study could shed some light on the criteria that should be present in a bank to entice international business operators to choose that particular bank as their first preference.

PROBLEM STATEMENT

Providing banking services to business clients is no easy task. Business customers want to have banks that they can rely on because constant delays in banking procedures and other 'red-tapes' will eventually disrupt the

smooth operations of their daily activities. This research focused on international business operators or sometimes referred to as logistics service providers (LSPs) who normally does all the logistics related activities such as transportation of goods, provision of warehouse facilities, inventory management, order processing management and packaging. Due to the nature of the industry that involves cross-border activities, these international business operators need to rely on banking institutions for invoicing, freight bill payments, factoring, audit and insurance services. Naturally, they want the chosen banking institutions to provide them with relevant and efficient banking services to avoid glitches in their daily operations.

RESEARCH QUESTIONS
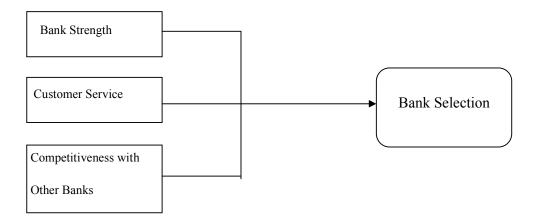
This study attempted to answer the following research questions:
- What are the main criteria international business operators look for in selecting banks?
- Which dimension of a bank deemed most important to international business operators?
- Which is the most preferred bank used by international business operators?

THEORETICAL FRAMEWORK

In the following theoretical framework, the dependent variable is bank selection while the independent variables are bank strength, customer service and competitiveness with other banks. A positive relationship can be expected between the three independent variables and bank selection. According to a study by Edris *et al*. (1997), there was indeed positive relationships between size of banks assets (bank strength), efficiency of personnel (customer service) and fees / interest on loans (competitiveness with other banks).

Figure 1: Theoretical Framework

Pilot Study

Before the actual distribution of questionnaires, a pilot study was conducted with the selection of five respondents who are international business operators in Klang Port. This was to establish reliability and validity of the questionnaires and was pertinent to further improve the questionnaires and avoid any confusion on the part of respondents before the actual distribution took place. In addition, this pilot study was relevant so that the feedback given by the respondents was reliable for the research. The responses from the pilot study were then collected and analyzed and the results from the reliability testing is illustrated below:

Table 1: Reliability Testing

DIMENSION	CRONBACH ALPHA
1.Bank strength	0.740
2.Customer service	0.779
3.Products and services offered	0.325
4.Competitiveness with other banks	0.671

Based on Table 1, three dimensions (1, 2 and 4) recorded an Alpha of more than 0.60, which indicated that these dimensions were accepted for further analysis. The third dimension, products and services offered had an Alpha of less than 0.60, which indicated that the items under this dimension do not really measure what it should be measuring and thus was omitted.

LITERATURE REVIEW

This industry has changed since the mid-1980s in the form of increasing competition in the marketplace, growing financial awareness by customers, economic pressures on traditional markets and government legislation. These changes have contributed in making the market for retail financial services more open (Davis, 1994). Birch (1995) warns that "Fierce competition will lead to fewer financial service organizations ... smaller banks will merge with larger ones, and many may disappear altogether". Ellwood (1994) suggests that: in the year 2000, the customer will see a banking marketplace where the blurring of identity between banks, insurance companies, and of other possible competitors that will enter in the market, will have accelerated... Customers will shop around more than ever and profitability will come under pressure. The result of this "shopping around" culture will be a higher mobility among customers buying financial products. Differentiation will continue to lead the marketing strategy of banks, but it will be centered neither on products, as they are about the same, nor on price, as price differentials are minimal. Therefore, how will a financial institution, such as a retail bank, compete in such an environment? How will it differentiate its offerings from those of its competitors (Birch, 1995; BMA, 1991)?

Financial institutions are acknowledging that unless customer needs are taken into account in designing and delivering services, technical superiority will not bring success (Zeithaml and Bitner, 1996). New marketing concepts and strategies (Ennew *et al*., 1993) are paying greater attention to identifying customer needs and expectations (Morgan, 1989) and offering high levels of service quality (Lewis, 1991; 1993; Thwaites and Vere, 1995). As argued in the literature (Brown and Swartz, 1989; Buzzel and Gale, 1987; Edvardsson *et al*., 1994; Grönroos, 1990; Lewis, 1989; 1991; Lewis *et al*., 1994; Parasuraman *et al*., 1988; 1991; Zeithaml and Bitner, 1996; Zeithaml *et al*., 1990), it is probably the effective measurement, management and improvement of service quality which will enable financial institutions to achieve a differential advantage over their competitors (Lewis, 1989; 1991).

The literature of bank marketing shows that little attention has been paid by researchers to business customers (sometimes called corporate customers). One early study was undertaken by Kaufman (1967) to determine the important criteria judged by retail and corporate customers influencing their selection and patronization of specific banks. The study found that the majority of the sampled respondents selecting the most convenient bank to their home, place of business, or both. Other few studies were conducted among corporate customers in Hong Kong to explore their banking behaviour and bank selection decisions (Chan and Ma, 1987, 1990; Kong and So, 1981). One study by Edris (1997) highlighted the determinant factors a bank in Kuwait by business firms. The ranking were size of bank assets (1), efficiency of personnel (2), help in financial emergencies (3), banking experience (4), friendliness of staff (5), reputation (6), communications with staff (7), knowledge of firm's business (8), prompt provision of services (9), and availability of branches abroad (10). The lowest-ranking determinant factors, on the other hand, were: effective advertising (27), interests on deposits (26), lending policy (25), Islamic banking practices (24), attractiveness of branches (23), parking areas and facilities (22), hours of operation (21), Kuwaiti ownership (20), fees/interest charges on loans (19), and convenience of location (18).

METHODOLGY

In general, this research attempts to determine the main criteria international business operators look for when deciding which banks to patronize. The research was conducted closely in accordance to similar researches in bank selection put forth by Edris, T.A. (1997), Nielsen,Terry and Trayler (1998) and Haron,Ahmad and Planisek (1994). The research was conducted using survey approach that consisted of multiple-choice questionnaires requiring respondents to give fixed responses to the statements or questions asked. The sources of the research

data were a combination of both primary and secondary data. The primary data for this research were gathered through the distribution of questionnaires to selected international business operators; namely logistics service providers, forwarding agents and other operators of the same nature in Klang Port, Selangor, Malaysia. The list of international business operators located in Klang Port, Selangor was obtained from the Federation of Malaysian Manufacturers (FMM) e-directory. A questionnaire was replicated from the earlier researches done by Edris, T.A. (1997), Nielsen,Terry and Trayler (1998) and Haron, Ahmad and Planisek (1994).

The population for determining the main criteria for bank selection among international business operators was every international business operators in the vicinity of Klang Port, Selangor, Malaysia. Due to time and resource constraints, nonprobability sampling method, more specifically, convenience sampling was applied for this research. The researcher conducted convenience sampling method by randomly selecting international business operators listed in the e-directory of international business operators. According to Sekaran (2000), if the population of a study is about 270, the sample is equivalent to 159. However, in this study, the researcher has distributed 170 questionnaires to international business operators located in Port Klang, Selangor listed in the Malaysian Manufacturers e-directory. Out of the 170 questionnaires distributed, 52 were returned back to the sender and 4 of the returned questionnaires were incomplete leaving the researcher with only 48 valid responses. According to Roscoe (1975), sample sizes larger than 30 and less than 500 are appropriate for most research thus this research was carried out although the response rate was quite low. Descriptive Statistical Technique was used to show the variables in terms of their frequency, percentages, standard deviation and mean. It was applied to analyze all the statements and questions from Section A and Section B of the questionnaire to draw statistical conclusions from the responses. The descriptive analysis techniques were used to answer research questions 1, 2 and 3.

FINDINGS AND ANALYSIS

Out of the 48 respondents, 14 were forwarding agents, 14 others were logistics companies and another 14 were logistics companies. This constitutes 87.6% of the total respondents. 79.2% of the respondents were local companies and the majority of them were wholly owned companies (87.5%). More than one third of the companies (37.5%) had employees between 1 to 30 workers and 31.3% of them had the most number of employees (more than 120). From the 48 responses received, 68.8% of the respondents had business dealings around Asia while only one served the Middle East markets. More than half of the total respondents (58.3%) were in their 6th to 15th year in business. 60.4% of the respondents used two banks while 31.3% used 3 banks in their daily operations. 70.8% of the respondents indicated that they preferred banks of local origin.

Table 2: Means and Standard Deviations for Dimension 1

Variables	Mean	Std.Deviation
Bank Strength	**4.26**	**0.343**
Bank's reputation	4.44	0.501
Innovative services	4.42	0.498
Reliability of personnel / staff	4.35	0.483
Knowledge of firm's business	4.31	0.511
Banking expertise	4.27	0.676
Size of bank's assets	4.25	0.565
Origin of bank (Local / Foreign banks)	4.08	0.647
Availability of branches abroad	3.98	0.758

The table above indicated that all the variables under the bank strength dimension showed a favorable mean which showed that these variables were important as criteria for them to choose the preferred banks. Almost all variable had a mean of more than 4 with the exception of the variable 'availability of branches abroad'.

Table 3: Means and Standard Deviations for Dimension 2

Variables	Mean	Std.Deviation
Customer Service	**4.17**	**0.330**
Safety of funds and confidence	4.69	0.468
Efficiency in correcting mistakes	4.63	0.489
Speed of service and decision making	4.48	0.505
Efficiency of personnel / staff	4.33	0.519
Friendliness of personnel / staff	4.27	0.610
Operating hours	4.27	0.610
Ample nearby parking facilities	4.21	0.544
Convenience of location	4.19	0.445
Prompt services	4.10	0.805
E-banking / Online banking	4.00	0.743
Attractiveness of branches	3.67	0.996
Effective advertising	3.25	0.601

Under the customer service dimension, the majority of the variables recorded a response of 4 and above which indicated that variables under this dimension were important in selecting banks. The highest mean recorded was for the variable ' safety of funds and confidence'. Two variables, effective advertising and attractiveness of branches had means of 3.25 and 3.67 respectively.

Table 4: Means and Standard Deviations for Dimension 3

Variables	Mean	Std.Deviation
Competitiveness with other banks	**4.15**	**0.550**
Flexibility in loan negotiations	4.44	0.542
Lending policy	4.21	0.713
Interest on deposits	4.04	0.824
Fee / interest charged on loans	3.92	0.942

For the third dimension, all except one variable had means of more than 4. This indicated that the variables under this dimension were important in bank selection. However, the variable 'fees/ interest charged on loans' recorded a mean of 3.92, which pointed out that the respondents were unsure whether this variable is important, or not to depict the competitiveness of a bank with other banks.

Table 5: Ranking of Variables

Variables	Mean	Ranking
Safety of funds and confidence	4.69	1
Efficiency in correcting mistakes	4.63	2
Speed of service and decision making	4.48	3
Flexibility in loan negotiations	4.44	4
Bank's reputation	4.44	4
Innovative services	4.42	6
Reliability of personnel / staff	4.35	7
Efficiency of personnel / staff	4.33	8
Knowledge of firm's business	4.31	9
Friendliness of personnel / staff	4.27	10
Operating hours	4.27	10
Banking expertise	4.27	10
Size of bank's assets	4.25	13
Ample nearby parking facilities	4.21	14
Lending policy	4.21	14
Convenience of location	4.19	16
Prompt services	4.10	17
Origin of bank (Local / Foreign banks)	4.08	18
Interest on deposits	4.04	19
E-banking / Online banking	4.00	20
Availability of branches abroad	3.98	21
Fees / interest charged on loans	3.92	22
Attractiveness of branches	3.67	23
Effective advertising	3.25	24

From Table 5, the variables with the highest mean were safety of funds and confidence, followed by efficiency in correcting mistakes and speed of service and decision making. This showed that in selecting which banks to patronize, international business operators rank safety of funds and confidence as the most important criteria that a bank should have. This indicated that the element of trust was very important to entice would-be customers to patron specific banks. Surprisingly enough, attractiveness of branches and effective advertising were the variables with lower means. This showed that customers would not choose a bank based solely on exterior factors and aggressive promotional activities.

Table 6: Ranking of Banks

Name of Bank	Frequency	Percentage (%)	Origin (L/F) *	Ranking
Maybank	23	47.9	L	1
Standard Chartered	14	29.2	F	2
HSBC	14	29.2	F	2
Affin Bank	12	25	L	4
AmBank	11	22.9	L	5
RHB Bank	11	22.9	L	5
BCB	10	20.8	L	7
EON Bank	10	20.8	L	7
Southern Bank	4	8.3	L	9
Alliance Bank	2	4.2	L	10
Citibank	2	4.2	F	10
UOB	2	4.2	F	10
Bangkok Bank	1	2.1	F	13
Hong Leong Bank	1	2.1	L	13
Public Bank	1	2.1	L	13

Note: * L = Local , F = Foreign

Table 6 lists all the banks that the respondents used and their rankings. Maybank, a local bank was the most preferred bank among the international business operators. It garnered 47.9% votes, which indicated that almost half of the respondents used Maybank in their business operations. The second and third spots went to foreign originated banks, Standard Chartered and HSBC. The two banks that were least preferred by the respondents were Hong Leong and Public Bank. This was apparent from the responses collected whereby only one response was gathered for each bank. Two banks, namely Bank of China and Bank of America, both foreign-originated banks were not preferred by any of the respondents.

DISCUSSIONS

Due to the competitive nature of the banking industry, it is imperative that banking institutions pay closer attention to what the customers really want. Thus, knowing the criteria customers, in this case, international business operators look for in a bank is critical to maintain a healthy relationship between both parties. From the findings, it is concluded that the most important criteria international business operators look for in a bank is safety of funds and confidence. No doubt the element of trust should be present in order for a business customer to patronize specific banks. This criterion is followed by the second highest ranking criterion namely efficiency in correcting mistakes, which brought us to the conclusion that customers want any errors to be corrected promptly as to not loose precious business time. The third important criterion in bank selection identified was the speed of service and decision making. It can be inferred here that the underlying reason for the importance of this criterion is that customers do not want their smooth-sailing business operations to be disrupted by glitches in terms of banking services. These hiccups will eventually affect the relationship between both parties and might be an underlying excuse to change provider. On the other hand, the bottom three least important criteria identified were effective advertising, attractiveness of branches and fees / interest charged on loans. This implied that promotional efforts, decorative factors and competitiveness with other providers were unimportant in bank selection. Comparing the means for all three dimensions, it is concluded that the first dimension, bank strength had the highest mean (4.26). Therefore, this possibly showed that almost all the variables under this dimension were important in bank selection. In addition, possibly, a bank's strength was the most important factor that distinguishes one bank from the other.

Tapping further into the identified criteria international business operators look for in selecting banks, I am of the opinion that since these companies' daily operations normally involves a lot of cross-border activities and delivery of goods to most parts of the world, it is highly relevant for them to put confidence and trust as the key elements in selecting banks. To them, these banks will act as middlemen for giving and receiving funds and relevant documents, such as Letter of Credits to and from other banks and from their clients. Therefore, it is

highly important for these operators to have confidence in their chosen banks. Furthermore, when dealing in a business environment where timing is everything, you need to find banks, which can deliver what they promise as and when needed. Any glitches will result in extra cost such as paying for demurrage; which is charges paid to the port for goods / vessel that are not unloaded within the specified time frame and paying extra for storage for goods which are not released promptly. It gets worse if the operators are dealing with perishable goods like foodstuff. When compared with a similar study by Edris (1997), the top three identified criteria deemed important among business customers were size of banks assets, efficiency of personnel and help in financial emergencies. Meanwhile, the lowest ranking determinants identified by Edris (1997) were effective advertising, interest on deposits and lending policy. Although the findings have more dissimilarities than similarities, one criterion remained the same. It showed that effective advertising were ranked the lowest in both studies. Comparing with another similar study by Nielsen *et al.* (1998), the most important criterion in selecting banks was the willingness of the bank to accommodate the customers' credit needs, followed by the efficiency of bank's daily operations and bank's knowledge of the company's business.

LIMITATIONS

There were several limitations to this study, which should be noted. First, given that the sample comprised of international business operators in Port Klang, Selangor, the results may not be generalize to other populations. Second, there is an imbalance in terms of local and foreign companies as respondents, which suggest that, further investigations for other relevant factors to be included in future researches. This imbalance would probably lead to 'Country-of-Origin' biasness. Third, since the Federation of Malaysian Manufacturers (FMM) e-directory did not indicate whether the company was actually the head office or only the branch, this might have an impact to the responses given because normally the head office will handle the selection of banks.

CONCLUSION

Hopefully , this study has managed to answer all its objectives and contributed some input to the body of the relevant literature. As a conclusion, the most important criteria international business operators in Port Klang, Selangor look for in a bank is the safety of funds and confidence. The least important criteria in bank selection is effective advertising. The most important dimension in bank selection is the bank strength factors. The most preferred bank is Maybank, followed by Standard Chartered and HSBC. It is recommended that a comparative study be conducted to determine the services considered important to business customers and compare the rankings of important services among different types of businesses. The business firms could be categorized according to nature of business, origin, size and so forth. Another area that could be further studied is on the intention, attitudes and social influence in bank selection in a specific culture.

REFERENCES

Asia Magazine, (1996). *Banking on it*. 18.
Birch, P., (1995). *Adapting to change*. Banking World, January, 29.
BMA – Bank Marketing Association (an affiliate of American Bankers Association), (1991). *Quality Focus - How to Conduct Service Quality Research*, 1.
Brown, S.W., Swartz, T.A. (1989). A gap of analysis of professional service quality. *Journal of Marketing*, 53, April, 92-8.
Buzzell, R.D., Gale, B.T. (1987). *The PIMS Principles : Linking Strategy to Performance*. The Free Press, New York, NY.
Chan. A.K., Ma, V.M.(1987). Hong Kong companies attitudes towards banking and financial services: a survey approach in the manufacturing sector. *The Hong Kong Manager*, 23,5,17-30.
Davis,B., (1994). Change is only constant. *Banking World*, January, 21.
Edris, T.A. (1997). Services considered important to business customers and determinants of bank selection in Kuwait: a segmentation analysis. *International Journal of Bank Market*ing, 15,4,126-133.
Edvardsson, B., Thomasson, B., Ovretveit, J. (1994). *Quality of Service*. Barrie Dale, London.
Ellwood, P., (1994). Thriving through service. *Banking World*, January, 20.
Ennew, C.T., Wright, M., Thwaites, D.(1993). Strategic marketing in financial services: retrospect and prospect. *International Journal of Bank Marketing*, 11,6, 12–18.

Federation of Malaysian Manufacturer (FMM) e-directory.

Gronroos, C. (1990). *Service Management and Marketing*. Lexington Books, Lexington, MA.

Haron, S., Ahmad, N., Planisek, S.L. (1994). Bank Patronage Factors of Muslim and Non-Muslim Customers. *International Journal of Bank Marketing*, 12,1,32-40.

Kaufman, G.G. (1967). Business firms and households view commercial banks: a survey. *Report to the Federal Research Bank of Chicago*, Chicago, Federal Reserve Bank.

Kong, S.M., So, K.H. (1981*)*. A study of the bank selection criteria among multinational corporations in Hong Kong. *International Journal of Bank Marketing*. Unpublished MBA thesis.

Lewis, B.R.,(1991), Service quality : an international comparison of bank customers; expectations and perception. *Journal of Marketing Management*, 7,47-62.

Morgan, N.A.(1989). Developing information strategies in the financial services sector. *Marketing Intelligence and Planning*, 7,7,24-8.

Nielsen, J.F., Terry, C., Trayler, R.M. (1998). Business banking in Australia; a comparison of expectations. *International Journal of Bank Marketing*, 16,6,253-263.

Parasuraman, A., Zeithaml, V.A., Berry, L.L. (1988). *SERVQUAL :* a multiple-item scale for measuring customer perceptions of service quality. *Journal of Retailing*, 64,12-40.

Prince, R.A., Schultz, A. (1990). Factors that attract small business. *Bank Marketing*, 22,28-30.

Roscoe, J.T. (1975). *Fundamental research statistics for the behavioral science (2nd Ed.)*. New York : Holt, Rinehart and Winston.

Schlesinger, W.D., Unsal, F., Zaman, M.R. (1987). Attributes of sound banking as perceived by small business: results of a survey. *Journal of Small Business Management*, 25, 47-53.

Sekaran, U. (2000). *Research Methods for Business (3rd Ed.)*. New York ; John Wiley and Sons.

Smith,A.M, (1989). Service quality: relations between banks and their small business clients. *International Journal of Bank Marketing*, 7,5,28-36.

Ta, H.P., Har, K.Y., (2000). A study of bank selection decisions in Singapore using the Analytical Hierarchy Process**.** *International Journal of Bank Marketing*, 18,4,170-180.

Thwaites, D.,Vere, L.,(1995). Bank selection criteria – student perspective*. Journal of Marketing Management*, 11,133-49.

Zeithaml, V.A., Bitner, J.M., (1996). *Services Marketing*. McGraw-Hill, New York, NY.

Zeithaml, V.A., Parasuraman, A., Berry, L.L. (1990). *Delivering Quality Service – Balancing Customer Perceptions and Expectations*. The Free Press, New York, NY.

Pragmatic Fuzzy Logic Design Approach For Project Rating

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Abstract
For many years, Profitability Index (PI) has been used extensively for the calculation of project return. Payback has a different implication in the performance appraisal world where it deals with the calculation of a duration required for a particular investment return. This paper presents an artificial decision-making tool, which is the fuzzy logic (FL) design. This is to link traditional variables of PI and payback. The usage of an engineering tool, LabVIEW FL toolkit in this work, integrates the two input variables, namely PI and Payback Period (PP) and generates an output. The associated output is the rating consideration for project investment. This method may reveal different degree in rating projects. FL concept will be discussed and the implementation will be shown graphically in this work.

INTRODUCTION

PI (Pike, 2003) indicates the ratio of the present value of benefits to cost, which takes into account the present value and capital investment into mathematical calculations. PI is evaluated in such a way, where a project's present value is divided by the capital invested. Greater value of this index is preferred. Payback is a project appraisal technique, which indicates the time period require to regain the initial capital invested in a project. When the yearly-accumulated return from the project is equal to the capital invested, the payback can be realized.

PI and payback are two different appraisal methods, which have different implications in terms of project return and project PP. To deal with sources of vagueness and imprecision, fuzzy theory may be employed as a useful tool for handling such conditions. Fuzzy uncertainty can have an effect on important decision (Jablonowski, 2000). Fuzziness can be found in many areas; particularly frequent in areas in which human judgment, evaluation and decision are important, as these are in investment selection projects (Isabel, 1989, P150).

Consider these two scenarios, firstly, a project that has a high PI ratio with a long PP, secondly, another project B that has a low PI ratio with short PP. What would be a better decision that a company would prefer in relation to the importance of PI and PP. Especially to determine the project rating precisely in wording of how "Good" or how "Bad" would then turn out to be "ambiguous". Fuzzy set theory enables a soft classification approach to account for uncertainties (Aydin, 2004). Project Rating (PR) can be used to illustrate the weighting of these variables. To rate a project, FL would be applied to generate the output based on the important analysis of the two input variables; PI and PP.

PI AND PP DESIGN

Bellman and Zadeh defined a decision set, which unifies a fuzzy objective (i.e. a fuzzy goal) and a fuzzy constraint given by a decision maker (Yuji, 2001). In this paper, PI and PP are denoted as two input variables and the project rating will be the output variable. In all fuzzy designs, fuzzification, inference process and defuzzification are three important stages.
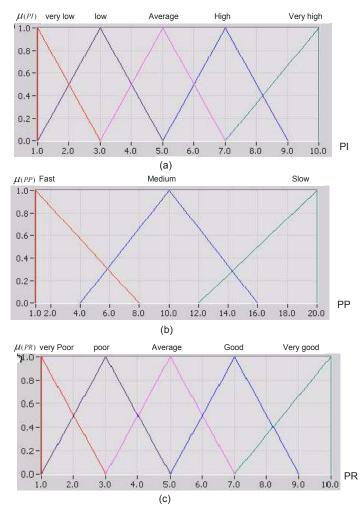
Figure1: (a) - (b) show The Membership Functions Of Two Input Variables and (c) shows The Membership Function Of The Output Variable PR.

In the first step of fuzzification, membership function (MF) can be linguistically explained by individual sets such as very low, low, average, high and very high in figure 1. The linguistic term can be manipulated with fuzzy set theory and they can be interpreted as specific fuzzy number that allows us to perform the tradeoff analysis among various criteria [Juite, 2002]. All terms are assigned with membership degree in the range from 0 to 1. The PI is set within a range from 1 to 10 and PP has a range from 1 to 20 years. A project with 18 years PP would fall into 'slow' in the linguistic term as shown in figure 1(b). The crisp value of 4 in PI would be classified under fuzzy sets as slightly 'low' and slightly 'average'.

Table 1: Rating Rules Based For Projects

Rules	PI	PP	PR
1	Very low	Fast	Average
2	Very low	Medium	Poor
3	Very low	Slow	Very poor
4	Low	Fast	Average
5	Low	Medium	Poor
6	Low	Slow	Poor
7	Average	Fast	Good
8	Average	Medium	Average
9	Average	Slow	Poor
10	High	Fast	Very good
11	High	Medium	Good
12	High	Slow	Average
13	Very high	Fast	Very good
14	Very high	Medium	Good
15	Very high	Slow	Average

After two linguistic variables have been clearly defined, inference processing would be the next stage. The decision on the PR are highly dependence on the 'IF and THEN' rules. Table 1 shows the detailed rule-based, which is used for inference process. Output linguistic terms have individual sets defined as the following: very poor, poor, average, good and very good. For example, in rule 1: if PI is very low and PP is very fast, then, PR will be average etc. The rule-based formulation depends on human expertise and experience about this subject matter. If the project PI is 'High' and the PP is 'Slow', the project will be classified as 'Average'.

Project Evaluation Process

Defuzzification is the final stage of the entire fuzzy process. Figure 2 shows the linguistic terms that consist of 'very poor, poor, average, good and very good'. Under diverse combinations of PI and PP as crisp input values to fuzzy process, this would yield the different output crisp value after defuzzification. When a project has PI 5.5 and PP 13 years, the crisp output could be computed using mathematic equation, which is the stage of defuzzification.
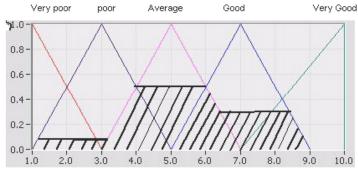
Figure 2: Centre Area For Completed Project Rating Output

Shaded area in figure 3 shows the output of PR, when PI and PP is 5.5 and 13 respectively. To get crisp output value, it is necessary to calculate the aggregated average output as follows:

$$PR = \frac{0.5(5) + 0.3(7) + 0.1(3)}{0.5 + 0.3 + 0.1} = 5.44$$

PR is rated from minimum of 1 to a maximum of 10. The output, which yields a higher value, would be preferable. The result of 5.44 is considered an average project. Advance engineering software tool, LabVIEW and FL toolkit were utilized to assist in automating the calculation and fuzzy process for obtaining output values through these iterative procedures.

3-D Representation For Project Investment Assessment

A three dimensional representation of project ranking (i.e. as a single output) versus payback period and profitability index is shown in the following figure 3. LabVIEW and Fuzzy Logic controller design toolkit were utilized to perform the entire fuzzification, inference and defuzzification processes. The data analysis and presentation is performed with this powerful graphical user-friendly software, which is widely used in engineering and science disciplines.
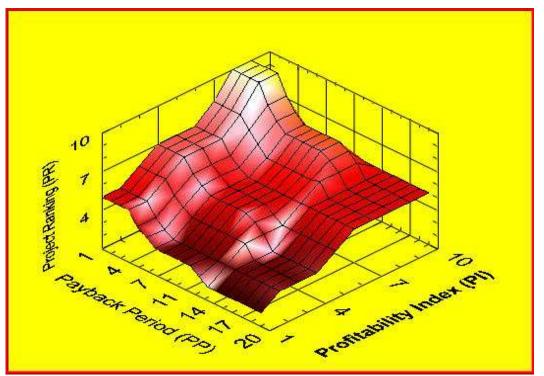
Figure 3: 3D Surface Plot Showing The Dependency Of The PI And PP And The Output Variable PR

A 3D surface plot is obtained and it shows the dependency of two inputs variable and the output variable. It shows the result of how individual variable will affect the crisp output value. A combination of high PI value and a low PP value, when input into this particular fuzzy logic design, will result and display peaks in this graphical output. This particular type of representation of 3D surface plot is useful, with clear visibility for investors considering project investment rating.

CONCLUSION

In this study, a Fuzzy Logic tool was utilized to investigate the evaluation of projects based on two linguistic input variables namely, profitability index and payback period. Evaluation and decision-making based on project rating would be easy using this approach. In evaluating project investment rating, the effort may be arduous in handling

substantially huge amount of different combinational values from different input variables. The use of FL could ease this complexity and data representation. The capability of FL is not limited to 2 variables only. In principle, this intelligent decision making tool is scalable to multi-input variables, especially for a complex project investment that has multiple input variables rating consideration. In conclusion, this paper presents a useful tool utilizing an artificial decision-making tool, the LabVIEW Fuzzy logic design for the purpose of project investment rating.

REFERENCES

Aydin A, Fuzzy Set Approaches to classification of rock masses, ARTICLE Engineering Geology, In Press, Corrected Proof, 2004

Isabel G, Fuzzy Numbers and Net Present Value, Scandinavian Journal of Management, Vol. 5, Issue 2, 1989, Pages 149-159

Yuji Y, Dynamical Aspects in Fuzzy Decision Making, *Physica-Verlag Heidelberg New York*, 2001, Page 146

R Pike and B Neale, Corporate Finance and Investment, Prentice Hall, 2003

Juite Wang and Yun-I Lin, A fuzzy multicriteria group decision-making approach to select configuration items for software development, Fuzzy Sets and Systems, Volume 134, Issue 3, 16 March 2003, Pages 343-363

Jablonowski, 2000, Why Risk Analyses Fail, Journal of CPCU, Winter2000, Vol. 53 Issue 4, p223,

Testing the Liberal and Social Feminist Theories:
A Study on Small Sized Enterprises

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ABSTRACT

The purpose of this study is to ascertain the similarities and differences among female and male entrepreneurs in small-scaled enterprises based on the theory espoused by the Liberal and Social Feminist. The study also attempts to investigate the main hypothesis that small enterprises owned by female generally under-perform male owned enterprises on a variety of measures such as capital, sales and number of employees. The study tests five hypotheses and finds support for liberal feminist theories (female entrepreneurs are les successful, leave fulltime education earlier and have fewer years of working experience than male entrepreneurs). On the other hand, with respect to the social feminist theory, the study provides support to the difference characteristics possessed by female and male entrepreneurs but shows mixed evidence of the motivational factors for the business set-up.

INTRODUCTION

There has been a huge growth in studies on various aspects of entrepreneurship. The focus of these studies has been on observing and describing the characteristics of the entrepreneurs (Chu, 2000 and Dhaliwal, 2000); the problems face by the entrepreneurs (Coleman, 2002); their motivations (Lee, 1997; Orhan & Scott, 2001 & Scott, 1986); the profile and typology of the entrepreneurs (Cromie & Hayes, 1988; Ufuk & Ozgen, 2001; Stevenson, 1986 & Hisrich & Brush, 1987); the differences between women and men entrepreneurs (Mahadea, 2001; Mukhtar, 2002; Ljunggren & Kolvereid, 1996; Catley & Hamilton, 1998; Du Rietz & Henrekson, 1999; Mills & Voerman, 1999 & Rosa, Carter & Hamilton, 1996) as well as discussing the institutional factors that encourage entrepreneurship (Welter, 2002 & Winn, 2000). Thus, the study of entrepreneurs has occupied a position on the research agenda and academic institutions in a variety of disciplines.

Basically, entrepreneurship is defined as the process of creating a business with combination of necessary skills, time and effort by taking responsibility on the development of the business as well as financial, physical and social risks to gain the monetary rewards and personal satisfaction (Hisrich and Brusch, 1986). Schumpeter (1934) ties entrepreneurship with innovation by defining entrepreneurship as "carrying out new combinations". Contrary with the remarks he made prior, Schumpeter claims that he does not define an entrepreneur as an innovator but says he "has no objection to some such expression". Meanwhile, Drucker (1985) defines entrepreneurs as those who shift economic resources from lower level into a higher productivity with greater return.

Gartner (1985) defines entrepreneurship as the creation of new organizations and mentions that arguments over the definitions on entrepreneur and entrepreneurship have hampered research progress. In 1990, he adds that a consensus on entrepreneurship definition is hardly to be reached. He recommends that a specific definition should be carefully developed to suit with the purpose of the respective research. In this study, women entrepreneurs are defined as women owner managers. Their ownership may be acquired through their own creation, through inheritance or be jointly established with or without family or non-family members and they must be actively involved in the business (Chu, 2000).

Recently, research on sex and gender differences in entrepreneurial characteristics and performance has continues to receive a considerable amount of attention. The empirical findings and recommendations reported are diverse and sometimes contradictory. Many studies suggest that there are few differences between the experiences and needs of female and male entrepreneurs while other studies seem to confirm the coexistence of male and female entrepreneurs in traits. Brusch (1992) study in U.S. examines a great many aspects of female entrepreneurship, which found to be underperformance than the male counterparts by conventional production, employment, profitability and other performance indicators. In support to that, Rosa, Carter and Hamilton (1996) study in Britain

find that female entrepreneurs tend to be less successful than their male counterparts in terms of conventional economic performance measures such as profitability and growth in sales, value added and employment. Lipper (1988) states that an entrepreneur can be successful without achieving monetary profits if he defines success other than monetary measures. Thus, this study springs up from the basic question: 'Are women entrepreneurs difference from men counterparts?'

There have been numerous studies worldwide on performance of women entrepreneurs with comparison to male counterparts but this area is relatively unexplored in Malaysia case despite the fact that women have significantly contributed to the Malaysian economy. According to 2000 population census, the share of women employed is found highest in production and related workers sector (22.6 per cent), followed by clerical and related works (17.5 per cent), service workers (17.4 per cent), agriculture workers (14.8 per cent), professional, technical and related workers (13.5 per cent), sales and related workers (12.1 per cent) and lastly, administrative and managerial workers (2.2 per cent). In tandem to that, Malaysian government is taking continuous efforts towards the involvement of women in income-generating activities. Various women entrepreneur and industry association are formed, generally to serve as a platform for women entrepreneurs to establish networks and exchange information and experiences as well as to conduct training programs, seminars, and workshops on motivation, leadership and entrepreneur development. (Malaysian Eighth Plan, 2002). Taking awareness of the government policy in encouraging the involvement of women in business calls for this study to be undertaken in order to obtain a better understanding of this group of people who had generously contribute to the Malaysian economy.

The study will concentrate on the women entrepreneurs involve in small sized enterprises. According to Hashim and Wafa (2002), small and medium sized enterprises are created by entrepreneurs and they are responsible for making decisions and solving problems in their organization. These entrepreneurs tend to exhibit certain characteristics. Small enterprises represent particularly appropriate opportunities for women entrepreneurs, as they respond flexibly to entry, change and innovation. Although it can be dynamic, the small sector is all too often marked by outdated and inefficient practices and technologies. As a result, small enterprises tend to operate far below their productive capacity. This relates especially to women, as despite good levels of education and high participation in the labor market, they become entrepreneurs on average twice less often than men (UNECE, 2002).

This study aims to explore the nature and characteristics of gender determinants in the performance of small scaled enterprises. This study, which motivates from the liberal and social feminist theories, attempts to explore the underlying factors that lead female and male entrepreneurs to enter the entrepreneurship field as well as to investigate the personal traits of those entrepreneurs.

LITERATURES SURVEY

Most of the theories of entrepreneurship are widely created by men and indeed applied to men (Holmquist and Sundin, 1988). But, nowadays, the theories are broadly used to evaluate women entrepreneurs' performances (Carter and Weeks, 2002). According to Chell and Baines (1998), the male performance is seen as a norm, and female performance tends to be under judged against this norm. Thus, if female behaviours are no match to male traits, women are unlikely to be well equipped to perform as an entrepreneur within the definition.

Meanwhile, according to Brusch (1992) out of 57 gender's studies reviewed, 39 percent (%) do not base on any theories and majority of the studies concluded that the female are under performance than male by using a single performance measurement such as financial gain. In addition, Mirchandani (1999) emphasizes the need of adapting the gender-based theories into the small and medium enterprises researches in order to change both male and female perspectives. He further states "approaches to women and entrepreneurship would benefit greatly from theoretical insight on the gendered processes in work settings developed within feminist theory". Fisher, Reuber and Dyke (1993) respond to the need by developing liberal feminist and social feminist theories, which is more systematic knowledge base.

Liberal and social feminist theories are broadly used to understand, explain and study the inequity social status of women in society. Most of the liberal feminist literatures study the differences of female and male entrepreneurs with respect to business performance and segregation of social opportunities such as education and experience. On the other hand, social feminist studies are carried out to investigate the similarities and differences between women and men entrepreneurs with respect to entrepreneurial motivation and personal characteristics (Carter and Williams, 2003).

Liberal feminist theory is seen as the root of liberal political philosophy that espouses the basic belief of that human beings are equal, essentially rational and self-interest seeking agents (Fischer et al., 1993). The theory does not recognize any inherent gender differences and any physical differences exist between men and women are assumed to be irrelevant to rationality. Besides that, rationality is also assumed to be pure mental capacity and held equity within every person regardless of the gender. Thus, the theory states that women are as equally capable of rationality as men but they are segregated from social opportunities such as education and experience. According to Mills and Voerman (1997), the main reason fostering the differences between men and women is sexism, which consists of a blend of prejudices and discriminatory practices against women that in turn influence their social purposes.

On the other hand, social feminist theory is a theory of oppression, which views women as oppressive, unequal, difference and restrain due to the socialization and maltreated of the patriarchal system. With contrast to the liberal feminist theory, it explains that female and male are indeed difference due to the socialization process they experienced. The theory categorized male and female entrepreneurs as two separate groups, each with an equally valid, but they are distinct in the way of thinking and rationalizing. Social feminist theory also posits that the differences between female and male exist from the earliest moments of life which are due to the fundamentally difference ways of viewing the world. In addition, the theory assigns that the female and male entrepreneurs are subject to experience difference socialization processes due to their gender. Those difference socialization processes will lead them to be difference in respect of psychological characteristics such entrepreneurial motivations and personal traits.

With regard to education, Fischer et al. (1993) shows no support to the liberal feminist theory that states the female entrepreneurs have less access to relevant education than male counterparts. They recommend that the only significant difference appears where male entrepreneurs tend to have more production-related business educational than female. On the other hand, they provide support to the theory when they find out that female entrepreneurs tend to have less prior experience, as men are more likely to have more experiences in the business start up. With respect to psychological traits, they state that there are gender differences entrepreneur's traits such as self-actualisation, self-confidence, compassion and risk taking propensity as well as differences in motivations.

In parallel to liberal feminist theory, Mills and Voerman (1997) find out that female entrepreneurs in Sweden and Netherlands tend to operate a smaller business than male counterparts. They also highlight that although women entrepreneurs left the formal education average four years earlier than male counterparts, but they still have less relevant work experiences. They stress that this is due to the female entrepreneurs always switching job between sectors or they do not start working immediately after leaving the school due to marriage and children rearing. They concludes that the reason why women entrepreneurs are less capable to realize their full potential than men entrepreneurs is due to segregation from accessing essential social opportunities such as education and experience. On social feminist aspect, they find out that the psychological characteristics of the female respondents are almost the same as male counterparts.

According to Watkins and Watkins (1983), the male entrepreneurs are more likely to have relevant entrepreneurial education and prior experience compare to female counterparts that will result in low performance of female entrepreneurs as compared with male entrepreneurs. In opposite theory, they find out that men entrepreneurs are risk gamble and majority of them established their businesses due to the personal factors such as self-independent and autonomy while most of the female counterparts are motivated by the financial factors.

Hisrich and Brush (1986) states that the motivations for the female entrepreneurs to start up the business are job satisfaction, independent, achievement and to survive. In addition, Hisrich et al. (1996) confirm that men respondents are more insolence, selfish and hard working, while the female respondents are more active, inventive and effective. Sexton and Bowman-Upton (1990) further stress that men entrepreneurs have higher energy level than female counterparts on value placed on autonomy and risk taking propensity but, the female entrepreneurs have higher willingness to accept change. Lastly, the study conclude that there is a slightly difference between female and male entrepreneurs with regard to psychological characteristics.

The study conducted by Lee and Rogoff (1997) attempts to explore the similarities and differences between female and male entrepreneurs in terms of psychological characteristics such entrepreneurial motivations, attitudes and satisfactions. They point out that the self-actualisations such as goals of maximizing personal skills, contributing to society and gain respect and reorganisation are the core motivations that pulled the female entrepreneurs to start up the business. But, they conclude that the female entrepreneurs' motivation to start up the business was slightly difference from men counterparts.

In a local study done by Ismail and Joned (1999) on 109 Malay women entrepreneur, they find out that 42.4 percent (%) of respondents are predominant in service-oriented business, 40% have more than RM 100,000 total paid up capital, 66% have less than RM 200,000 value of sales per annum. In addition, they also state that 35% have previous working experience in administration, education, finance, public relations and business.

Hence, from the brief summary above, we can conclude that the result of empirical study on liberal and social feminist theories is mixed, thus provides a platform for further discussion.

HYPOTHESES

The study is mainly extending several previous studies that apply liberal and social feminist theories. Therefore, this section presents the hypotheses that are formulated from the previous studies (Fischer, Reuber and Dyke, 1993; Mills and Voermen, 1997 and Du Rietz and Heurekson, 1999).

Hypothesis 1: Female entrepreneurs are less successful than male counterparts.
Hypothesis 2: Female entrepreneurs posit difference education background compare to male counterparts.
Hypothesis 3: Female entrepreneurs have less working experience than male counterparts.
Hypothesis 4: Female entrepreneurs have difference entrepreneurial motivations than male counterparts.
Hypothesis 5: Female entrepreneurs have difference personal traits than male counterparts.

DATA ANALYSIS

Data was collected from the respondents who are the owner of small enterprises. For the purpose of the study, small-sized enterprises are defined as a firm with an annual turnover of not less than RM10 million and employ full time employees of not exceeding 50 persons (Hashim and Wafa, 2002). A total of 300 sets of questionnaires were distributed, where only 159 questionnaires were received, with 151 useable responses which gives a net response rate of 50.3 per cent. Out of 151 net responses, 75 responses were from male and 76 sets from female entrepreneurs. These response rates are considered low despite the fact that a follow-up call was made two week after the questionnaires were mailed in an effort to increase response rate. Coefficient Alpha value for the pilot study that carried out by interviewing 10 entrepreneurs in SMEs, Kuching is 0.9076. According to Israel (1992), an alpha of 0.8 is generally considered good to indicate the strong internality consistency in index. Thus, the scales of scores for the questionnaire are highly reliable and all of the items listed are consistent in measuring the variables of study.

This study is carried study out using a survey methodology. A questionnaire has been developed and included a combination of scaled, multiple choice, open-ended and rank order questions. The questions formed are used to assess the following; business data, business performance, motivation for starting a business; characteristics of the entrepreneurs, and selected demographic characteristics. To measure the entrepreneur's business performance, the study used three indicators such as sales, capital and number of employees that includes measure of changes over four years as formulated in Fischer, Reuben & Dyke (1993). Meanwhile, this study adopted the dimensions used in Hisrich and Brusch's study (1986) to measure the personality characteristics of the entrepreneurs. Three items have been selected which are self-independent, willingness to take a risk and self-confidence. On the other hand, this study used three types of motivation to measure the reason for entrepreneurs to start-up their business, which are financial, lifestyle and social recognition motivation.

Descriptive statistics such as means, standard deviations, and percentage will be used to record and analyze the respondents' demographic characteristics with respect to the company's profiles. To test the hypotheses highlighted in the study, λ^2 tests comparing means for women and men entrepreneurs on the performance indicators, characteristics and motivation and performance are conducted.

RESULTS AND DISCUSSION

Business Activities

As shown in Table 1 below, female enterprises are found higher in food, cloth and services business than the male entrepreneurs who involved more in manufacturing and computer business. In service industries, female involved

more on feminine-related services such as saloon, beauty centre, boutique and floweriest; while male engaged more in transportation and car servicing business.

Table 1: Type of Business Activities of Female and Male Entrepreneurs

Business activities	Male		Female	
	Frequency	Percentages (%)	Frequency	Percentages (%)
Manufacturing	14	18.67	1	1.32
Cloth	4	5.33	14	18.42
Food	13	17.33	36	47.37
Service	19	25.33	20	26.32
Retail	7	9.33	0	0.00
Computer	10	13.33	1	1.32
Others	8	10.67	4	5.26
TOTAL	75	100	76	100

Female and Male Entrepreneurs' Business Performance

The variables of capital, sales and the total number of employees are selected to assess the business performance of the entrepreneurs. The findings and results in this section are used to answer the following hypothesis:

Hypothesis 1:   Female entrepreneurs are less successful than male counterparts.

In an independent sample t-test for capital variable by respondents' gender as illustrated in Table 2 below, the p value (0.003) is less than 0.01 of significant level which explains that the total amount of capital is closely related to the gender of respondents and there is a significant difference between female and male respondents with regard to initial capital as well as annual capital.

Table 2: Comparison of Female and Male Entrepreneurs on Capital Variable

Capital (RM)	Male		Female	
	Mean	Standard Deviation	Mean	Standard Deviation
Initial capital	16 431.68	20 131.72	5 297.30	5 053.85
2000	37 817.95	42 174.99	14 902.56	20 356.61
2001	37 705.13	42 068.19	14 680.00	20 143.18
2002	38 474.36	42 368.83	14 855.00	20 110.22
2003	38 705.13	42 264.47	14 885.00	20 178.24

Note: A λ^2 test indicates a significant difference in capital variable between female and male respondents ($\rho = 0.03$)

The annual sale variable is one of the indicators that are used to assess the business performance of the respondents as illustrated in Table 3 as follows.

Table 3: Comparison of Female and Male Entrepreneurs on Sales Variable (RM)

Sales (RM)	Male		Female	
	Mean	Standard Deviation	Mean	Standard Deviation
2000	68 033.33	54 569.320	29 371.79	25 045.63
2001	67 905.13	54 353.013	28 912.50	24 892.52
2002	68 848.72	54 915.63	28 912.50	24 892.52
2003	69 246.15	55 277.74	28 812.50	24 722.44

Note: A λ^2 test indicates a significant difference in capital variable between female and male respondents ($\rho = 0.02$)

In a λ^2 test, value of 0.002 indicates that there is a significantly difference between female and male respondents with regard to the annual sale in 2000 to 2003.

The findings with regard to the total number of employees employed by female and male entrepreneurs are illustrated in Table 4 below. In a λ^2 test, ρ value less than 0.1 illustrates that there is a merely significance difference between female and male respondents with respect to total number of employees.

Table 4: Comparison of Female and Male Entrepreneurs on Employees Variable

Employees (Number)	Male		Female	
	Mean	Standard Deviation	Mean	Standard Deviation
2000	4.69	8.627	1.26	1.371
2001	4.87	8.606	1.25	1.354
2002	4.97	8.601	1.28	1.339
2003	5.23	8.616	1.22	1.349

Note: A λ^2 test indicates a significant difference in number of employees' variable between female and male respondents (ρ = 0.05)

With regards to the liberal feminist theory, the findings of this study have clearly revealed that the female entrepreneurs in small-sized enterprises have grasp lower annual sales, operate smaller firm with lower initial capital and employ less number of workers as compared to male counterparts. Besides that, this study also recommends that the female entrepreneurs tend to be underrepresented in manufacturing and construction sectors compare to male counterparts.

Female and Male Entrepreneurs' Education Background

The education backgrounds of female and male respondents are measured in two aspects, namely highest formal education level and the field of expertise. The findings and results are used to ascertain the hypothesis that related to liberal feminist theory. The hypothesis is as following:
Hypothesis 2: Female entrepreneurs will have difference education background compare to male counterparts

Table 5 and 6 show the comparisons of females and males with respect to education and field of expertise. It indicates that there is a significant sex differences in education and expertise. With respect to education, male have higher educational level with more than 70% of them have at least SPM/SPMV certificate. On the other hand, more than 60% of female entrepreneurs have at most SRP/PMR certificate with 17.11% of them did not receive any formal education as compared to male with only 2.67%.

Table 5: Female and Male Entrepreneurs' Highest Formal Education Level

Educational Level	Male		Female	
	Frequency	Percentages (%)	Frequency	Percentages (%)
No	2	2.67	13	17.11
Primary School	6	8.00	21	27.63
SRP/PMR	14	18.67	12	15.79
SPM/SPMV	23	30.67	18	23.68
STPM/Certificate/Diploma	19	25.33	12	15.95
Bachelor/Master Degree	11	14.67	0	0.00
Total	75	100	76	100

Note: A λ^2 test indicates a significant difference in educational level between female and male respondents (ρ = 0.03)

As shown in Table 6, more than 67% of the female entrepreneurs failed to identify their field of expertise with personnel recorded the highest field possessed by female (21.05%). Male are found to be more expert in marketing, accounting as well as information technology as compared to female counterparts.

Table 6: Female and Male Entrepreneurs' Field of Expertise

Field of Expertise	Male		Female	
	Frequency	Percentages (%)	Frequency	Percentages (%)
No	24	32	51	67.11
Marketing	11	14.67	2	2.63
Personnel	2	2.67	16	21.05
Accounting	8	10.67	3	3.95
Information Technology	8	10.67	2	2.63
Technical	22	29.33	2	2.63
Total	75	100	76	100

Note: A λ^2 test indicates a significant difference in the field of expertise between female and male respondents ($\rho = 0.05$)

Female and Male Entrepreneurs' Working Experience

Table 7 below illustrates the results of previous working experience by female and male respondents. The result in this section is used to ascertain the following hypothesis:
Hypothesis 3: Female entrepreneurs have less entrepreneurial working experience than male counterparts.

Table 7: Female and Male Entrepreneurs' Working Experience

Working Experience	Male		Female	
	Frequency	Percentages (%)	Frequency	Percentages (%)
No	9	12.00	19	25.00
Government Sector	13	17.33	4	5.26
Private Sector	50	66.67	28	36.84
Others	3	4.00	25	32.89
Total	75	100	76	100

Note: A λ^2 test indicates a significant difference between female and male respondents ($\rho = 0.002$) with respect to previous working experience

Female and Male Entrepreneurs' Entrepreneurial Motivations

The findings and the results in this section are used to ascertain the hypothesis that related to social feminist theory. The hypothesis is as following:
Hypothesis 4: Female entrepreneurs will have difference entrepreneurial motivations than male counterparts

Table 8: Female and Male Entrepreneurs' Motivation

Type of Motivation	Male	Entrepreneur	Female	Entrepreneur
	Means	Standard Deviation	Means	Standard Deviation
Financial Motivation[a]	2.61	1.064	2.04	0.799
Lifestyle Motivation[b]	3.56	1.145	2.17	0.748
Social Recognition Motivation[c]	2.30	0.883	3.55	1.072

Note: A λ^2 test indicates a significant overall difference between female and male respondents with respect to motivation of entrepreneurs
[a] $\rho = 0.037$;   [b] $\rho = 0.001$;   [c] $\rho = 0.000$;

The results provide mixed support to the hypothesis where female and male entrepreneurs are indifference in financial motivation but for lifestyle and social recognition motivation, there are significant differences between the genders.

Female and Male Entrepreneurs' Personal Traits

The similarities and differences between female and male with respect to personal traits are measured on three aspects: self-independent, risk taking propensity and self-confidence. The result is used to ascertain the hypothesis of social feminist theory as follows.

Hypothesis 5: Female entrepreneurs will have difference personal traits than male counterparts

Table 9: Female and Male Entrepreneurs' Characteristics

Type of	Male	Entrepreneur	Female	Entrepreneur
Motivation	Means	Standard Deviation	Means	Standard Deviation
Self Independent[a]	2.56	0.818	2.74	0.966
Risk Taking[b]	2.20	0.758	3.60	0.848
Self Confidence[c]	2.17	0.733	3.31	0.863

Note: A λ^2 test indicates a significant overall difference between female and male respondents with respect to personal traits
[a] $\rho = 0.000$;   [b] $\rho = 0.001$;   [c] $\rho = 0.002$;

The table illustrates that female entrepreneurs are difference from male counterparts with respect to personal characteristics. Male entrepreneurs are more self-confidence, self-independent and risk-taking propensity than female counterparts.

CONCLUSIONS

Given the importance of entrepreneurial success to organizations primarily, there is a need to determine how gender of the entrepreneur is related to entrepreneurial success. This study hopes to help particularly small-scaled entrepreneurs to understand the role of relevant performance in determining their success or failure. This increased understanding will allow them to be able to exert influence over others more effectively. The contribution of the study expects to shed some light on one of the underlying success factors of entrepreneurs to help them to compete more effectively in the competitive market, which has to date still lack in Malaysia context. Besides, it will be interesting to see the moderating effect of gender on certain performance indicators.

Policy makers should give more focus to the differences between female and male entrepreneurs when creates and designs entrepreneurship assistance programs. Those potential programs need to be tailored by taking the differences into account. In order to increase the performance of female entrepreneurs, the policy maker should create, design and implement more specialized training programs and consulting, specifically targeting women entrepreneurs at various stages in their business careers. Besides that, the policy maker should also taking initiatives to reduce the risk and expense of making smaller loans by promoting support services such as access to capital and credit specifically targeting women entrepreneurs. In addition, the policy maker is recommended to promote innovative incentives such as tax credits to increase the growth of female entrepreneurs, and improve the recognition of service-based businesses in order to increase the existing number of female entrepreneurs. While, female entrepreneurs are recommended to furnish themselves with new knowledge in the field such as technical, information technology and financial in order to be more competitive and well equipped. In order to increase their ability to compete, they should also be more independent and confident and be a moderate risk taker when operating the business.

REFERENCES

Brusch, C.G. (1992), "Research on Women Business Owners: Past Trends, a New Perspective and Future Direction." Entrepreneurship Theory and Practice Vol Summer, pp. 5 – 30

Carter, N.M. and Williams, M.L. (2003). "Comparing Scoial Feminism and Liberal Feminism: The Case of New Firm Growth" in New Perspectives on Women Entrepreneurs. Greenwitch: Information Age Publishing.

Carter, S. and Weeks, J. (2002). Gender and Business Ownership : International Perspective On Theory and Practice. Entrepreneurship and Innovation, 3(2), 81-91.

Catley, S. and Hamilton, R.T. (1998). "Small Business Development and Gender of Owner" Journal of Management Development Vol. 17 (1) pp. 75 - 82

Chell, E. and Baines, S. (1998). Does Gender affect Business Performance? A Study of Microbusinesses in Business Services. The U.K. Entrepreneurship and Regional Development, 10(2), 117-135.

Chu, P. (2000). "The Characteristics of Chinese Female Entrepreneurs: Motivation and Personality" Journal of Enterprising Culture Vol 8 pp. 67 - 84

Coleman, S. (2002). "Constraints Faced by Women Small Business Owners: Evidence from the Data" Journal of Developmental Entrepreneurship Vol 7 (2) pp. 151 – 174

Cromie, S and Hayes, J. (1988). "Towards a Typology of Female Entrepreneurs" The Sociological Review Vol 36 (1) pp. 87 - 113 Dhaliwal, S. (2000). "Entrepreneurship – A Learning Process: The Experiences of Asian Female Entrepreneurs and Women in Business" Education & Training Journal Vol 42 (8) pp. 445 – 452

Drucker, P.F. (1985). Innovation and Entrepreneurship New York: Harper & Row

Du Rietz, A. and Henrekson, M. (1999). "Testing the Female Underperformance Hypothesis" Forthcoming Small Business Economics

Fischer, E., Reuber, A. and Dyke, L. (1993) "A Theoritical Overview and Extension of Research on Sex, Gender and Entrepreneurship." Journal of Business Venturing Vol 8, pp. 151 – 168

Gartner, W.B. (1985). "A Conceptual Framework for Describing the Phenomenon of New Venture Creation" Academy of Management Review Vol 10 pp. 696 - 706

Gartner, W.B. (1990). "What Are We Talk About When We Talk About Entrepreneurship?" Journal of Business Venturing Vol 5 pp. 15 - 28

Hashim, M.K. and Wafa, S.A. (2002). Small and Medium-Sized Enterprises in Malaysia: Development Issues. Toronto: Lexington Books

Hisrich, R.D. and Brusch, C.G. (1987). "Women Entrepreneurs: A Longitudinal Study." Frontiers of Entrepreneurship Research Wellesley, MA: Babson College

Hisrich, R.D. and Brush, C. (1986). The Woman Entrepreneur – Starting, Financing and Managing a Successful New Business. Toronto: Lexington Books

Hisrich, R, D., Brush, C, G., Good, D. and De Souza, G. (1996). Some Preliminary Findings On Performance in Entrepreneurial Ventures: Does Gender Matter? Frontiers of Entrepreneurship Research. Wellesley, Massachusetts: Babson College.

Holmquist, C. and Sundin, E. (1988). Women as Entrepreneurs in Sweden – Conclusions From a Survey. Frontiers of Entrepreneurship Research. Wellesley, Massachusetts: Babson College.

Ismail, M. and Joned, R. (1999). The Profile and Value System of Women Entrepreneurs in Ismail, M. and Ahmad, a. Women and Work: Challenges in industrializing National. The United Kingdom: Asean Academic Press Ltd.

Israel, G, D. (1992). Analyzing Survey Data. Florida: University of Florida.

Lee, J. (1997). "The Motivation of Women Entrepreneurs in Singapore" International Journal of Entrepreneurial Behaviour & Research Vol 3 (2) pp. 93 - 110

Ljunggren, E. and Kolvereid, L. (1996). "New Business Formation: Does Gender Make A Difference?" Women in Management Review Vol. 11 (4) pp. 3 – 12

Mahadea, D. (2001). "Similarities and Differences Between Male and Female Entrepreneurial Attributes in Manufacturing Firms in the Informal Sector in the Transkei" Development Southern Africa Vol 18 (2) pp. 189 – 199

Malaysia Eighth Plan (2002). Kuala Lumpur: Percetakan Negara

Mills, M. and Voerman, J.A. (1999). "Female and Male Entrepreneurs in Sweden and the Netherlands: A Test of Liberal and Social Feminism" Working paper University of Groningen The Netherlands

Mirchandani, K. (1999). Feminist insight on Gendered Work: New Directions in Research on Women and Entrepreneurship. Gender, Work and Organization, 6(4), 224-236.

Mukhtar, S.M. (2001). "Differences in Male and Female Management Charateristics: A Study of Owner-Manager Businesses" Small Business Economics Vol 18 pp. 289 – 311

Orhan, M. and Scott, D. (2001). "Why Women Enter Into Entrepreneurship: An Explanatory Model" Women in Management Review Vol 16 (5) pp. 232 – 243

Rosa, P., Carter, S. and Hamilton, D. (1996), "Gender as Determinant of Small Business Performace: Insights from a British Study." Small Business Economics Vol 8 (4) pp. 463 - 478.

Schumpeter, J.A. (1934). "Economic Theory and Entrepreneurial History" in Sue Birley (ed), Entrepreneurship 1998 Dartmouth: Ashgate pp. 3 – 21

Scott, C.E. (1986), "Why More Women Are Becoming Entrepreneurs." Journal of Small Business Management Vol. 24 (1), pp. 37 – 44

Sexton, D, L. and Bowman-Upton, N. (1990). Female and Male Entrepreneurs: Psychological Characteristics and Their Role in Gender Related Discrimination. Journal of Business Venturing, (5)1, 29-

36.Stevenson, L.A. (1986). "Against All Odds: The Entrepreneurship of Women." Journal of Small Business Management Vol 24 (4) pp. 30 – 36

Ufuk, H. and Ozgen, O. (2001). "The Profile of Women Entrepreneurs: A Sample of Turkey". International Journal of Consumer Studies. Vol 4 pp. 229 - 308

UNECE (2002). "Women's Entrepreneurship in Eastern Europe and CIS Countries" Entrepreneurship and SMEs Series. Geneva: United Nations

Watkins, J, M. and Watkins, D, S. (1983). The Female Entrepreneur: Her Background and Determinants of Business Choice-Some British Data. Frontiers of Entrepreneurship Research. Wellesley, Massachusetts: Babson College.

Sales Promo-Tools And Product Trial

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Abstract

Various sales promotional tools (promo-tools) have been employed by marketers over the years to generate sales for their offerings. The use of coupon, price discount, free sample, bonus pack, and in-store display are examples of sales promotion strategies adopted by organizations to generate product trial and repurchase. Although most of these tools are used very frequently in Malaysia, there is still very poor understanding of their impact on product trial among researchers and practitioners who deploy these strategies. The current research is an attempt to unveil the influence of coupon use, cash discount, free sample, bonus pack, and in-store display on product trial among Malaysia consumers. Randomly selected consumers in Kota Kinabalu, Sabah were surveyed using structured questionnaire. A total of 312 usable responses were received and analyzed. The results show that price discount, free sample, bonus pack, and in-store display are robust determinants of product trial. Coupon is not. Details of the findings and their implications are discussed.

INTRODUCTION

Blattberg, and Neslin (1990, p.15), have mentioned that sales promotion expenditures have grown rapidly in recent years, even advertising remains an important promotion tool. And the field of sales promotion has attracted increasing attention from both executives and researchers in recent years. This growing interest is the result of the increasing importance of sales promotion activities in marketing strategy. According to Gilbert and Jackaria (2002), sales promotion consists of a wide variety of short-term tactical promotional tools aimed at generating a desired response from customers. There is a large body of literature on consumer response to sales promotions (e.g., Bawa & Shoemaker, 1987 and 1989; Gupta, 1988; Blattberg & Neslin, 1990; Leone & Srinivasan, 1996; Huff and Alden, 1998).

Though these studies have provided important insights into the effects of sales promotions, their usefulness in predicting the effects of sales promotions on product trialability of consumers is limited as too much emphasis has been placed on coupons at the expense of other equally important promotional tools. Thus, very little work has been done to investigate the effect of sales promotional tools such as free sample, bonus pack and in-store display on product trial. Therefore, the purpose of this current work is to integrate existing research and extends our understanding of consumer response to sales promotions. More specifically, it examines the degree to which sales promotion variables such as coupons, price discount, samples, bonus packs, and in-store display can predict product trial.

LITERATURE REVIEW

There are large numbers of studies addressing the question of how promotions affect individual purchase behaviour. Before a review of these studies, it is germane to understand the meaning of the term sales promotion.

Definition of Concepts

According to Shimp (2003), sales promotion refers to any incentive used by a manufacturer to induce the trade (wholesalers, retailers, or other channel members) and/or consumers to buy a brand and to encourage the sales force to aggressively sell it. Retailers also use promotional incentives to encourage desired behaviours from consumers-come to this store rather than a competitor's; buy this brand rather than another; purchase larger quantities; and so

on. Sales promotion is more short-term oriented and capable of influencing behaviour. Totten & Block (1994) stated that the term sales promotion refers to many kinds of selling incentives and techniques intended to produce immediate or short-term sales effects. Typical sales promotion includes coupons, samples, in-pack premiums, price-offs, and so on.

Fill (2002) defined coupons as vouchers or certificates, which entitle consumers to a price reduction on a particular product. The value of the reduction or discount is set and the coupon must be presented when purchasing the product. Coupons are a proven method by which manufacturers can communicate with consumers and are a strong brand-switching device. Gardener and Trivedi (1998) wrote that coupons have been used as a major promotional tool for years as a means of offering the consumer a one-time reduction in price and building brand awareness and loyalty as well. In fact, coupons have the potential to induce brand switching and induce purchase, indicating that consumers are influenced by the discount stated in the coupon. Fill (2002) stated that discount is the simplest technique to offer a direct reduction in the purchase price with the offer clearly labelled on the package or point of purchase display. By definition, sampling includes any method used to deliver an actual- or trial-sized product to consumers. According to Pramataris, Vrechopoulos, and Doukidis (2001), sampling is the activity of offering small quantities of product to consumers for free, in order for them to try it and potentially buy it. Gardener and Trivedi (1998) wrote that bonus packs are offers by the manufacturer that add value to the product by offering additional product at the regular price. According to Percy, Rossiter, and Elliott (2001), bonus packs do create an immediate incentive to buy. And Seibert (1996) stated that manufacturers like bonus pack because they increase brand trial, switching and stocking up. Percy, Rossiter, and Elliott (2001) wrote that display promotions could be an important part of an integrated marketing communication programme. Good display material leads to better attention, especially important for brands driven by recognition awareness and increase recognition at the point of purchase (trial).

Chandon, Wansink, and Laurent (2000) indicate that sales promotion may be attractive for highly promotion prone consumers for reasons beyond price savings. These highly promotion prone consumers may switch brands to receive "special" deals that reflect and reinforce their smart shopper self-perception. The highly promotion prone consumers might try a new product that have promotion.

Product trial involves actually trying or using a product (Kardes, 1999). According to Peter and Olson (1996), trialability refers to the degree to which a product can be tried on a limited basis or divided into small quantities for an inexpensive trial.

Sales Promotion as a Determinant of Product Trial

Banks (2003) wrote that with sales promotion, brands have a chance to quickly affect consumer choice and behaviour by adding value through an on-pack offer, by achieving incremental display or by encouraging trial via sampling and/ or couponing. According to Schindler (1998), a price promotion that is designed to evoke attributions of responsibility could be expected to appeal to consumers more than one that does not evoke such attributions, and thus have a greater ability to create product trial of consumers.

Sales promotional tools such as coupons, discount, and free samples used strategically in various industries not only increase brand awareness, but also encourage consumers to try new products. For example, a manufacturer might utilize coupon incentives to encourage consumers to try the "new flavoured product X," enabling them to try the new flavour at a discounted price, instead of buying the same flavour they normally do at full price. Therefore, this incentive may reduce consumers' perceived risk associated with trying a new, less-familiar product for the first time (Blackwell, Miniard, and Engel, 2001).

Blackwell, *et al* (2001) described that new products are more apt to succeed when consumers can experiment with or try the idea on a limited basis, with limited financial risk. Therefore, sales promotion such as sampling, couponing, and trial-sized products are useful to induce the trial of products. For example, Procter & Gamble and General Foods give millions of new products away each year to make trial easy without economic risk to the consumer. However, Gilbert and Jackaria (2002) found that a free sample as a promotional offer had no significance on a consumer's reported buying behaviour.

Robinson and Carmack (1997) stated that coupons have been used to produce trial. According to Cook (2003), coupons are easily understood by the consumer and can be highly useful for trial purchase. "With more than 80% of

the American population in all demographics using coupons, marketers know that a strong coupon strategy is one of the most effective ways to directly motivate trial," said Charles Brown, vice president of marketing for NCH Marketing Service co-chair of the Coupon Council (Press Releases, 7/8/2003). But, in Gilbert and Jackaria (2002) findings, coupon is ranked last as the promotional least widely used by consumers and least influence on product trial.

The study by Wayne (2002) about new consumer research on three recent coupon programs showed that the promoted brands gained incremental sales through increased trial and subsequent non-coupon purchases. In the research it was found that six months after receiving one of these coupon offers, consumers were between two and five times more likely to have bought and used the promoted brand in the past than were a control group of similar consumers who had not received the coupon. Consumers who received the coupon offer were also twice as likely to indicate that they would buy the promoted brand in the future. Wayne observed that coupon offers can generate product trial and increase market share and brand sales. Moreover, coupons also can improve the future brand purchase intentions of consumers who receive the offers and build brands by building sales and market share, as well as by defending against competitive promotional activity

The coupon is the most common form of menu discounting and a generally accepted belief is that coupons contribute to short-term sales but are no substitute for a long-range advertising plan. However, coupon can be used to attract new customers to try and then will return later to pay full price for repeat purchase (Nation's Restaurant News, 1985). But, at worst, coupons maybe not encourage consumers to repeat purchase by paying full price. The customers maybe waiting until the next coupon is received to frequent the store (Nation's Restaurant News, 1985). From a study of supermarket shoppers, Cheong (1993) found that supermarket coupons increase the number of items bought but not increasing the total amount spent. The results of consumer surveys indicated that 91 percent of consumers believe coupons cause higher retail prices (Advertising Age, 1988).

Price promotion does influence new product trial (Brandweek, 1994). According to Ehrenberg *et al.* (1994), the short-term peaks in sales were due primarily to purchases made by occasional users of a brand rather than by new customers. Furthermore, the study concluded that these occasional users, after taking advantage of the price reduction, would most likely return to their favourite brands in their portfolio rather than buy the promoted brand at full price.

Free sample is another important promotional tool often used by marketers. Marketing manager recognize the importance of product trial and direct behavioural experience with a product. They often mail free samples of products to consumers so that consumers can try the products for themselves, rather than just hear about the products (Kardes, 1999).

Lee (1963) mentioned that factory bonus pack is used to increase consumer trial of the brand. Gardener and Trivedi (1998) wrote that larger package size and accompanying advertising of the offer tend to make the promotion noticeable. Since more of the product is included at no extra cost, consumers can be persuaded to buy the product if they feel it represents a deal that produces the greatest value for their money. According to Gilbert and Jackaria (2002), packs with "buy-one-get-one-free" may not increase brand awareness before trial purchase because the customer will only come across the product once in store (unlike samples or coupons). However, the promotion is noticeable thus facilitating brand recognition and brand recall for future purchases. Since an additional amount is given for free, consumers may be persuaded to buy the product if they feel it represents a fair deal that provides value for money.

Ong, Ho, and Tripp (1997) indicate that consumers appeared to be slightly sceptical of the bonus pack offer, but somewhat more trusting of the price and quantity claimed. In other words, believability of the bonus pack offer was weak. However, they would likely buy one bottle and not buy more than one bottle. This happen because consumers suspect that manufacturers do raise prices slightly in conjunction with bonus pack offerings. Therefore, Ong, Ho, and Tripp suggested to leave a few of the non-bonus packages (old package) on the shelves to facilitate comparisons with the new bonus pack offer in terms of quantities and the prices to persuade consumers to purchase the product and indirectly persuade consumers to try the product.

According to the trial and repeat model mentioned by Thomas (1993), it is generally assume that of all potential buyers in a given time period, only those who are aware of the new product could potentially try it (trial), and only those who try it could potentially buy it again (repeat). Thomas also assumed that the magnitude of planned distribution and promotion expenditures (advertising, sales promotions, sales force, and so on) could affect initial

trial of the brand.

MODEL AND METHOD

There is little question that sales promotions effectively influence consumer behaviour. However, which sales promotion tools are generally most effective for achieving particular behavioural changes is not fully understood. In this study, five consumer promotion tools- coupons, discount, samples, bonus packs, and in-store display are investigated for their impact on consumer purchase behaviour. For example, purchasing a product they had never tried before (product trial). Items from Garretson and Burton (2003) study of consumer proneness towards sales promotion were used in the measurement of proneness to coupon, price discount, free sample, bonus pack, and in-store display, and the trialability behaviour of consumers to sales promotion was measured with items adapted from Gilbert and Jackaria (2002).

Figure 1 shows the research model. Questionnaire was used for the study. The population of the study consists of consumers in Kota Kinabalu, Sabah. The sample points were based upon on supermarket in Kota Kinabalu area. The survey instrument was a self-administered questionnaire that was distributed to the customers, either randomly or through personal networks. Some questionnaire was distribute personally to the existing customers of several supermarket located in the Kota Kinabalu area and administer face to face with respondents to ensure a high response rate, accurate sampling and providing necessary explanations (Oppenheim, 1992, p.103). Some respondents were given a self-administered questionnaire (to be answered at home) with a postage paid return envelope. A five point Likert scale, ranking from strongly disagree (1) to strongly agree (5) was used for the sales promotion and product trial scales. A total of 420 questionnaires were distributed around Kota Kinabalu and only 312 were returned, which represents a response rate of 74%.
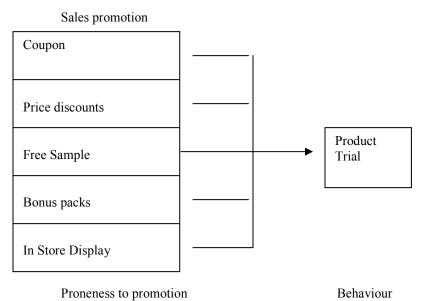
Figure 1: Sales promotion and Consumer Buying Behaviour Framework

ANALYSIS

The data collected for this research was analyse by using Statistical Package for Social Sciences (SPSS) for windows. Multiple regression analysis was used to study the relationship between consumer trial behaviour with sales promotion. The regression assumptions with respect to autocorrelation (independent of residual), normality (residual is normally distributed), homoscedasticity of error terms, multicollinearlity and linearity of independent variables were verified before making any interpretation of the statistical result.

Before the regression results were accepted as valid, the degree of multicollinearity and its effect on the results was examined. The two-part process (condition indices and the decomposition of the coefficient variance) was employed

and comparisons made with the conclusions drawn from the variance inflation factor (VIF) and tolerance values. According to Hair *et al*. (1998) the condition indices and VIF not exceeding threshold values of 30 and 10 respectively are most commonly used. There is no high correlation between the independent variables in the regression as all condition indices and VIF fall below the threshold values. Lastly, there was a check for outliers (i.e. cases falling at the outer ranges of the distribution). A threshold of 3 standard deviations was used, which is appropriate for our sample size (Hair *et al*., 1998) to identify outliers. All observations outside this range (3σ) were considered outliers and were duly dropped from the regression

RESULTS

Reliability Analysis and Descriptive Statistics

Cronbach's alpha test was used to ensure the reliability of the variables. For sales promotional tools, the results indicate acceptable values: coupon (α=0.81), price discount (α= 0.86), free sample (α= 0.87), bonus pack (α=0.88), and in-store display (α= 0.87). The product trial value of Cronbach alpha for product trial is 0.81.

A total of 420 questionnaires were sent to consumers and 312 usable questionnaires were returned by respondents: 138 responses were received from supermarket around Kota Kinabalu, and 174 from personal networks. Analysis of gender revealed that 59.6% of respondents were female, whereas the male respondents consist of 40.4%. The majority of respondents' annual income level was below RM24, 000, which consist of 60.9% of respondents. Most of respondents were Chinese (51.6%). A greater percentage (62.8%) of respondents fall between 20-39 years old. And majority of respondents were non-university graduates (76.6%).

Mean score for all dimensions are as follows: coupon (2.99), price discount (3.67), free sample (3.08), bonus pack (3.28), in-store display (2.84), and product trial (3.22)

Table 1: Descriptive and Reliability Analysis Results

Variables	No. of Items	Mean	SD	Cronbach's Alpha Coefficient
Promotional tools				
Coupon	5	2.99	0.77	0.81
Price Discount	5	3.67	0.75	0.86
Free Sample	5	3.08	0.81	0.87
Bonus Pack	5	3.28	0.77	0.88
In-store Display	4	2.84	0.84	0.87
Product Trial	5	3.22	0.73	0.81

Sales Promotion as Predictor of Product Trial

The multiple regression analysis was employed to test the construct's relationships. Table 2 shows the results of the regression analysis used to determine the relationship between the promotional tools namely, coupon, price discount, free sample, bonus pack, and in-store display in one hand, and product trial in the other.

Table 2: Promotional Tools and Product Trial

Independent variables	Beta coefficients	t-value	p-value
Coupon	.023	0.401	.689
Price discount	.143	2.334	.020
Free sample	.218	3.483	.001
Bonus pack	.114	1.900	.058
In-store display	.234	4.322	.000

Note: R^2 = 0.294   F = 25.218   Sig. F = .000
Coupon, price discount, free sample, bonus pack, and in-store display contribute significantly (F = 25.22; p = .000) and predict approximately 30% of the variations in product trial. The 30% explanation is considered good for a

behavioural science research. The remaining 70% can be explained by other factors. Further examination of the results shows that price discount (t = 2.334; p = .020), free sample (t = 3.483; p = .001), bonus pack (t = 1.900; p = .058), and in-store display (t = 4.322; p = .000) are significantly associated with product trial. The results indicate that In-store display was the strongest predictor of product trial followed by free sample and price discount. Bonus pack was the weakest predictor of product trial.

There is no significant relationship at 5% significance level between coupon and product trial (t=0.401, p=0.689). Therefore, it is conclusive that coupon is not a strong determinant of product trial among the respondents.

DISCUSSION

The results of this study provide some useful information about the impact of five promotional tools on consumer buying behaviour (product trial). With respect to consumer proneness to sales promotions, the study found that in-store display promotion played the most significant role in shaping consumer product trial reaction. This finding can be supported by the view of Percy, Rossiter, and Elliott (2001), display promotions is one of the important parts of an integrated marketing communication programme that leads to better attention and consistent with consumer promotion and advertising, with the same look and feel, in order to increase recognition at the point of purchase (trial). From this finding, it is observable that in-store display is an effective promotional tool, and consumers are more sensitive to the product display. In other words, eye-catching, beautifully, and "easy to take" display in the store have the power to attract consumer to try a product that they have not tried before.

Free sample promotion was also found to significantly impact product trial. This finding is consistent with the definition reported in Pramataris, Vrechopoulos, and Doukidis (2001) that sampling is the activity of offering small quantities of product to consumers for free, in order for them to try it and potentially buy it. Therefore, it can be explained that free sample is one of the important factors influencing consumer buying behaviour, especially in the trial of a new product. However, the findings of the current research is in contrast with Gilbert and Jackaria (2002) and Scott (1976) findings, which found that free sample had no significant effect on consumer buying behaviour and sampling discouraged future purchasing.

From the statistical results, price discount is significant at 5% significance level. It means that price discount play a role in influencing consumer product trial behaviour. The findings are consistent with the views of Blackwell and his colleagues (2001) that price discount is strategically used in various industries to encourage product trial because price discount may reduce consumers' perceived risk associated with trying a new, less-familiar product for the first time. However, other authors have argued that some consumers will only respond to the bargain for a familiar brand (Ehrenberg and Hammond, 1994) and only the 50% discount can have significant effect on product trial (Scott, 1976).

Another sales promotional tool that have significant effect is bonus pack. Consistent with Lee (1963), which reported that bonus pack is used to increase consumer trial of a brand or product, this finding explains that more of the product included at no extra cost, can persuade consumers to buy a product for trial. Although, the significant effect of bonus pack to product trial is lower than other promotional tools such as in-store display, free sample, and price discount, bonus pack remains a useful marketing tool. The reasons why this happen can be explain by the view of Ong, Ho, and Tripp (1997). Ong, Ho, and Tripp stated that consumers might trust the price and quantity discount more than the bonus pack offer. In other words, consumers find it difficult sometimes to believe the bonus pack offered by the manufacturers. This happens because they believe that the price of product with bonus pack is slightly marked up by manufacturers in conjunction with bonus pack offerings. Thus, the only way for bonus pack promotion to encourage consumers product trial is to retain a few of the regular (non-bonus) packages on the shelves to let consumers compare between regular package and new bonus pack offer.

Contrary to what was expected and observed in Banks (2003), Schindler (1998), Blackwell, Miniard and Engel (2001), Robinson and Carmark (1997) where coupon had positive effect on product trial, coupon in this result does not seem to have significant effect on product trial behaviour. This result may have been caused by the fact that the respondents are not well familiar with the use of coupons. In fact in Malaysia, the use of coupons as a promotional strategy is not as common or popular as it is in the West. Marketers in Malaysia very seldom use coupons, resulting in the tool's unpopularity among Malaysian consumers.

Some of the reasons why consumers show very little interest in coupon are: first, the face value of a coupon is not

large. According to Percy, Rossiter, and Elliott (2001), generally, the face value of a coupon is not large because the retail price of the product is not high. Second, the period of redeeming coupon is short. According to Jackson (1996), normally, coupon is nearing its expiration date as a sales promotion technique. Percy, Rossiter, and Elliott stated that only the high value of the coupon and longer period available for redemption could attract consumers to redeem a coupon. Third, consumers in Kota Kinabalu are not familiar with coupon. Unfamiliarity with coupon by Kota Kinabalu consumers has resulted in the tool's failure to become an effective promotional tool to generate product trial. The finding corroborates Gilbert and Jackaria's (2002) findings that coupon didn't play a significant role in encouraging consumer to trial a product that they have not tried before.

IMPLICATIONS OF STUDY

Implications for Practitioners

The reported results have important implications for manufacturers and retailers involved in the elaboration and management of sales promotional tools. One of the major implications of this research is that manufacturers and retailers can increase their sales by offering the right promotional tools to attract customers to buy the product for their first trial. These results suggest that marketing managers need to carefully plan their promotional budgets and allocation of the budget over different forms of promotions. Promotions that emphasize in-store display, free sample, price discount, and bonus pack are likely to be more effective than coupon.

Second, the findings indicate that in-store display proneness has the strongest effect on product trial compared to other sales promotional tools. Attractive in-store display practices are necessary to gain the greatest sales from product trial and repurchase.

Third, bonus pack proneness as shown in the results significantly effect product trial, but the significance level is the lowest among other promotional tools. Thus, one way of improving the determinant power of bonus pack is to keep a regular pack along side with a bonus pack on the shelve, in order to enable consumers to make comparison. Such opportunity for a comparative observation will help to assure them that they are getting real value and no trick is being pulled at them. Consumers' confidence in bonus pack will be enhanced.

Fourth, the findings show that coupon have no significant effect to product trial, probably due to the smaller value of coupon, short period of redeeming the coupon, and unfamiliarity with coupon. Thus, it is suggested manufacturers and retailers use more coupon as their promotional tool, they should also extend the period of redeeming the coupon as well as create greater awareness of the benefits of coupons and how they could be redeemed. So that ignorant customers will be better informed about coupons and their uses.

Implications for Researchers

Understanding the impact of sales promotion on consumer buying behaviour. The Framework provides new insights into the understanding of sales promotional tools and its impact on trial. Why do consumers respond more to in-store display, free sample, price discount, and bonus pack than coupon that offers the same monetary incentive? One explanation may be that coupons require more skill and effort than buying a product on sale. For example keeping the coupon and redeeming it before expiring date, searching for a product that has coupon, matching coupons with brands, etc can be cumbersome and time consuming. In the other hand, price discount, free sample, bonus pack, and in-store display can provide shopping convenience benefit. Therefore, price discount, free sample, bonus pack, and in-store display promotion are more clearly signals the smart-shopping skills and values of the consumers. Researchers may wish to explore the reasons why coupon is not a product trial facilitator in Malaysia.

LIMITATIONS AND FUTURE RESEARCH

Although this study has provided an initial base for understanding sales promotional tools and their impact on product trial, there are few limitations to this study. First, product category or brand level was not included in the study. For example, a customer may be prone to a coupon promotion but they may not use the coupon to try all the different product. Moreover, various drivers (sales promotional tools) of trial may differ based on product type, for example consumer durables and services. Therefore, it is recommended to use different products and subjects in

future investigations in order to see if the observed effects can be generalized across product categories.

Second, unequal weighting of age and race of respondents is one of the limitations for this study. Most of the respondent in this study come from the age group between 20 to 39 years old. And almost 50% of them are Chinese. Unequally distribution of age and race could affect the result of this study. Therefore, the result probably cannot be used to generalize on the entire Kota Kinabalu consumers. It is suggested that sample distribution be improved in future research in this area.

There is still an urgent need to investigate the impact of promotional tools on product trial because research in this area is still inconclusive. Therefore, in spite of five specific types of deals (i.e., coupon, price discount, free sample, bonus pack, and in-store display) that was examined in this study, future research may choose to examine other types of sales promotions (e.g., contests, refund) on product trial.

In addition, studies that utilize data compiled by retailers that track buying and sales promotion participation habits across various types of deals could extend this study findings.

CONCLUSION

The findings of this study reveal that proneness to price discount, free sample, bonus pack, and in-store display positively impact product trial. The findings clearly indicate that sales promotion is an effective way to consummate product trial. It can also help to get a second chance at first time product buyers if promotion is continued.

Coupon is not a very popular promotional strategy in Kota Kinabalu. More awareness is needed in order for coupon to make any significant impact. Stores should display products attractively because in-store display promotion is an effective promotional tool in Kota Kinabalu. These issues are very important to practitioners and researchers interested in understanding the power of sales promotion as a viable marketing strategy.

REFERENCES

Advertising Age. (1988). Boy try to save folks some change. *Advertising Age*. **59** (20): 27.
Banks, P. (2003). Store was set to rage on. *Irelands Marketing Monthly*. Online, available at www.marketing.ie/sep03/article4.htm
Bawa, K. & Shoemaker, R.W. (1987). The effects of a direct mail coupon on brand choice behavior. *Journal of Marketing Research*. **24**: 370-6
Bawa, K. & Shoemaker, R.W. (1989). Analyzing Incremental Sales from a Direct Mail Coupon Promotion.*Journal of Marketing*. **53** (3): 66-76
Blackwell, R.D., Miniard, P.W., & Engel, J.F. (2001). *Consumer Behavior*, 9th Edition. Fort Worth, TX: Harcourt College Publishers.
Blattberg, R.C. & Neslin, S.A. (1990). *Sales Promotion: Concepts, Methods, and Strategies*. N.J.: Prentice Hall.
Brandweek. (1994). Promotional influence spurs buyers to try something new. *Brandweek*. **35** (12): 32-34.
Chandon, P., Laurent, G., & Wansink, B. (2000). A Benefit Congruency Framework of Sales Promotion Effectiveness. *Journal of Marketing*. **64** (4): 65-81.
Cheong, K.J. (1993). Observations: are cents-off coupons effective? *Journal of Advertising Research*. **33** (2): 73-78.
Cook, A. (2003). How to cash in on the coupon craze. *Incentive Business*. Jun/Jul: 3.
Ehrenberg, A.S.C., Hammond, K. & Goodhardt, G.J.(1994). The after-effects of price related consumer promotions. *Journal of Advertising Research*. **34** (4): 11-21.
Fill, C. (2002). *Marketing Communications: Contexts, Strategies and Applications*, 3rd Edition. Italy: Pearson Education Limited.
Gardener, E. & Trivedi, M. (1998). A communication framework to evaluate sale promotion strategies. *Journal of Advertising Research*. **38** (3): 67-71
Garretson, J.A., &Burton, S. (2003). Highly Coupon and Sale Prone Consumers: Benefits Beyond Price Savings. *Journal of Advertising Research*. **43** (2): 162-172
Gilbert, D.C. & Jackaria, N. (2002). The Efficacy of Sales Promotions in UK Supermarkets: A Consumer View. *International Journal of Retail & Distribution Management*. **30** (6): 315-322.
Gupta, S. (1988). Impact of sales promotions on when, what, and how much to buy. *Journal of Marketing Research*. **25**: 342-55

Hair, J.F. Jr., Anderson, R.E., Tatham, R.L. & Black, W.C. (1998). *Multivariate Data Analysis*. 5th Edition. New Jersey: Prentice Hall, Inc.

Huff, L.C., & Alden, D.L. (1998). An Investigation of Consumer Response to Sales Promotions in Developing Markets: A Three Country Analysis. *Journal of Advertising Research*. **38** (3): 47-56

Jackson, R. (1996). The goods on packaged goods. *Direct*. **8** (2): 769

Kardes, F.R. (1999). *Consumer Behavior: Managerial Decision Making*. New York: Addison Wesley Longman.

Kotler, P., Ang, S.H., Leong, S.M., Tan, C.T., (1999). Marketing Management: An Asian Perspective, 2nd Edition. Singapore: Prentice-Hall

Lee Adler, (1963). Sales Promotion Effectiveness Can Be Measured. *Journal of Marketing*. **27** (4): 69-70.

Leone, R.P. & Srinivasan, S.S. (1996). Coupon Face Value: Its Impact on Coupon Redemptions, Brand sales, and Brand Profitability. *Journal of Retailing*. **73 (**3): 273-89

Nations' Restaurant News. (1985). Coupon: necessary evil or effective vehicle? in Kendrick, A. (Eds.). Prmotonal products versus price promotion in fostering customer loyalty: a report of 2 controlled field experiments. *Journal of Services Marketing*. **12** (4): 312-326

Ong, B.S., Ho, F.N. & Tripp, C. (1997). Consumer perceptions of bonus packs: an exploratory analysis. *Journal of Consumer Marketing*. **14** (2): 102-112.

Oppenheim, A. (1992). *Questionnaire, Design, Interviewing and Attitude Measurement*, in Gilbert, D.C. & Jackaria, N. (Eds.). The Efficacy of Sales Promotions in UK Supermarkets: A Consumer View. *International Journal of Retail & Distribution Management*. **30** (6): 315-322.

Percy, L., Rossiter, J.R., & Elliott, R. (2001). *Promotion Tactics*. Strategic Advertising Management. Oxford University Press.

Peter, J.P. & Olson, J.C. (1996). *Consumer Behavior and Marketing Strategy*, 4th Edition. N.Y.: Irwin

Pramatataris, K.C., Vrechopoulos, A.P.,& Doukidis, G.I.(2001). The transformation of the promotion mix in the virtual retail environment: An initial framework and comparative study. Online, available at www.eltrun.aueb.gr/papers/iec.htm

Press Releases, (2003). Promotion Marketing Association Coupon Council Introduces the Coupon Handbook: A Marketer's Guide to Effective Couponing. *Press Releases*, 7/8/2003 Online, available at www.pmalink.org.

Robinson, William A., & Carmack, Lynne L. (1997). *Best Sales Promotions*, 6th Volume. N.Y.: NTC Business Books.

Schindler, R.M. (1998). Consequences of perceiving oneself as responsible for obtaining a discount: evidence for smart-shopper feelings. *Journal of Consumer Psychology*. **7** (4): 371-392

Scott, C.A. (1976). The effects of trial and incentives on repeat purchase behavior. *Journal of Marketing Research*. **13**: 263-9.

Seibert, L.J. (1996). Are bonus packs profitable for retailers? *Chain Store Age*. **72** (12): 116-118

Seibert, L.J. (1997). What consumers think about bonus pack sales promotions. *Marketing News*. **31** (4): 9-2/5p

Shimp, T.erence A. (2003). *Advertising, Promotion, and Supplemental Aspects of Integrated Marketing Communications*. Sixth Edition. United States of America: Thomson South-Western.

Thomas, R.J. (1993). *New Product Development: Managing and Forecasting for Strategic Success*. U.S.A: John Wiley & Sons, Inc.

Totten, John C., & Block, Martin P. (1994). *Analyzing Sales Promotion Text & Cases: How to Profit from the New Power of Promotion Marketing*, 2nd Edition. U.S.A.: The Dartnell Corporation.

Wayne, M. (2002). Hitting your target with direct mail coupons. *Marketing Magazine*. **107** (22): 19-1/2p

Application of Importance-Performance Analysis (IPA) to Formulate Customer Satisfaction Strategies in the Direct Sales Industry: A Comparison of Stated-Importance versus Derived-Importance Approaches

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ABSTRACT

Compelling evidence expounds that in the effort to improve business performance; customer satisfaction should be measured and managed. In fact, the new ISO 9000 revision requires firms to collect and act on their customer satisfaction data. Despite its undoubted importance, the attempt to understand what makes customers satisfied remains a difficult task, and this presents a key challenge and is a critical management issue today. Additionally, customer satisfaction findings were often criticised of being difficult to translate into managerial action. In light of these considerations, the present study aims to develop and formulate marketing strategies by utilising the Importance–Performance Analysis (IPA). IPA is an easy-to-use analytical technique that offers prescriptions for the management of customer satisfaction. However, it has been argued that there are two approaches in measuring importance of attributes: stated and derived. Therefore, our study sets out to compare the customer satisfaction ratings based on these two approaches. In contrast to the traditional IPA, our analysis was based on indicators that were established through rigorous assessment of exploratory factory analysis and purified via confirmatory factor analysis. Consumption behaviour of 400 direct sales channel customers in Malaysia was analysed. The results have important implications for future research directions and management practise.

INTRODUCTION

Accumulated research evidence has established that satisfaction may be a means to strategic ends; such as customer loyalty and customer retention, that directly affects company's profits (Bernhardt et al. 2000; Burnham et al. 2003; Jones and Sasser 1995; Shun et al. 2004; Zeithaml 2000). In view of this, it comes as no surprise that customer satisfaction has received much attention in the marketing literature and is the primary focus of our research endeavour. Whilst there has been resurgent interest in this research area, the critical issue of identifying the key factors that drive customer satisfaction has not been an easy task, specifically to the practitioners. Customer satisfaction findings particularly from the academic community have been criticised for being operationally irrelevant and difficult to be translated into managerial actions (Piercy 2002; Westbrook 1997, 2000; Woodruff 1993). In a similar voice, Petterson and Spreng (1997) assert that considerable research has focused on modelling the influence of perceived performance on satisfaction at the aggregate construct level; examining the effect of individual attribute performance on satisfaction judgement is more useful as it provides more diagnostic and actionable decisions for practising manager (Roszkowski 2003; Yuksel and Rimmington 1998). Accordingly, Westbrook (1997) suggests that to improve customer satisfaction measurement, research should address specific product or service features/dimensions and demonstrate how the key attributes are associated with overall customer satisfaction.

The purpose of a customer satisfaction study is not limited to identifying the key drivers of customer satisfaction and examining the actual satisfaction level experienced by customers, but also must extend to discovering the product or service attributes' strength and which require improvement (Ching 2003). Unquestionably, through this continuous improvement effort organisations may improve customer satisfaction evaluations and, ultimately, their bottom lines (Zeithaml 2000). Several scholars advocate that firms should embark on improvement actions on attributes that customers judge important though experienced lower satisfaction levels. In doing so, it helps the firms to make a more precise decision and deploy their scarce resources to achieve the optimum level of customer satisfaction. In an effort to identify and examine the attributes implicitly, Importance-Performance Analysis (hereafter IPA) has been recommended by several researchers as the most appropriate analytical technique (Johnson and Gustafsson 2000; Martilla and James 1977).

Although IPA could provide guidance for actionable plans in managing resources and infers priority area of improvement (Bacon 2003; Chu 2002), and has been suggested as the most applicable analytical tool to the practitioners, it is not without criticism. The critical issue often highlighted is that IPA is very sensitive to the importance measure employed. It was revealed that the items included in the final analysis and their interplay on the IPA grid depend on whether the customers' self stated judgement (stated importance) or some form of derived measurement was used (Chu 2002; Matzler et al. 2003). Typically, IPA uses direct ratings of importance known as 'stated importance' (e.g. importance rated on a 5 or 7-point scale anchored at 'not at all important' and 'extremely important'). On the other hand, others have strongly argued that indirect measures (derived importance) such as regression coefficients (beta values) (Bacon 2003; Chu 2002; Dolinsky 1991; Johnson and Gustafsson 2000) or correlation coefficients (Matzler et al. 2003) should be used to estimate the importance of attributes. Another shortcoming of IPA is that a slight change in an attribute's position in the grid might lead to a major change in its inferred priority and managerial actions direction (Bacon 2003).

In this sense, it is no surprise that issues such as how and why direct and derived methods may differ has long been debated and are major concern among several authors (Bacon 2003; Oh 2001; Matzler et al. 2003). Indeed, the validity of IPA as a managerial analytical tool has been frequently questioned (Bacon 2003; Oh 2001; Matzler et al. 2003). Recognising the aforementioned drawbacks and unresolved disagreements associated with the classical IPA, which primarily relies on the stated importance, clearly, it needs to be further validated, and modified or an alternative approach should be proposed.

RESEARCH OBJECTIVE

The primary purpose of our paper is sets out to compare the importance ratings and rankings of the two importance measurements (stated and derived approach), and demonstrate the critical differences when the key attributes are visually plotted on the IPA grids. Specifically, two derived importance methods will be utilised in this investigation, multiple regression (beta values) and correlation (coefficients). Importantly, we aim to illustrate visually how inferences made from the points plotted in the quadrant model across three methods employed for estimating attributes importance might yield different interpretations and strategies. Ultimately, an alternative approach to IPA, which is considered more rigorous is identified and proposed, which could be used by the direct sales practitioners with more confidence.

KEY CONTRIBUTIONS

While IPA has been frequently employed in previous studies, it is important to note that our empirical investigation is the first to utilise indicators (items) in the measures which have been purified through rigorous items analysis and subsequently by exploratory factor analysis (Churchill 1979). The measures were further refined by confirmatory factor analysis (Gerbing and Anderson 1988). Hence, this approach distinctively differentiates our IPA model from the prior studies. This approach is also in response to frequent calls made by prior researchers for IPA to use reliable measures and large samples in order to achieve consistent results (see, for example, Bacon 2003; Oh 2001; Roszkowski 2003).

Even though IPA has been used in various research contexts (notably education, leisure and tourism, health care sectors), to the best of our knowledge, this is the first time it has been used to examine customer satisfaction with the direct sales channel. What is more, we incorporate three interactive dimensions that constitute the direct sales marketing system (product, direct seller and direct selling company) in one IPA quadrant chart.

IMPORTANCE-PERFORMANCE ANALYSIS (IPA)

Business leaders have recognised the significance of business strategy to a firm's success across most industries (Robbins 2002). According to Barsky and Labagh (1992 p.32) "*despite the attention already given to customer satisfaction and strategic planning, each develop separately*". They further assert that strategic planning has not focused directly on customer satisfaction and similarly customer satisfaction does not have a strategic dimension. The practitioners require tools that could bring clarity to decision-making and problem solving. However, it appears that their efforts were bogged down by the lack of clear guidance on where to focus the attentions and efforts in allocating their limited resources. It has been widely acknowledged that IPA could fill this gap (Bacon 2003; Martilla and James 1977; Matzler et al. 2003). IPA has been a popular tool for providing richer insights into customer satisfaction and one that could afford suggestions to management for specific areas of improvement. More importantly, IPA is a practical and easy to-use tool for managers pressed for time.

Martilla and James (1977) first advocated this simple analytical technique, and over the years, many modifications and variations of IPA have emerged (Bacon 2003; Matzler et al. 2003). Traditionally, this analysis was based on perceived importance and attribute performance ratings evaluated by respondents, of which no statistical manipulation has been conducted. It has been consistently reported in previous research that customer satisfaction is a function of both consumer expectations related to importance attributes and perceived performance (e.g. Oliver 1980; Parasuraman et al. 1988). Interestingly, IPA is a simple yet useful tool that is capable of visually depicting the customer priorities (importance) against performance evaluation. The information derived from this analysis supports common managerial decisions. For example, IPA quadrant chart could yield a better understanding of customer satisfaction, identifying and prioritising critical area of improvements and provides guidance for action plans in allocating the firms' resources (Bacon 2003; Chu 2002; Lambert et al. 1997; Oh 2001).

IPA is a two-dimensional matrix (grid), which illustrate the perceived performance (satisfaction) along the x-axis and importance along y-axis. The grid is then subdivided into four quadrants by drawing a vertical line at the mean of the overall performance score and the mean of overall 'importance' displayed by the horizontal line (see Figure 1) and this yields four different strategies. The scaling and plotting of points in the quadrant model is crucial in IPA because the interpretation and inferences of results depends on them. It is worth noting that Martilla and James (1977) assert that the vertical and horizontal axes on the grid are a matter of judgement; the placement of these axes is considered a relative rather than absolute level of importance and performance. It was observed by Bacon (2003) that in some applications the point where the quadrant grid lines cross (cross-point) is positioned at the centre of the scale used (e.g. for 5-point scale the cross point is set at 3) and alternatively, in some cases the cross point is set at the centre of the data (mean value). However, recently Bacon (2003) provides empirical evidence that the data-centred quadrant predicts priorities for improvement better than scale-centred quadrant model.

Figure 1: Importance–Performance Analysis

Quadrant II High Importance/ Low performance **CONCENTRATE HERE**	Quadrant I High Importance/ High Performance **KEEP UP THE GOOD WORK**
Quadrant III Low Importance/ Low Performance **LOW PRIORITY**	Quadrant IV Low Importance / High Performance **POSSIBLE OVERKILL**

Source: Adapted from Mantilla and James (1977)

The position of a plot on the grid indicates the appropriate strategy to each product or service attribute investigated: '*Concentrate Here*', '*Keep Up the Good Work*', '*Possible Overkill*', and '*Low Priority*'. The following are the interpretations of zones in the quadrant chart:

Quadrant I: Keep Up the Good Work:
The attributes located in this zone according to customers are important and the performance is also satisfactory. This portion of the chart is also representing opportunities for gaining or maintaining competitive advantages (Barsky and Labagh 1992). This suggests that manager should maintain the superior evaluation and further exploit its competitive potential. Industry practitioners should perhaps continue to invest their effort and resources on such attributes.

Quadrant II: Concentrate Here:
The attributes that fall in this zone are considered importance by customers yet they do not perform well. According to Barsky and Labagh (1992), this zone is critical to gaining market share and this attribute can be shifted to 'critical strength' if resources can be reallocated from less important attributes. In essence, in order to enhance overall satisfaction, direct sales company should focus on these attributes and it is believed that if they are ignored, this might cause severe problems (Matzler et al. 2003).

Quadrant III: Low Priority:
The attributes located in this grid are deemed not important and the levels of performance are assessed being low. It suggests that although performance levels may be low, management should not give much priority to improving the attributes that fall into this quadrant as they are perceived to be not important, and obviously have less influenced on satisfaction evaluations.

Quadrant IV: Possible Overkill:
The attributes that fall into this grid are assessed by customers as not important yet they are reported to perform relatively well. This implies that managers should consider the present efforts on these attributes as being superfluous—this is a waste of resources. Therefore, if company needs to cut costs, these are the areas in which cuts could be made and should consider allocating some of these resources elsewhere (i.e., the 'concentrate here' quadrant).

STATED IMPORTANCE VERSUS DERIVED IMPORTANCE

Stated Importance:

The advantage of incorporating direct measure of performance from the customers' lens is that it provides insightful information as the level of importance of individual attributes is reported together with the perceived performance scores. For example, in one case study on student satisfaction, it was revealed that even though the quality of food service was frequently indicated as area of dissatisfaction for students. However, when requested to indicate the importance of this particular attribute to their overall educational experience, students rate food service relatively low (cf. Roszkowski 2003). This evidence strongly strengthens the argument of integrating the measurement of importance in customer satisfaction study. Furthermore, by measuring both performance and importance evaluation simultaneously, satisfaction gap scores can be derived by subtracting performance rating from importance rating. The gap is purported to imply how well the company or organisation performs relative to customers' importance evaluation on the specific attribute/dimension. The larger the gap, the poorer the performance as perceived by the customers (Bacon 2003; Roszkowski 2003).

Despite it is intuitively desirable to incorporate direct (self-stated) measure of importance in satisfaction measurement, several shortcomings have been observed. For example, it has been criticised for being a measure that reflects a social desirability and has been noted to be rated uniformly high as respondents might be unable to discriminate the degree of importance of the attributes examined, particularly when it involves a large range of attributes (Rao and Kelkar 1997). It was suspected that the self-stated approach did not adequately measured attributes based on customers satisfaction levels, rather were rated relative to each other (Matzler et al. 2003) and lacks of statistical significance testing of the scales used (Chu 2002; Duke and Mount 1996). Furthermore, the inclusion of importance ratings in the satisfaction research instrument will increase the burden for the respondent and several authors argue that stated importance might not be what actually drives consumer behaviour (Roszkowski 2003). What is more, relying on gap scores might pose some statistical problems (see, for example, Cronin and Taylor 1992).

Derived Importance:

Derived-importance approach applies the statistical mechanism such as regression and correlation analysis thus it is objective by avoiding human bias and it is possible to determine statistical significance of the attributes examined (Chu 2002). Furthermore, it requires only the performance ratings, thus inclusion of importance ratings are unnecessary (Chu 2002; Roszkowski 2003). The application of indirect techniques such as correlation analysis, assumed that the observed correlations reflect causal relationships. For example, significant correlation coefficient of individual attribute score against its dependent variable (i.e. overall performance/satisfaction) ratings indicates that the attribute is important. Whereas to compute the importance measures using multiple regression, the performance scores of each attribute is regressed against the overall performance ratings. The importance (i.e. magnitude of impact) of the attributes is determined by their corresponding standardised regression coefficients values (Hayes 1998; Mittal et al. 1999). A higher value implies that the specific attribute is an important predictor to overall performance/satisfaction.

Even though the 'derived importance' method is probably not distorted by the same biases as direct measures, it may be distorted when the assumptions underlying their statistical models are violated (Bacon 2003). However, Green et al. (1981) postulate that both types of measures of importance can predict product preferences. In addition, they provide evidence that the social desirability bias in direct measures of importance was not significant.

RESEARCH METHODOLOGY

The data utilised for the current investigation were collected in Malaysia by using self-administered questionnaires distributed via the 'drop off and collect' technique. The target population criteria for this study were adult consumers (over 16 years of age) who have purchased beauty or healthcare products from the direct

seller[1] within the twelve months prior to the data collection period (May – June 2002), and who live or work within the selected geographic locations; in this case three designated districts (Petaling, Kelang and the Federal Territory of Kuala Lumpur). A sample of 400 survey respondents was obtained based on a quota sampling technique. The ratio of men to women in the sample was set at 1:3, based on several empirical studies conducted in Malaysia and other countries suggesting women make up a significantly larger percentage of purchasers through the direct sales channel than men (Chen et al. 1998b; Endut 1999; Sargeant and Msweli 1999) and moreover the specific product categories under study (beauty care and healthcare) have more direct appeal to women. It should be noted that the current investigation is based on transaction specific approach rather than global (overall) experience.

Initially, 34 items were assessed individually to determine the relative importance and perceived performance respondents attached to these. Specifically, the informants were asked to rate the importance of the items (attributes) in fulfilling their satisfaction, while in the performance measurement respondents were requested to indicate their level of satisfaction with the items (attributes). Performance evaluation employed a 5-point satisfaction-dissatisfaction scale anchored with (1) "very dissatisfied", (2) "dissatisfied", (3) "neutral", (4) "satisfy" and (5) "very satisfied" and "not applicable". The importance rating is measured on a 5-point scale anchored with (1) "not at all important", (2) "not important", (3) "neutral (indifferent)", (4) "important", (5) "very important". The IPA grids are visually displayed in the form quadrant chart for each aspect of the direct sales marketing channel system. Table 1 exhibits the original pool of items used in the study before they are assess for unidimensionality, reliability and validity.

Table 1: Original Pool of Items

Product Satisfaction	Direct Seller Satisfaction	Company Satisfaction
1 Price of product	1 Knowledge of products and services	1 Reliable and trustworthy
2 Product performed as claimed	2 Capable and competent	2 Enquiry service responsiveness
3 Product is multifunctional	3 Being consistently courteous	3 Company's reputation
4 Product packaging	4 Following through on his/her promise	4 Sales campaigns / promotion
5 Effectiveness of product	5 Provide payment flexibility (instalment)	5 Corporate information / publicity
6 Product guarantee	6 Trustworthy	6 Handle complaints promptly
7 Product choice/variety	7 After sales service	7 Concern about customers
8 Product availability	8 Giving personal advice and attention	8 Company's popularity
9 Product information adequacy	9 Continuity of contact	9 Reasonable service charge
10 Product catalogue / brochure	10 Availability of direct seller	10 Product return/adjustment policy
11 Innovative and unique product	11 Maintain a professional appearance	
	12 Have customer interest at heart	
	13 Effectiveness of sales demonstration	

The pool of 34 items for performance measurement were assessed for item-total correlations and purified using exploratory factor analysis and subsequently validated using confirmatory factor analysis (structural equation modelling technique via AMOS 4 programme). The item-to-total correlation scores were in the range of 0.35 to 0.67, which signifies a reasonably good item performance. Exploratory factor analysis (hereafter, EFA) with Varimax rotation was first used to identify the underlying dimensions of the 34 items. Items that had high loadings (greater than 0.5) on a single factor and did not have cross-loadings greater than 0.3 (Rentz et al. 2002) on multiple factors were retained for further analysis. This initial purification exercise resulted in the deletion of ten items on the basis of failing to fulfil the criteria aforementioned. EFA on the remaining performance items was performed again and item-to-total correlations and Cronbach's alpha were computed for each factor extracted from this second run (Churchill 1991; Hair et al. 1998). All items loaded appropriately on the expected dimensions, which were: Product satisfaction, Direct seller satisfaction and Direct sales company satisfaction. The measures yielded a reliability coefficient (Cronbach's alpha) ranging from 0.80 to 0.88, which is greater than the recommended threshold of 0.70 (Nunnaly 1978).

It is widely recognised that more robust statistical tests such as confirmatory factor analysis (CFA) should be employed to confirm and verify the dimensions underlying the factors derived from EFA (Gerbing and Anderson 1988). Parallel to this suggestion, CFA was performed on the remaining 24 items using structural equation modelling and this resulted in a deletion of three more items. The estimation of the measurement model yielded respectable Goodness-of-Fit Index (0.91), Comparative Fit Index (0.93) and Incremental Fit Index (0.93) values. The Root Mean Square Residuals value of 0.03 confirmed a good fit, which exceeded the posited cut-off value (<0.05). The Root Mean Square Error of Approximation value of 0.06 was satisfactory. Overall, the results of the fit indices indicate that the measurement model adequately fits the data. Hence, it is

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[1] Direct sellers, sometimes referred to as distributors or direct salespeople, are independent representatives of a direct selling company who have the right to sell and facilitate the distribution of the product to the end consumers

reasonable to believe that the measures utilised in our analysis have adequately met the unidimensionality, validity and reliability criteria applied[2].

Subsequently, the remaining 21 items were regressed against their respective criterion (dependent) variables, for instance indicators for product performance were regressed against product satisfaction (i.e. overall product performance) (Oliver 1997; Mittal et al. 1999). The same procedure applies to direct seller satisfaction and direct selling company satisfaction. Significant beta coefficient regression values derived for individual attributes and dimensions imply their 'importance'. In addition, correlation analysis was conducted on each attribute in order to delineate the relationships of these variables on overall performance, such as overall product performance (product satisfaction). Again a significant correlation coefficient would imply that the attribute is associated with satisfaction, thus, the attribute is important (Bacon 2003).

RESULTS AND DISCUSSIONS

The initial analysis performed was that of assessing the attributes performance and degree of importance and subsequently the satisfaction gaps were computed (performance mean values minus stated importance mean values). In order to illustrate the differences between self-stated and derived importance, the rankings of attributes were compared. We compare importance rating and ranking of individual attribute, which were assessed by self-stated approach and two derived importance assessment methods (multiple regression and correlation analysis). Table 2 displays the summarised results of the analysis. The results of the comparison of ratings, rankings and satisfaction gap across the three methods are organised according to the dimensions of direct sales channel.

Table 2: Summarised Results Of Performance Mean And Mean Differences, Stated Importance And Derived Importance

Items/ Factors	(A) Performance mean	(B) Stated importance Mean	C (A – B) Mean Differences	Derived Importance Regression Weight (Beta)	Correlation Coefficient
Product Satisfaction α = 0.80	3.77	4.12	-0.35	0.22	0.42
1. Effectiveness of product	3.78	4.32 (1)	-0.55	0.31 (1)	0.55 (1)
2. Product guarantee	3.66	4.24 (2)	-0.58	NS	0.38 (4)
3. Product information adequacy	3.86	4.17 (3)	-0.31	NS	0.35 (6)
4. Product performed as claimed	3.67	4.16 (4)	-0.49	0.20 (3)	0.53 (2)
5. Product catalogue / brochure	4.00	4.02 (5)	-0.02	0.12 (4)	0.33 (7)
6. Innovative and unique product	3.72	3.97 (6)	-0.25	0.23 (2)	0.45 (3)
7. Product is multifunctional/multipurpose	3.67	3.94 (7)	-0.25	NS	0.37 (5)
Direct Seller Satisfaction α = 0.88	3.68	4.05	-0.37	0.15	0.54
8. Knowledge of products and services	3.81	4.21 (1)	-0.40	0.19 (2)	0.55 (4)
9. Have customer interest at heart	3.59	4.09 (2)	-0.50	0.12 (3)	0.56 (3)
10. Being consistently courteous	3.78	4.08 (3)	-0.30	0.08 (6)	0.51 (6)
11. Availability of direct seller	3.68	4.07 (4)	-0.39	0.10 (5)	0.53 (5)
12. Giving personal advice and attention	3.64	4.05 (5)	-0.41	NS	0.48 (8)
13. Effectiveness of sales demonstration	3.67	4.02 (6)	-0.35	0.30 (1)	0.61 (1)
14. Maintaining a professional appearance	3.65	3.85 (7)	-0.30	0.11 (4)	0.58 (2)
15. Continuity of contact	3.59	3.92 (8)	-0.33	NS	0.50 (7)
Company Satisfaction α = 0.84	3.66	4.09	-0.43	0.21	0.52
16. Company's reputation	3.94	4.19 (1)	-0.25	0.17 (3)	0.45 (6)
17. Concern about customers	3.65	4.18 (2)	-0.53	0.29 (1)	0.59 (1)
18. Handle complaints promptly	3.44	4.12 (3)	-0.68	NS	0.51 (3)
19. Product return/adjustment policy	3.59	4.08 (4)	-0.49	0.24 (2)	0.55 (2)
20. Sales campaigns / promotion)	3.71	3.99 (5)	-0.28	NS	0.47 (5)
21. Corporate information / publicity	3.63	3.98 (6)	-0.34	0.13 (4)	0.49 (4)
Overall Satisfaction	3.70	4.09	-0.39	0.19	0.50

Note: The numbers in parentheses represent individual item ranking based on the dimension level
NS denotes not significant at 0.05 significant levels

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[2] Due to space constraint, these analysis procedures are not discussed

Product Dimension

Generally, the mean values of the product attributes (items) importance are higher compared to the mean values of performance. It is revealed that 'product effectiveness' was the most important attribute for product aspect (3.78). The largest gap between 'importance' and 'performance' mean values is product guarantee (0.58). This finding indicates that the direct sales company should improve on this attribute if they desire to increase customer satisfaction with their products.

With respect to importance rating by the stated importance method, the results indicate that item 1 (effectiveness of product) is the most important product attribute and was further supported by both derived methods, which are multiple regression and correlations. The critical differences are: Item 2 (product guarantee), item 3 (product information adequacy) and item 7 (product is multifunctional /multipurpose) were revealed to be insignificant predictors of product satisfaction when assessed by regression analysis. Interestingly, item 6 (innovative and unique product) is of low importance (6th of 7) when assessed by stated importance approach but in contrast was rated highly important when computed by regression (2nd of 7) and correlation method (3rd of 7).

Direct Seller Dimension

Table 2 suggests that the attributes of the direct seller dimension perceived by the customers fall short of the mean of 'importance' scores. It is unveiled that direct seller 'knowledge of products and services' was the most important attribute by self-stated method, and it was rated the highest in term of performance evaluation (3.81). Item 9 (have customer interest at heart) had the largest gap between 'importance' and 'performance' score (0.50). Therefore, this suggests that the direct sellers should improve on this attribute, perhaps by demonstrating their concerns and commitment to their customers.

Relying on the derived importance technique (multiple regression and correlations), item 13 (effectiveness of sales demonstration) was ranked the most important attribute of the direct seller satisfaction (1st of 8). Conversely, this specific item was ranked low in importance by stated importance approach (6th of 8). Item 12 (giving personal advice and attention) and item 15 (continuity of contact) were found to be insignificant driver of direct seller satisfaction by multiple regression analysis. It is worth noting that this item was ranked lowest in terms of importance by direct rating approach (8th of 8) and by correlation analysis (7th of 8).

Direct Sales Company Dimension

The results presented in Table 2 illustrate that the direct selling company dimension in terms of importance held in highest regard by the respondents is company's reputation (4.19) and ranked the highest in terms of performance (3.94). The largest gap between 'importance' and 'performance' score was item 18 (handle complaint promptly) (0.68). This implies that the direct selling organisations could improve their customer satisfaction by narrowing the gaps of this attribute if they are to retain their customers. Otherwise, their customers could switch to other companies, of which there are reported to be over 350 in the market currently (Ministry of Domestic Trades and Consumer Affairs of Malaysia Report, 2001).

Item 16 (company's reputation) had the highest rating of importance (1st of 6) by direct rating approach (stated); however it drops to 3rd and 6th rank by regression and correlation techniques respectively. Interestingly item 18 (handle complaints promptly) was ranked 3rd in term of importance by both stated and correlation methods, but was revealed to be insignificant by multiple regression. Additionally, item 20 (sales campaigns / promotion) was ranked relatively low in term of importance (5th of 6) by both stated and correlation methods and it was unveiled to be insignificant predictor of direct sales company satisfaction via multiple regression analysis. Interestingly, item 17 (concern about customers) was ranked the highest in terms of importance by both regression and correlation analysis and was ranked second by direct rating. The results imply that across three methods of assessing attributes importance, 'concern about customer' was rated relatively consistent.

In summary, the results demonstrate that the ratings and rankings of attributes (items) examined in this investigation were largely determined by the methods utilised to measure the attributes' importance.

Importance-Performance Analysis Results

Figure 2, 3 and 4 illustrate an importance – performance chart (grid), which was used to highlight and demonstrate clearly the four classifications of strategies. More importantly, in this section we will demonstrate that the outcome of an IPA is very sensitive to the assessment of attributes importance method employed. Figure

2 exhibits the IPA using the direct rating scale as a measure for attribute importance. The mean values for overall importance (4.09) and overall satisfaction (3.70) were used to split the axes, this produced four strategies. The summarised results of the IPA are illustrated in Table 3.
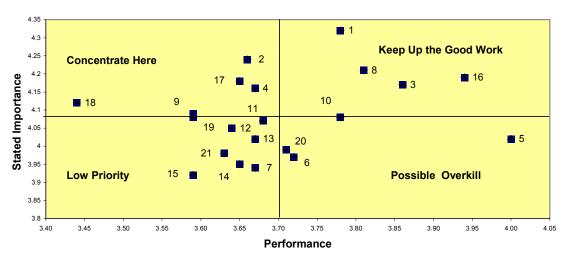
Figure 2: Quadrant Chart based on Stated Importance

Product Satisfaction	Direct Seller Satisfaction	Company Satisfaction
1. Effectiveness of product 2. Product guarantee * 3. Product information adequacy * 4. Product performed as claimed 5. Product catalogue 6. Innovative and unique product 7. Product is multifunctional/ multipurpose *	8. Knowledge of products and services 9. Have customer interest at heart 10. Being consistently courteous 11. Availability of direct seller 12. Giving personal advice and attention * 13. Effectiveness of sales demonstration 14. Maintaining a professional appearance 15. Continuity of contact *	16. Company's reputation 17. Concern about customers 18. Handle complaints promptly * 19. Product return/adjustment policy 20. Sales campaigns / promotion * 21. Corporate information / publicity

Note: * item non-significant at the 0.05 level

Figure 3 portrays a quadrant chart which is based on the multiple regression analysis in the assessment of the attributes importance. Whilst Figure 4 depicts a quadrant chart derived from attribute importance via correlation analysis. The summarised results of the analysis of the IPA are exhibited in Table 3. The discussion on the IPA results is illustrated and interpreted with regards to four classifications of strategies.
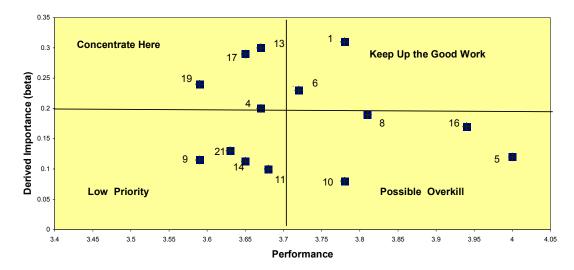
Figure 3: Quadrant Chart based on Multiple Regression

Product Satisfaction	Direct Seller Satisfaction	Company Satisfaction
1. Effectiveness of product 2. Product guarantee * 3. Product information adequacy * 4. Product performed as claimed 5. Product catalogue 6. Innovative and unique product 7. Product is multifunctional/ multipurpose *	8. Knowledge of products and services 9. Have customer interest at heart 10. Being consistently courteous 11. Availability of direct seller 12. Giving personal advice and attention * 13. Effectiveness of sales demonstration 14. Maintaining a professional appearance 15. Continuity of contact *	16. Company's reputation 17. Concern about customers 18. Handle complaints promptly * 19. Product return/adjustment policy 20. Sales campaigns / promotion * 21. Corporate information / publicity

Note: * item nn-significant at the 0.05 level
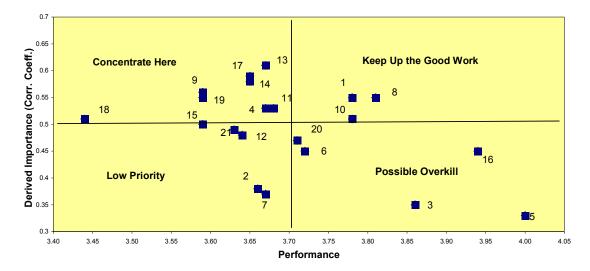
Figure 4: Quadrant Chart based on Correlation Analysis

Product Satisfaction	Direct Seller Satisfaction	Company Satisfaction
1. Effectiveness of product 2. Product guarantee * 3. Product information adequacy * 4. Product performed as claimed 5. Product catalogue 6. Innovative and unique product 7. Product is multifunctional/ multipurpose *	8. Knowledge of products and services 9. Have customer interest at heart 10. Being consistently courteous 11. Availability of direct seller 12. Giving personal advice and attention * 13. Effectiveness of sales demonstration 14. Maintaining a professional appearance 15. Continuity of contact *	16. Company's reputation 17. Concern about customers 18. Handle complaints promptly * 19. Product return/adjustment policy 20. Sales campaigns / promotion * 21. Corporate information / publicity

Note: * item non-significant at the 0.05 level

Table 3: Summarised Results of IPA for Stated and Derived Importance (regression and correlation) Methods

STATED IMPORTANCE	DERIVED IMPORTANCE	
	Regression (beta values)	Correlation (coefficients)
Quadrant 1: Keep Up the Good Work	**Quadrant 1: Keep Up the Good Work**	**Quadrant 1: Keep Up the Good Work**
Item 1 (Effectiveness of product) **** Item 3 (Product information adequacy) Item 8 (Knowledge of products & services) **** Item 16 (Company's reputation)	Item 1 (Effectiveness of product) **** Item 6 (Innovative & unique product) Item 8 (Knowledge of products & services) ****	Item 1 (Effectiveness of product) **** Item 8 (Knowledge of products & services) **** Item 10 (Being consistently courteous)
Quadrant II: Concentrate Here	**Quadrant II: Concentrate Here**	**Quadrant II: Concentrate Here**
Item 2 (Product guarantee) Item 4 (Product performed as claimed) **** Item 9 (Have customer interest at heart) ** Item 17 (Concern about customers) **** Item 18 (Handle complaints promptly) ** Item 19 (Product return/adjustment policy) **	Item 4 (Product performed as claimed) **** Item 13 (Effectiveness of sales demonstration) *** Item 17 (Concern about customers) ****	Item 4 (Product performed as claimed) **** Item 9 (Have customer interest at heart) ** Item 11 (Availability of direct seller) Item 13 (Effectiveness of sales demonstration) *** Item 14 (Maintaining a professional appearance) Item 17 (Concern about customers) **** Item 18 (Handle complaints promptly) ** Item 19 (Product return/adjustment policy) **
Quadrant III: Low Priority	**Quadrant III: Low Priority**	**Quadrant III: Low Priority**
Item 7 (Product is multifunctional/ multipurpose) ** Item 12 (Giving personal advice and attention) ** Item 11 (Availability of direct seller) * Item 13 (Effectiveness of sales demonstration) Item 14 (Maintaining a professional appearance) * Item 15 (Continuity of contact) ** Item 21 (Corporate information / publicity) ****	Item 9 (Have customer interest at heart) Item 11 (Availability of direct seller) * Item 14 (Maintaining a professional appearance) * Item 21 (Corporate information / publicity) ****	Item 2 (Product guarantee) Item 7 (Product is multifunctional/ multipurpose) ** Item 12 (Giving personal advice and attention) ** Item 15 (Continuity of contact) ** Item 21 (Corporate information / publicity) ****
Quadrant IV: Possible Overkill	**Quadrant IV: Possible Overkill**	**Quadrant IV: Possible Overkill**
Item 5 (Product catalogue) **** Item 6 (Innovative and unique product)** Item 10 (Being consistently courteous) * Item 20 (Sales campaigns / promotion)	Item 5 (Product catalogue) **** Item 10 (Innovative and unique product) * Item 16 (Company's reputation) ***	Item 3 (Product information adequacy) Item 5 (Product catalogue) **** Item 6 (Innovative and unique product) ** Item 16 (Company's reputation) *** Item 20 (Sales campaigns / promotion)

Note: *   item appears in both stated and derived (regression) importance approach   ***   item appears in both derived (regression and correlation) importance approach
           ** item appears in both stated and derived (correlation) approach   ****   item appear in stated, and derived (regression and correlation) importance approach

Quadrant 1: Keep Up the Good Work

In analysing the IPA matrix based on stated importance assessment approach as described in Figure 2, it implies that item 1 (effectiveness of product), 3 (product information adequacy), 8 (Knowledge of products & services) and 16 (Company's reputation) are the key drivers of customer satisfaction with the direct sales channel and the industry's practitioners must maintain to 'Keep Up the Good Work'. Compared to IPA based on regression analysis as illustrated in Figure 3, item 1 (effectiveness of product), 6 (innovative and unique product) and 8 (knowledge of products & services) are the key drivers of customer satisfaction with the direct sales channel. While IPA based on assessment of product importance by correlation analysis shows that item 1 (effectiveness of product), 8 (knowledge of products & services) and 10 (Being consistently courteous) are the key drivers of customer satisfaction with the direct sales channel. Apparently, only two items, which are 1 (effectiveness of product) and 8 (knowledge of products & services) fall into the same quadrant (Keep up the Good Work) across three models. The critical difference is that item 3 (product information adequacy) which is identified as a key driver of customer satisfaction in stated importance model, now falls in 'Possible Overkill' zone in correlation analysis method and conversely it was found to be an insignificant driver of customer satisfaction with the direct sales product when the attribute importance was evaluated by regression analysis.

Quadrant II: Concentrate Here

It is noteworthy to mention that only Item 4 (product performed as claimed) and Item 17 (concern about customers) fall into Quadrant II across three methods of attribute importance evaluation. Interestingly, item 2 (product guarantee) was categorised as prioritised area that need improvement as satisfaction is low and importance is high in direct importance rating, it was unveiled to be not a significant driver of customer satisfaction with the direct sales channel by regression analysis. However, 'product guarantee' falls into the low priority zone when importance rating was assessed by correlation analysis. In addition, item 18 (handle complaints promptly) was classified as high priority area for improvement by both stated importance and correlation analysis; however, it was not a significant predictor of customer satisfaction with the direct sales company.

Quadrant III: Low Priority

It appears that only item 21 (corporate information/publicity) falls into the same zone across all the three methods. Item 13 (effectiveness of sales demonstration), which is considered a low priority area by stated importance; on the contrary, it becomes a high-priority area when assessment of importance was conducted by regression and correlation analysis. Similarly, item 14 (maintaining a professional appearance) categories as low priority area by both stated importance and regression methods; on the contrary, it becomes a high priority area for improvement by correlation analysis.

Quadrant IV: Possible Overkill

Item 5 (product catalogue) was found to be located in the same zone across the three quadrant charts and item 20 (sales campaigns / promotion) which was classified as 'possible overkill' by direct rating and correlation analysis, found to be an insignificant driver of customer satisfaction with the direct sales company. It is worth noting that item 10 (being consistently courteous) which is considered as attribute of performance 'overkill' by both direct rating and regression analysis, surprisingly, it becomes a key driver of customer satisfaction when assessed its importance via correlation method.

In summary, the results presented by this study demonstrate that the points plotted in the three quadrant charts were inconsistent and the differences were probably influenced by the measurement of importance employed.

The Final Importance–Performance Analysis Model

Figure 5 portrays the resulting items which fall in the same zone when three methods were employed to assess attributes importance. The results demonstrate that Item 1 (effectiveness of product) and Item 8 (knowledge of products & services) fall in the 'Keep Up the Good Work' grid. This suggests that they are the key drivers of customer satisfaction with the direct sales channel−in other words these two attributes could be viewed as sources of significant competitive advantage. Item 4 (product performed as claimed) and item 17 (concern about customers) are located in 'Concentrate Here' zone. This indicates that these areas demand immediate actions. By prioritising improvement on these areas, practitioners might enhance overall customer satisfaction. However, if they are ignored this might pose a serious threat to the direct sales firms. Item 21 (corporate information / publicity) was revealed to be a 'Low Priority' area, hence it is not necessary for the management to focus additional effort here. Finally, it was identified that resources committed to item 5 (product catalogue), which is deemed a 'Possible Overkill' should be channelled to attributes located in the 'Concentrate Here' zone.

In essence, the combination of the three methods could identify the key drivers of customer satisfaction with the direct sales channel and areas need improvements with more confident rather than just relying on the self-stated approach. In addition, since the results of the analysis are based on attribute level, they could generate precise actions plans to the direct sales practitioners.

Quadrant II High Importance/ Low performance **CONCENTRATE HERE** **Item 4 (Product performed as claimed)** **Item 17 (Concern about customers)**	**Quadrant I** High Importance/ High Performance **KEEP UP THE GOOD WORK** **Item 1 (Effectiveness of product)** **Item 8 (Knowledge of products &services)**
Quadrant III Low Importance/ Low Performance **LOW PRIORITY** **Item 21 (Corporate information/ publicity)**	**Quadrant IV** Low Importance / High Performance **POSSIBLE OVERKILL** **Item 5 (Product catalogue)**

Figure 5: The Final Importance-Performance Analysis Model

CONCLUSIONS

The results for the comparison of ratings and rankings across the three methods clearly demonstrate the significant influence of the methods of determining the attributes importance. Only item 1 (effectiveness of product) was ranked as the most important attribute for product satisfaction across all the three methods. Surprisingly, after rigorous measurements assessment, our investigation revealed that seven items (2, 3, 7, 11, 15, 18 and 20) were not significant drivers of customer satisfaction (see Table 2). We suspect that methodological factors such as social desirability bias and extreme response tendencies due to lack of 'cognitive sophistication' (Rao and Kelkar 1997, p. 81) resulted in uniformly high ratings in self-stated importance ratings (see Table 2). Thus in this sense, we recommend that future research to cross-validates the direct rating for assessing the attributes importance with more rigorous statistical analysis techniques such as multiple regressions and correlation analysis in the order to achieve more accurate measurement of importance.

Alternatively, a satisfaction gap scores can be interpreted as an area of potential improvement and requires immediate attention, which is equivalent to the 'Concentrate Here' strategy in the quadrant chart. Apparently, this indicates that the direct sellers or the direct selling companies should give their priority to make improvements in this area. By improving the 'importance' attributes that fall short of 'performance' judgement by the customers, the company could yield the desired outcomes and prevent money being spent on improving unimportant attributes. In short, the findings could provide clear guidelines for direct sellers or companies in allocating and aligning internal resources and effort in order to maximise customer satisfaction and perhaps subsequently their retention. Our results, which are illustrated in Table 2, revealed that item 2 (product guarantee) had the largest gap (0.58) falls appropriately in the 'Concentrate Here' zone in the quadrant charts based on stated importance (see Figure 2). In contrast, it was located in 'Low Priority' zone in the quadrant chart based on correlation analysis (see Figure 4). Surprisingly, this item was not a significant driver of product satisfaction. The largest gap for direct seller (have customer interest at heart) (0.50) was appropriately located in the 'Concentrate Here' zone for both self-stated and correlation analysis methods for determining attributes importance but conversely this particular attribute fall in the 'Low Priority' zone in the quadrant model based on regression method. It should be noted that the largest gap for the direct sales company dimension (handle complaint promptly) (0.68) was located correctly in the 'Concentrate Here' zone for both self-stated and correlations analysis approaches but this specific item was not a significant driver of customer satisfaction with the company. The findings were perplexing but relatively consistent across the three methods employed to assess attributes importance. Nevertheless, this analysis must be used prudently and the results should be interpreted with caution.

Generally, the results of IPA presented by the current investigation reflect that the matrix is sensitive to the importance measure used. These empirical findings further support the similar evidence drawn by previous researchers (see, for example, Matzler et al. 2003). Clearly, this research has demonstrated that classical IPA

could be misleading even when valid and reliable measures were used. Only one or two attributes fall into the same zone when the attributes importance was assessed across three methods. Thus, we strongly encourage users not only to employ direct importance ratings but to cross-validate it with other methods of assessing the attributes' importance such as regression and correlation analysis as presented by our final IPA model (see Figure 5). In addition, we suggest researchers and practitioners employ valid and reliable measures when conducting IPA, as our results demonstrate that several items fall into the same zone even though different methods of assessing the attributes' importance were utilised and has been confirmed by previous researchers (see, for example, Bacon 2003 and Matzler et al. 2003). IPA approach as suggested by our study may not be a simple analytical technique, when compared to its classical version, however it is still considered applicable and relevant to the practising manager. The crucial question is how valid is IPA as a tool that yields prescriptions for courses of action that a company can pursue in the aim to manage customer satisfaction. In our view, if IPA is to be employed confidently, the trade-off between simplicity (which not producing consistent results) and difficulty of employing more rigorous approach as suggested by our work (which more likely generate valid results) is certainly worth strong consideration.

It should be noted that a limitation of this study is that the ratings of the attributes' performance and importance might be influenced by respondents' demographic backgrounds and experiences. It is reasonable to speculate that as a consequence, IPA yielded mixed results where clear and logical trends difficult to be recognised. In this regards this could offer a fruitful future research direction, IPA need to be closely examined which would demand a theoretical explanation. Specifically, future research should develop IPA models based on different customer segments. It is possible and reasonable to suspect that demographic segments such as gender and age or level of customer experience could produce significantly different results. Perhaps, precise area of improvement could be determined and immediate managerial plans and actions might be effectively tailored to these customer segments.

REFERENCES

Bacon, D., R. (2003). A comparison of approaches to Importance-Performance Analysis. *The Market Research Society,* 45(Quarter 1), 55-71.

Barsky, J., D., & Labagh, R. (1992). A strategy for customer satisfaction. *Cornell Hotel and Restaurant Administration Quarterly*, 33(5), 32 - 39.

Bernhardt, L. K., Donthu, N., & Kenneth, A. P. (2000). A longitudinal analysis of satisfaction and profitability. *Journal of Business Research, 47*, 161-171.

Burnham, A. T., Frels, K. J., & Mahajan, V. (2003). Consumer switching costs: A typology, antecedents, and consequences. *Journal of the Academy of Marketing Science,* 31(2), 109-126.

Chen, D. R., Jeng, L. J., & Chou, C. C. (1998b). *A study of consumers who buy from MLM channel in Taiwan.* Paper presented at the Asia Pacific Decision Science Institute Conference Proceedings.

Ching, C. Y. (2003). Improvement actions based on the customers' satisfaction survey. *Total Quality Management and Business Excellence,* 14(8), 919 - 930.

Chu, R. (2002). Stated-importance versus derived-importance customer satisfaction measurement. *Journal of Services Marketing,* 16(4), 285-301.

Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, xvi (February), 64-73.

Cronin, J. J., & Taylor, S. A. (1992). Measuring service quality: a reexamination and extension. *Journal of Marketing, 56*(July), 55-68.

Dolinsky, A. L. (1991). Considering the competition in strategy development: An extension of importance-performance analysis. *Journal of Health Care marketing,* 11(March), 31.

Duke, C. R. & \mount, S.A. (1996). Rediscovering performance-importance analysis of products. *Journal of Product and Brand Management,* 5(2), 43 – 54.

Endut, W. (1999). Direct Selling Industry in Malaysia: Customers and Challenges in 21st. Century. *Malaysian Journal of Consumer and Family Economics,* 2, 73-88.

Gerbing, D. W., & Anderson, C. J. (1988). An updated paradigm for scale development incorporating unidimensionality and its assessment. *Journal of Marketing Research, 25*(May), 186-192.

Green, P.E., Goldberg, S. M. & Montemayor, M. (1981). A hybrid utility estimation model for conjoint analysis. *Journal of Marketing,* 45 (winter), 33-41.

Hayes, B. E. (1998). *Measuring customer satisfaction: Survey design, use, and statistical analysis methods* (2nd ed.). Milwaukee, Wis.: ASQ Quality Press.

Johnson, M. D., Gustafsson, A., Andreassen, T. W., Lervik, L., & Cha, J. (2001). The evolution and future of national customer satisfaction index models. *Journal of Economic Psychology, 22,* 217-245.

Jones, M. A., & Sasser, W. E. (1995). Why Satisfied Customers Defect. *Harvard Business Review, 73*(1), 88-99.

Lambert, D. M., Adams, R. J., & Emmelhainz, M. A. (1997). Supplier selection criteria in the healthcare industry: A comparison of importance and performance. *International Journal of Purchasing Materials Management, 33*(1), 16-22.

Martilla, J. A., & James, J. C. (1977). Importance-performance analysis. *Journal of Marketing, 41*(January), 77-79.

Matzler, K., Sauerwein, E., & Heischmidt, K., A. (2003). Importance-performance analysis revisited: The role of factor structure of customer satisfaction. *The Service Industries Journal, 23*(2), 112-129.

Mittal, V., Kumar, P., & Tsiros, M. (1999). Attribute level performance, satisfaction, and behavioural intentions over time: A consumption-system approach. *Journal of Marketing, 63*, 88 -101.

Nunnally, C. J. (1978). *Psychometric Theory* (Second ed.). New York: McGraw-Hill Book Company.

Oh, H. (2001). Revisiting importance-perfromance analysis. *Tourism Management, 22*, 617-627.

Oliver, R., L. (1980). A cognitive model of the antecedents and consequences of consumer satisfaction decisions. *Journal of Marketing Research,* 42(November), 460-469.

Oliver, R., L. (1997). *Satisfaction: A behavioral perspective on the customer*. New York: McGraw-Hill.

Parasuraman, A., Zeithaml, A. V., & Leonard, L. B. (1988). SERVQUAL: A multiple-item scale for measuring customer perception. *Journal of Retailing,* 64(1), 12-41.

Patterson, P. G., Johnson, L. W., & Spreng, R. A. (1997). Modelling the determinants of customer satisfaction for business-to-business professional services. *Journal of Academy of Marketing Science*, 25(1), 4-17.

Piercy, N. F. (2002). Research in Marketing: Theory with trivial or risking relevance? *European Journal of Marketing,* 14(4), 257-267.

Rao, C. P., & Kelkar, M. M. (1997). Relative impact of performance and importance ratings on measurement of service quality. *Journal of Professional Services Marketing, 15*(2), 69 - 86.

Rentz, O. J., Shepherd, C. D., Tashchian, A., Dabholkar, P. A., & Ladd, R. T. (2002). A measure of selling skill: Scale development and validation. *Journal of Personal Selling and Sales Management, 22*(1), 13-21.

Robbins, S. P. (2002). *Management*, (7th Ed.) Upper Saddle River, New Jersey: Prentice Hall.

Roszkowski, M., J. (2003). The nature of the importance-satisfaction relationship in ratings: Evidence from the normative data of the Noel-Levitz student satisfaction inventory. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 16*.

Sargeant, A., & Msweli, P. (1999). Network marketing in South Africa: An exploratory study of consumer perceptions. *Journal of International Consumer Marketing,* 11(3), 51-66.

Shun, L. Y., Shankar, V., Erramilli, M. K., & Murthy, B. (2004). Customer value, satisfaction, loyalty, and switching costs: An illustration from a business-to-business service context. *Journal of the Academy of Marketing Science*, 32(3), 293-311.

Westbrook, R. A. (1997). Observations on applied CS/D research. *Journal of Customer Satisfaction, Dissatisfaction and Complaining Behavior,* 10, 1-6.

Westbrook, R. A. (2000). Towards a managerial research agenda for customer satisfaction. *Journal of Customer Satisfaction, Dissatisfaction and Complaining Behavior,* 13, 17 - 25.

Woodruff, R. B. (1993). Developing and applying consumer satisfaction knowledge: Implications for future research. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 6*, 1-11.

Woodruff, R. B. (1997). Customer value: The next source for competitive advantage. *Journal of the Academy of Marketing Science,* 25(2), 139-153.

Yuskel, A., & Rimmington, M. (1998). Customer-satisfaction measurement. *Cornell Hotel and Restaurant Administration Quarterly*, 39(6), 60-70.

Zeithaml, V. A. (2000). Service quality, profitability and the economic worth of customers: What we know and what we need to learn. *Journal of the Academy of Marketing Science, 28*(1), 67-85.

The Effect of Consumers' Ethnocentrism, Materialism Attitude, and Prestige Sensitivity on Purchase Intention of Malaysian-made Products

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ABSTRACT

The purpose of this paper is to examine the effect of consumers' ethnocentrism, materialism attitude, and prestige sensitivity on purchase intention of Malaysian made products. The conceptual model, based on Fishbein and Ajzen's (1975) theory of attitude and behavioral intentions model of reasoned action, was developed to generate the hypotheses. The findings of the study indicated that consumers' ethnocentrism was positively related to purchase intention of Malaysian-made product. On the other hand, as we expected, materialism attitude and prestige sensitivity consumers were unlikely to purchase Malaysian-made products. This paper considers the connection between marketing, the consumer society and the perspectives of retailing and merchandising. Conclusion drawn from the current study's findings and their implications are discussed in the context of both managerial perspectives and future research.

INTRODUCTION

The globalization of business has resulted in increased competition among domestic and multinational firms in domestic and foreign markets (Netemeyer, Durvasula, Lichtenstein, 1991; Suh and Kwon, 2002). The increased of global competitions have giving consumers more buying choice at the very competitive prices (Abdul Razak, Safiek, Md Nor, 2002). The positive improvement of political and economic pace provides much potential for foreign marketers to invest in the potential market around the globe. For example, the progressive economic development in Malaysia has attracted many global firms to operate in its markets. To penetrate successfully in Malaysian market, marketers must understand the consumers' varying needs and preferences toward domestic and imported products.

The globalization of markets also has lead researchers and business practitioners to identify factors that influence consumer attitudes and behavior towards Malaysian-made products. For that reason, research on consumer ethnocentrism, materialism attitude, and prestige sensitivity may be an important step to understand the way in which individual and organizational consumers compare domestic versus imported products, as well as the reasons that lead them to develop patriotic prejudices against import (Martinez, Zapata, & Garcia, 2000).

The above discussion leads the current study to address the following question: How can marketers effectively position their product to influence Malaysian consumers' purchase intention toward domestic product? Does consumer ethnocentrism play an important role in decision-making when product of interest is an important source of jobs and income for domestic economy? Does materialism attitude have strong effect on consumer purchase intention of imported products, due to it material possession and outlook? Will consumers perceive better quality and prestige sensitivity of imported products part of the reasons for them to buy more imported products versus domestic products?

Although previous research identified consumer purchase intention on imported products, only few researchers have examined consumers' ethnocentrism variables in relation to Malaysian consumers. As well, while previous research is certainly valuable, one cannot help but notice the absence of studies investigating the effect of material attitude and prestige sensitivity on Malaysian consumers purchase intention. In the current study, we use the Fishbein and Ajzen's (1975) theory of attitude and behavioral intentions model of reasoned action as a basis for providing a better understanding of the interrelationship among the listed variables.
The current study was interested in examining consumer ethnocentrism, materialistic attitude, and prestige sensitivity, and their effect on consumer purchase intention of Malaysian-made products. This study is to improve our understanding of why certain segments of consumer prefer domestic products while others do not care about the distinction between domestic and imported product categories.

It is hoped that the findings of this study would add to the existing empirical research and knowledge in the local and international context to both academicians and practitioners. Further we anticipated that the finding of the

current study would help either local or international business practitioners and marketing and retail managers to position their products in the Malaysian market by using appropriate marketing mix strategies.

LITERATURE REVIEW

We reviewing relevant literature based on the theoretical background provided in the conceptual framework section. Much emphasis will be given to the findings of the studies rather than the methodology adopted. The literature review is relevant to the current study deals with consumers' ethnocentrism, materialistic attitude, prestige sensitivity, and purchase intentions.

Several theoretical perspectives in term of consumers' purchase intention have been discussed in consumer behavior literature. In the current study, we examine the variable of consumer ethnocentrism, materialism attitudes, prestige sensitivity, and purchase intention through the perspective of Fishbein and Ajzen's (1975) theory of attitude and behavioral intentions model of reasoned action. This theory describe conceptual framework to establish the context of the current study subject.

According to Fishbein and Ajzen (1975), an attitude is defined as beliefs the person holds about something, whereas behavioral intention is the predictor of person behavior. Reasoned action involve the implications of individual deliberate action before decide to engage in a given behavior and consider all the advantages as well as disadvantages before reflect on their attitudes.

Fishbein and Ajzen's (1975) theory does specify that a particular attitude associate with a particular behavior, which suggest that observers infer from a consumer's behavior dispositions lead observers to make either favorable or unfavorable attitudes about him or her. The Fishbein and Ajzen's (1975) theory have been used to explain relationships between attitudes, intentions, and behavior (Vaidyanatahan, Aggarwal, Stem, Muehling, & Umesh, 2000). On the basis of the above explanation, we believe that this theory has brought new ideas to the study of consumers' ethnocentrism, materialism attitude, and prestige sensitivity and provides some explanations for purchase intention.

Derived from the Fishbein and Ajzen's (1975) theory, we imply that consumer ethnocentrism reflects theirs belief on the virtue of purchasing domestic products. Consumer attitude on ethnocentrism is need as well in differentiating consumer groups who prefer domestic product to imported product (Huddleston, Good, & Stoel, 2001). The theoretical argument described above is based on the assumption that consumers are expected to favor domestic product and to reject imported products based on the belief that buying imported products is unpatriotic and would damage national economic.

Based on the Fishbein and Ajzen's (1975) theory, we could explain that consumers' materialism attitudes toward accumulation of possession is influenced by their attitude and behavior to express a distinct self-identity through the variation of economic level and social status. The literature on materialism provides a framework, which helps to understand the meaning that consumers attach to worldly possessions may impact the differences in consumer attitudes, thereby creating an inconsistency between their materialistic attitude and purchase intention. Applying theory of attitude and behavioral intention to materialism, we conceive that materialism people define possessions as the center of theirs life and their happiness depends on the possessions of goods rather than social interaction (Browne and Kaldenberg, 1997).

Consumers' belief constitutes reasons for action and makes a coordinated contribution to determine the action that result from their action and belief to own prestigious product (McGowan and Sternquist, 1998). Based on Fishbein and Ajzen's (1975) theory, we imply that consumers attitude inspire them to have a prestigious lifestyles that represents distinction in an area related to one's self image. This is to the assumption that consumers' attitude and behavior lead observers to make favorable image on their prestige life. Accordingly Fishbein and Ajzen's (1975) theory support the notion that prestige sensitivity consumers need to communicate their prestigious self-identity by frequently purchase certain products and merchandise that show the exclusivity of their social status and symbolic consumption qualities to various others. Thus, we relate that intention provides a link between consumers' reaction to the products purchase and their acquisition of the prestigious products.

Lying on Fishbein and Ajzen's (1975) theory, we generate that consumers' purchase intention serves as the mediator between their attitude and their actual purchase behavior. Purchase intention is a surrogate measure of future behavior that has been a well-established phenomenon in the literature (Fishnbein and Ajzen, 1975). For example, in the study related to purchase intention, the attitude and behavioral intention relation was found to be consistent as information processed is available about the consumers' attitude towards products (Whitlar,

Geurts, & Swenson, 1993). This relation has received widespread empirical support in consumer behavior research, which posits that an attitude is subjective norms that influence intentions. Although normally a direct positive relationship exists between attitudes and behavioral intentions, we expect it is also commonplace to come across counterexamples in everyday shopping behavior where consumers' attitudes have varied their purchase intention.

Consumer Ethnocentrism

A measure of ethnocentrism makes sense in a study on consumers' purchase intention, where the appropriateness and morality of purchase imported, rather than domestically, may be in question. Shimp and Sharma (1987) introduced the phrase "consumer ethnocentric tendencies" to represent beliefs held by American consumers about the appropriateness, indeed morality of purchasing foreign-made product (p.280). Consumer ethnocentrism also refers to the phenomenon of consumer preference for domestic products but prejudice against imports due to nationalism and patriotism (Levine and Campbell, 1974; Caruana; 1996; Martinez et al., 2000). Consumer ethnocentrism also focuses on immorality of purchasing foreign made due to the belief that it is unpatriotic and detrimental to the economy, and results in loss of jobs in local industries (Shimp and Sharma, 1987; Kucukemiroglu, 1999; Klein and Ettenson, 1999).

Shimp and Sharma (1987) developed a 17-item scale called CETSCALE (Consumer Ethnocentric Tendencies Scale) to assess consumers' ethnocentric tendencies. Although CETSCALE originally introduced in the context of American consumers, researchers in a limited but growing number of countries have tested the ethnocentric tendencies of consumers. It has been expected to show similar effects across national boundaries. Studies have consistently found that the more ethnocentric a nation is, the less favorable their attitudes and the less likely they will hold purchase intentions towards foreign products (Han, 1988; Durvasula, Andrews, & Netemeyer, 1992; Flynn and Goldsmith, 1993; and Herche, 1994). The concept of ethnocentrism is a potentially valuable explanation of why consumers often develop negative orientations towards foreign-made products (Watson and Wright, 2000). This negative orientation towards purchase intentions of foreign products has been found with consumers in France and Japan (Netemeyer et al., 1991).

Levels of ethnocentrism refer to differences between micro-ethnic, regional, and macro-ethnic groups (Caruana, 1996). The more importance a person places on whether a product is made in his/her home country, the higher the ethnocentric tendency. Highly ethnocentric people take pride in their own values, symbols, and people, and hold in contempt the objects and values of other groups (Preiswerk and Perrot, 1978; Netemeyer et al., 1991). They are most prone to biased judgment by being more inclined to adopt the positive aspects of domestic products and to discount the virtues of foreign-made products (Kasper, 1999). Highly ethnocentrism consumers feel that they should buy more local products, whereas low ethnocentric consumer feel that they do not exhibit such concerns and tend to assess imported products based on their own merits (Kaynak and Kara, 2002). By using the CETSCALE, we could verify that consumers exhibit different levels of ethnocentrism, based on the strength, intensity, and magnitude that vary from country to country (Huddleston and Good, 1995).

Materialism Attitude

A growing body of research suggests that people engage in consumption behaviors indicate to others that they are successful in achieving their materialism possessions and quality of ownership (Richin and Rudmin, 1994; Belk, 1995; Ryan and Dziurawiec, 2001). In general, the concept of materialism suggests that possessions and money is route to personal happiness and social progress (Moschis, 1981).

Richins and Rudmin (1994) describes materialism in terms of its role in consumer culture as "the idea that goods are a means to happiness and life satisfaction is not achieved by religious contemplation or social interaction, or simple life, but by possession and interaction with goods. Materialism is also defined as a value held by an individual, who embodies the importance one attaches to material possessions and their acquisition as a necessary or desirable form of conduct to reach desired end states including happiness (Belk, 1995; Richins and Dawson, 1992). Materialist people perceive that gain pleasure from acquisition of wealth and possessions of material goods is the triumph and as means of providing great satisfaction in their lives (Ryan and Dziurawiec, 2001).

In essence, materialism is a value orientation that has implications for people's desires, decisions, and psychological well being of social behavior. Materialism incorporates the importance of certain end states and the belief that possessions are the means to achieve these end states (Ryan and Dziurawiec, 2001). Belk (1984) argues that materialism can be thought of as a cluster of related traits, attitudes, and values focusing on

possessions and guiding the selection of products. Materialistic individuals are prone to be acquisitive, to have positive effects related to acquisition, and to place high priorities on ownership (Browne and Kaldenberg, 1997). The possessiveness, lavishness, and envies represent materialism in that they express a person's relationship to materially object by defining status and stylistic intelligence in the function of possessions assemblage. These attitude affluence consumers to accumulate their material possessions as a consequence of wealth, serve as a live information system to signal to others the owner's self-image, rank, values, invoices thought, beliefs, desires, intentions, and sensory experience (Richin and Rudmin, 1994; Browne and Kaldenberg, 1997).

As motivation, materialism has a status component that reflects the intended and actual use of material objects as a means of social recognition and to symbolize one's personal success (Richins and Dawson, 1992). The component of materialism involves status and purchases high quality and high price products to distinguish themselves from others. Undeniably, materialism is a common value orientation among people in industrialized capitalistic cultures. The apparent indicator of people in industrialized capitalistic cultures involves a desire to own expensive product; as a means for life comfort, luxury achievement, and financial success (Dittmar, 1992). When a culture places a strong emphasis on individual economic accomplishments, people tend to develop extrinsic aspirations involving assets and acquisitions, and success with social recognition (Prendergast and Wong, 2003). Acquisition of possessions, and luxury consumption are activities taking place in a process of impressions creation of material identity (Marcoux, Filiatrault, & Cheron, 1997).

Prestige Sensitivity

Only few marketing researchers have empirically examined prestige shopping behavior and the factors that lead consumers to perceive specific products categories as prestigious item. Although Lichtenstein, Ridgway, and Netemeyer (1993) use prestige sensitivity as indication for price cue, their study does not address the extensive myriad of other cues within shopping environments and purchasing behavior. In the current study, prestige sensitivity is expected to relate more with socially visible products and behaviors that consumers might regard as indicative of prestige or congruent with their own self-image.

Prestige sensitivity is defined as favorable perceptions of the price cue based on feelings of prominence and status that higher prices signal to other people about the purchaser (Lichtensein et al., 1993). Prestige has always been designated as constituting a basic symbol of one's social standing of status. An important class of symbols involves association with a prestigious group that represents excellence or distinction in an area related to one's self image (Dawson, 1988). Within the context of symbolic consumption, individuals with a strong need for prestige seek to purchase products for their symbolic qualities because such products represent a means to communicate one's actual or desired for social status.

As previously mentioned, prestige sensitivity views as the propensity to make attributions made by other consumers on the basis of the price level. Prestigious consumers are more likely to pay higher prices for merchandise that they valued to be prestigious (McGowen and Sternquist, 1998). Lichtenstein et al. (1993) state that higher price can make a product more attractive because the price is taken as an indicator of the prestige value of the products. It has been suggested that prestige sensitivity is related to socially visible behaviors, whereas a price/quality schema is influenced by cues that reinforce the validity of using price to imply quality (McGowen and Strenquist, 1998). Braun and Wicklund (1989) mentioned that as price conscious as consumers have become, they are willing to pay more for products in which they have an ego investment on the products. Consumers pay more when they feel that high-priced products will signal high quality, and convey prestige to others (Jin and Sternquist, 2003). In Japan and the United States people use high price as a proxy for quality and an indication of prestige (McGowan and Sternqusit, 1998).

Prestige sensitivity is expected to present in more socially visible behaviors, such as shopping for expensive, stylish, elegant, and luxury types of products. Consumers expect to find high quality products and merchandise in more prestigious stores (Heisey, 1990).
In the study of prestigious clothing, Deeter-Schmelz, Moore, & Goebel (2000) defined prestige preference as an individual's preference for shopping in clothing store where the combination of patron status, store types and atmosphere, merchandise price, quality, branding, and fashion are combine to create a particular prestige level. Besides price and quality, brand name also reported to be very important key indicator with regards to prestige preference (Dawson, 1988). Individual tend to relate brand symbols to self-concepts; with preferences for high prestige brands that reinforce their own actual or desired prestigious self-image, and communicate this self-image to others.

Purchase Intention

Earlier research has shown that consumers who report intentions to purchase a product possess higher actual buying rates than consumers who report that they have no intention of buying (Berkman and Gilson, 1986). While it is accepted that purchases intention does not equate to actual purchase behavior it has been demonstrated that measures of purchase intention do possess predictive usefulness (Jamieson and Frank, 1989). Such utility is likely to be interest to producers, manufacturers, marketers, and retailers.

According to Whitlark et al. (1993) purchase intention means that a purchase probability associated with an intention category at the percentage of individuals that will actually buy product. Purchase intention measures have been used frequently to identify buying livelihoods for products within defined time periods (Whitlark et al., 1993). Purchase intention surveys give good forecast for marketing the new products (Jamieson and Frank, 1989). Percentage of buyers for a particular product can be estimated by asking consumers to indicate their likelihood to purchase using a multi-category purchase intention scale. Measuring this purchase likelihood, Whitlark et al. (1993) found that seventy five percent of those consumers who stated a purchase intention did purchase within three months.

Understanding that consumer belief about the products can be a significant factor influencing consumers purchase intention, thus a sales and purchase forecast often plays an important role in marketing strategy. It provides a basis for estimating profits associated with implementing a particular marketing strategy. A common forecasting method used by businesses to forecast the sales of a new product is to ask potential customer the likelihood of purchasing the product that is being investigated (Jamieson and Frank, 1989).

Consumer responses to probability statements like "probably will buy" or definitely will buy are often used by businesses to forecast sales of new or modified products. While this technique is widely used, there is little published research on the relationship between an individual's purchase intentions and actual purchase behavior. It would be useful to know what percent of those who say they are in the "probably will buy" group actually buy (Whitlark et al., 1993). An evaluation of consumers' product perceptions and characterization is important to assess consumers' demand.

RESEARCH METHODOLOGY

Sampling And Data Collection

In an attempt to increase our understanding of consumer ethnocentrism, materialistic attitude, and prestige sensitivity on purchase intention of Malaysian-made products, one-product category was selected for empirical testing. We choose furniture as our product category in the current study. A simple random sample is used as a method of data collection. The samples were drawn from faculty staff in one of the universities in Malaysia. The questionnaires were attached with self-adhesive envelope. Altogether 800 copies of questionnaires were mailed to respondents between 22 to 24 December 2003. Though the samples cannot be viewed as nationally representative, they do constitute comparable populations who purchase Malaysian-made products. The samples different in terms of age, level of education, and work position that are expected to have variation in their feelings of ethnocentrism, materialism attitude, and prestige sensitivity on purchase intention of Malaysian-made products.

Instrument and Measurement

A self-report questionnaire was developed based on past research in order to collect information to test the hypotheses. The questionnaires contained 50 items that included measurement of ethnocentrism, materialism attitude, prestige sensitivity, and purchase intention scales. The surveys were taken from previously developed scales and modified when necessary. The first section of the mailed questionnaire included questions about ethnocentrism, materialism attitude, prestige sensitivity, and purchase intention. The last section included demographic and socioeconomic questions, which are used to interpret the responses on other questions. The mailed questionnaire technique is argued to be efficient when the researcher knows exactly what is expected from the questionnaire, and knows how to measure the variables (Sekaran, 1992). It is also a good technique when the target respondents are knowledge enough to understand the questions on their own.

Pilot Study

The questions have to be finalized before they are distributed because clarification and changes to the questions are impractical. Since the surveys are taken from previously developed scales, we modified it when necessary and pilot tested the revised version. The pilot test sample included thirty respondent and reliabilities is accepted for all the scales. The results from this pilot study provided us with the research direction. All items in the questionnaire were randomly mixed to prevent a reference bias. Reliability for the small pilot sample size was .52 to .86 (Table 1). Corresponding coefficient alpha estimates for ethnocentrism, prestige sensitivity, materialism attitude, and purchase intention were .86, .70, .52, and .63, respectively (Table 1). These results were considered satisfactory (Nunnally, 1978). Since reliabilities were still not acceptable for some sales we further revised the wording for the problematic items before the final questionnaires were sent to the respondents.

Table 1: Comparison Between the Previous Scale Reliabilities and the Pilot Test

Items	Previous scale	Pilot test
Consumer ethnocentrism	.91 to .96	.86
Materialistic attitude	.61 to .84	.70
Prestige sensitivity	.78 to .98	.52
Purchase intention	NA	.63

Consumer Ethnocentrism

The current study used Shimp and Sharma's (1987) consumer ethnocentrism (CETSCALE) to measure consumers' ethnocentrism as a basis for identifying consumer attitude, characterization, and market segmentation. This scale has been tested and found to be reliable and valid in the USA, France, Japan, West Germany (Netemeyer et al., 1991), Russia (Durvasula et al., 1992), Korea (Shimp, Sharma, & Shin, 1995), and Poland (Huddleston and Good, 1995). Coefficient alpha ranged from 0.91 to 0.96 in all of the above studies, giving evidence of internal consistency. The Cronbach's alpha for pilot test was .86 (Table 1). The scale proved to be reliable and provided for contingent and discriminant validity in virtually all samples to which it was administered. The 17-items of CETSCALE measure the tendency of consumers' attitude towards foreign and domestic products. Respondents were asked to indicate their agreement with each of 17 statements, ranging from (1 = strongly disagree to 5 = strongly agree).

Materialistic Attitude

The instrument for measuring materialistic attitude was developed based on past research (Moschis, 1981; Tashchian, Slama, & Tashchian, 1984; Richins and Dawson, 1992). The coefficient alpha of the scale on previous study ranged from .61 to .84. Materialistic attitude was measured with nine different items. Materialism scale measure the individual's material symbols and reflections of identity in terms of social-material status. The reliability of the scale for the pilot test, computed with Cronbach's alpha was .70 (Table 1). Scorings accomplished with a five-point Likert format (1 = strongly disagree to 5 = strongly agree).

Prestige Sensitivity

Lichtenstein et al., (1993) price-based prestige sensitivity and product-quality scale are used to measure prestige sensitivity. Lichtenstein et al. (1993) reported the coefficient alpha reliability for prestige sensitivity was ranged from .78 to .98. The pilot test Cronbach's alpha was low .52 (Table 1). The price-based prestige sensitivity scales measures the degree to which people purchase higher price brands and product as an outward sign of prestige (Netemeyer, et al., 1995). Scoring is conducted on a five-point Likert scale (1 = strongly agree to 5 = strongly agree).

Purchase Intention

Purchase intention surveys give good forecasts of products (Whitlar et al., 1993). The instrument for measuring purchase intention is developed based on past research. Purchase intention measured using a scale adopted from Whitlar et al.'s (1993) study, with five level of intention. Reliability of pilot test for purchase intention was $\alpha =$

.63 (Table 1). Respondent were asked a general question about how likely they will purchase Malaysian-made products, using a Likert scale of five-point (1 = strongly disagree to 5 = strongly agree).

With regard to the issues of low reliability of purchase intention scale in the current study, we became somewhat concerned with our typical choices of words or phrases to describe purchase intentions. Mosteller and Youtz (1990) point out that some probability phrases appear to have more precise meanings than others. In their work, the probability categories such as "certain," "high chance," "even chance," "low chance," and "never" are much better terms than "definitely," 'probably," and "might." In particular, the "might/might not buy" often used for purchase intention surveys needs to be replaced by phrase such as "equally likely to buy as not buy," since everyone can truthfully answer that they "might or might not buy" (Whitlar et al., 1993).

In the study of product and service bundling decisions and their effects on purchase intention, Herrman, Huber, and Coulter (1997), for example, used the Likert scale of seven point for purchase intention, in which "1=Not likely to purchase" and "7=Very likely to purchase". The previous study has shown that various statement have been adapted in measuring and developing the purchase intention scale. Thus the selections of appropriate words may improve the reliability of purchase intention scale.

Demographic

Respondents' demographic information was obtained through series of questions on gender, age, marital status, household size, income level, and education level. This is to provide an overall impression about the population of interest.

Non-response Bias

In analyzing the questionnaire data, it is important that appropriate statistical tools are used, but before the data are analyzed, a test is conducted to detect the possibility of a non-response bias. The mailed questionnaire survey could suffer from a low response rate, which would give rise to a problem of non-response bias. A non-response bias occurs when only a proportion of the sample responds to the questionnaires and the responses are not representative of the samples (Wass and Wells, 1994). To overcome the problem of low response rate, the following methods were taken; a simple but attractive questionnaire in a booklet form, with cover letters printed on letterhead papers, self-addressed stamped, return envelopes, cover letters stressing the importance of the responses and giving assurance of confidentiality, and follow up.

Hypotheses

Based on previous research, we are interested in examining the link between consumer ethnocentric, materialistic attitude, prestige sensitivity, and purchase intention of Malaysian made products versus imported products. Past research demonstrates that consumers' willingness to buy a product thus be influenced by several variables. Further, we derived insight from the Fishbein and Ajzen's (1975) theory, which constitutes the overall conceptual foundation for our hypotheses. Demonstration of hypotheses could provide an important basis for benefit-based retailing and marketing strategies to tap the target market.

Consumer Ethnocentrism And Purchase Intention

This hypothesis is related to the effect of consumer ethnocentrism on purchase intention of Malaysian made products. Durvasula et al., (1992) mention that by examining the consumers' ethnocentrism, we could determine the strength and direction of ethnocentric beliefs that affect their purchase decisions of local products.

A series of nomological validity tests conducted in the USA by Shimp and Sharma (1987) indicated that consumer ethnocentrism is the moderate predictive of consumers purchase intentions on domestic products. They found that ethnocentric tendencies have significantly negative correlation with purchase intentions and attitudes towards foreign products. Netemeyer et al. (1991) reported that ethnocentric consumers have high tendency to reject imported products because they regard that nationalistic emotions affect their attitudes to purchase more of local products. In the current study we relies on the resumption that consumers' patriotic emotions significantly have positive effects on attitudes and purchase intentions of Malaysian-made products.

In mid 1997, Malaysia was severely affected by the outbreak of economic crisis. In response to the crisis, the government intensively encouraged consumers to purchase more of domestic product to stabilize the economy. Although this crisis had downturn the Malaysian economic performance, it has raised Malaysian consumers' patriotism to purchase more of local-made products in conserving the nation's wealth. It is conceivable that at least some Malaysian consumers will not purchase imports because of the moral implications on economic performance, no matter how attractive are the products. Devotion for one own country, fear of losing control of economic interests due to the harmful effects of purchasing imports and foreign competition make consumer to overestimate the quality and value of domestic products (Klein and Ettenson, 1999 Watson and Wright, 2000; Kaynak and Kara, 2002). As a matter of fact, this have encourage consumer to purchase more of domestic product versus imported (Han, 1988; Herche, 1994; Kucukemiroglu, 1999).

As one of the developing country, Malaysian should be continually progressed and cannot be daunted by economic deterioration due to heavy purchase of imported products by Malaysian consumers. Thus, ethnocentrism consumer implies that purchasing imports is wrong, unpatriotic, and results in loss of jobs in industries threatened by imports. Drawing from the above information, we suggest that consumer will respond positively to "buy the Malaysian-made products" as a moral obligation to purchase, and intense preference for domestic products. Since consumer ethnocentrism has been known as one of the antecedents that influencing consumers purchase intention on imported products, its is predict that:

> H1: Ethnocentric consumers are positively related to purchase intentions of Malaysian-made products.

Materialistic Attitude And Purchase Intention

Relying on concepts from the materialism literatures, we forward hypotheses that relate component of materialism with purchase intention. By linking the development of materialism concept to aspects of purchase intention, we hope to uncover a general mechanism capable of explaining why certain consumers are particularly dispassionate in purchasing Malaysian-made products. Dittmar (1992) views material possessions as material symbols and reflections of identity in terms of social-material status. This view of possessions and self-identity connects to positional goods, as both are quoted to explain a move away from buying domestic product to imported product (Dittmar, 1992).

Materialism associates with consequence of higher standard of living, where financial aspirations may push people to possess an important need for achievement in work, implying efficiency, diligence, and perseverance (Richins 1992). Materialism is considered a manifestation for life achievement given that it determines how people spend time and money and what they consider to be importance in their immediate surroundings. Taking into account that material possession is an involving activity, highly materialistic individuals are devoting more energy spends to purchase the products that they desire (Browne and Kaldenberg, 1997). These high involvement purchase process due to the extension of the information search in product attributes such as quality, design, and the best of workmanship in product and brands (Prendergast and Wong, 2003).

O'Shaughnessy and O'Shaughnessy (2002) claim that the orientation of modern capitalist societies is toward the marketing and consumption of goods with societal members extraordinarily concerned the accumulation of material possessions. For instance materialistic consumers in affluent capitalist societies would be content to spend more on luxury goods (Prendergast and Wong, 2003). Reasonably, people strive to own luxury products, by buying imported product to carve out some private dominions in which they can enjoy personal freedom. A case in point of Malaysian neighborhood, Singaporean, who are heavily influenced by western culture has shown a high materialistic orientation and look for the best of material comfort and money in their life (Kua, Kwon, Jiun, & Wirtz, 2000).

Indeed, this scenario had been occurred in Malaysia. When Malaysians' economic and social class varies widely and inevitable exist, people seek status and visibility in materials possessions that reflect their income level and life achievement. Undoubtedly today, materialism has increased dramatically among Malaysian society with sudden urbanization and commercialization, where drastic social changes have increased social mobility. This condition causes people to exposure more on foreign culture and their product usage, which increases the tendency of Malaysian to purchase imported products.

We anticipate that Malaysian consumer who are materialistic pursue their happiness through the acquisition of possessions that focus upon material achievement and connected with important others. Derived from the above explanation, we suggest that materialist attitude influence Malaysian consumers to consume more of imported product versus Malaysian-made products based on the perception that imported products express their

accumulation of material possession, which reflect their acquisitiveness identity, high purchasing power, and admirable life achievement. This conceptualization leads to the hypotheses examined:

> H2: Materialistic attitude consumers are negatively related to purchase intentions of Malaysian-made products.

Prestige Sensitivity And Purchase Intention

Our last hypothesis is on consumer prestige sensitivity that affects their purchase intentions of Malaysian-made products. Consumers with preferences for prestige favor products that reinforce their actual or desired for prestigious self-image and communicate this self-image to others. Prestige sensitivity is likely to be high among socially conscious group and affluent society who seek the symbols of status and power in their purchases. Consumers perceive a myriad of prestige cues, which include brand, quality, patron status, and store atmospherics (Deeter-Schmelz et al., 2000).

The assumption that the attributes of prestige products are infrequently purchased, require a higher level of interest and knowledge that are strongly relate to the person self-concept, and social identity. This assumption distinguishes themselves from others, and serves as a symbolic marker of group membership (Dawson, 1988). Prestige sensitivity consumers demand a high-involvement of purchasing process that necessitates the continual process of search, purchase, savoring, using and finally replacing goods (Vigneron and Johnson, 1999). This process is masking what is ultimately a search for social integration, which displays prestigious power and status. The reassurances consumers derive from prestige products actually enhance the value and pleasure of anticipation when they consume these types of products.

Buying imported products alleviate those consumers who are looking for prestigious products. Consumers prefer to purchase imported products because they are confident in the judgment of style, quality, design, exclusiveness, uniqueness, popular, expensiveness, precious, rare, limited, and scarcity of the kinds. The uniqueness and limited availability of imported products stimulates the pervasion of values by dramatizing the status satisfactions at the deepest levels through the products ownership. Social value of prestige products comes from the exclusiveness of limited product alternatives, and satisfaction arises in large part from a product's value.
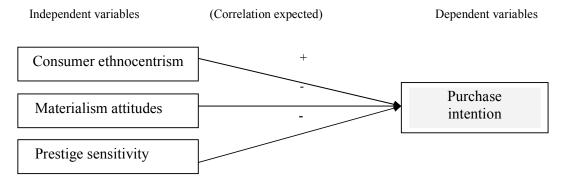
The imported products could be inferred as the highest level of prestigious products encompassing several physical and psychological values such as perceived conspicuous, unique, social, hedonic, and quality. Consumers with preferences for high prestige may use relatively higher prices to infer prestige and quality (Lichtenstein et al., 1993; McGowan and Strenquist, 1998). Consumers are motivated by a desire to impress others with their ability to pay particularity high prices in exchange for superior quality of prestigious products (Braun and Wicklund, 1989). Prestige brand suggest superior product characteristics and quality performance whereby people relate the prestige product according to their personal values reassurance.

The increase in Malaysian consumers' disposable income inspires their purchasing power to buy imported products that represent prestigious symbols. To maintain their prestigious status, Malaysian consumers buy products with the advertising promise them the high value for social status from all over the world (Netemeyer, Burton, & Lichtenstein, 1995). As a matter of fact, consumers who learn about other cultures are likely to have the most profound effect on knowledge about other people lifestyles and increase receptivity towards foreign products. This receptivity creates positive attitudes on purchase intention of imported versus domestic products (Nijssen and Douglas, 1999).
The foregoing discussion leads to the following hypothesis:

> H3: Prestige sensitivity consumers are negatively related to purchase intentions of Malaysian-made products.

Figure 1: Correlation With Purchase Intention

Independent variables   (Correlation expected)   Dependent variables

The hypotheses were subjected to stepwise multiple regression analysis to find out the relationship of the predictor variables with the criterion variables. The consumers' purchase intention will be used as the ultimate dependent variable in this study.

The general structural equation that was employed to explain the relationship is:

Purchase intention $\quad\quad = \alpha + \beta^1$Consumer ethnocentrism $+ \beta^2$Material attitude $+ \beta^3$Prestige sensitivity $+ \varepsilon$

where:

Purchase intention $\quad\quad$ = purchase probability associated with an intention category at the percentage of individuals that will actually buy product

Consumer ethnocentrism = consumers' belief about the appropriateness and morality of purchasing foreign-made products

Material attitude $\quad\quad$ = value held by an individual, who embodies the importance one attaches to material possessions and their acquisition as a necessary or desirable form of conduct to reach desired end states including happiness

Prestige sensitivity $\quad\quad$ = favorable perceptions of the price cue based on feelings of prominence and status that higher prices signal to other people about the purchaser

α and βI $\quad\quad$ = constant/parameters to be estimated, i = 1 to 3, and

ε $\quad\quad$ = disturbance term

RESULTS

Instrument Characteristics

Before proceeding with the analysis, the items comprising the independent and dependent variables were examined for reliability. We used Cronbach's alpha to calculate the reliability for consumer ethnocentrism, prestige sensitivity, and materialism attitude on purchase intention (Table 2). Reliability coefficients ranged from .64 to .91 and were considered to be appropriate for further analysis. One may notice that the reliability for variables do achieve desired levels, with the exception of purchase intention.

The consistency of consumer ethnocentrism constructs ($\alpha = 0.91$) with previously reported research show high level of reliabilities alpha ranged from 0.91 to 0.96 (Shimp and Sharma, 1987; Netemeyer et al., 1991; Durvasula et al., 1992), thus giving evidence of internal consistency. Reported reliabilities for the materialism scale were $\alpha. = 84$ (Richins and Dawson, 1992) are consistent with the reliability reported in the current study (Table 2). The reliability for prestige sensitivity in the previous studies ($\alpha = .78$ to .90) lends support the use of this scale as measures in the current study with the $\alpha = .86$ (Table 2). We reverse code three items and deleted one item from purchase intention to improve reliability. Due to the low reliability of the prestige sensitivity items, the researchers reviewed each item critically, one at a time, to examine its theoretical appropriateness. Given that previous research does not provide clear direction on the purchase intention, the reliability analysis for the dependent variables, purchase intentions, was accepted at $\alpha = .64$.

Table 2: The Descriptive Statistics and the Reliability of the Independent and Dependent Variables

Variables	Mean	Standard Deviation	Alpha
Consumer ethnocentrism	3.19	.68	.91
Materialism attitude	2.88	.73	.84
Prestige sensitivity	2.90	.63	.86
Purchase intention	3.97	.68	.64

Sample Characteristics

A following step is taken by sending a reminding note through emailing address to respondents who are not filled and returned their questionnaires on 12 January 2004. Descriptive data statistics are relied upon to identify the respondents' characteristics. Of the 800 questionnaires distributed to the respondents, 274 (34.3 %) were returned. Of the entire returned questionnaire, 266 (33.3%) responses were usable for data analysis while 8 were discarded due to missing answers or apparent inappropriate response patterns. The percentage of respondents of the faculty staff of the overall population was identified through their position. Of the entire return questionnaire the percentage for professor/associate professor, lecturer, and instructor/tutor respective are; (33.0%, 33.3%, and 31.6%) (Table 3). The sample is assumed to be representative of the population. The detailed demographic information of the sample is presented in Table 4.

Table 3: Summaries the Data on the Questionnaires Distributed

Respondent position	Sent	Return
Professor/Associate professor	103	34(33.0%)
Lecturer	602	202(33.3%)
Instructor/tutor	95	30(31.6%)
NA (Discarded)		8(2.92%)
Total	800	274(34.3%)

Table 4: Profiles of Respondents

Variable	Percentage	Frequency
Gender		
Male	51.9	138
Female	48.1	128
Age		
20-40	72.9	194
41-60	23.3	62
Above 60	3.8	10
Marital status		
Single	26.4	70
Married	73.2	194
Single parents	0.4	1
Income		
RM1000-RM5000	84.5	224
RM5001-RM9000	13.6	36
Above RM9001	1.9	5
Position		
Professor	0.4	2
Professor with position held	0.4	1
Associate professor	8.7	23
Associate professor with position held	3.0	8
Lecturer	65.7	174
Lecturer with position held	10.6	28
Instructor/tutor	11.3	30

The gender of respondents was fairly evenly distributed with males (51.9%) and females (48.1%). The sample was composed of more age groups of 20-40 years old (72.9%). A greater percentage of the sample indicated that they are married (73.2%) versus single (26.4%). The majority of respondents (84.5%) had income between RM1000-RM5000. The largest group of respondent was lecturer (65.7%).

Non-Response Bias

As discussed earlier, a low response rate might give rise to a problem of non-response bias that might in turn cause the data to be unreliable or invalid. To establish the reliability and validity of the data, an effort was made to test the possible presence of non-response bias. Oppenheim (1992) suggested that one practical way to detect non-response bias is to compare the answers to the questionnaire given by early respondents with those of late respondents. In this study, the first 30 and the latest 30 questionnaires received from respondents respectively were categorized as earlier and late.

T-test was done to test the mean differences among the four variables (consumer ethnocentrism, materialism attitude, prestige sensitivity, and purchase intention). T-tests indicated no significant differences in the respondents' scores on variables from the two groups. The findings suggest that non-respondent would generally have the same opinion as those who responded. Thus, the data are considered representative of the population of both groups of respondents, and generalization may be made.

Hypothesis Testing

Bivariate analysis (Pearson correlation) was undertaken to examine the relationships in the research hypotheses. The result of the analysis is presented in Table 5.

Table 5: Summary of Hypothesis Test

Hypothesis	Hypothesized Direction	Result	Support
H1: Ethnocentric consumers are positively related to purchase intentions of Malaysian-made products.	+ve	+ve	Supported
H2: Materialistic attitude consumers are negatively related to purchase intentions of Malaysian-made products.	-ve	-ve	Supported
H3: Prestige sensitivity consumers are negatively related to purchase intentions of Malaysian-made products.	-ve	-ve	Supported

Relationship Between Consumer Ethnocentrism And Purchase Intention

Hypothesis 1 predicted a positive relationship between consumer ethnocentrism and purchase intention of Malaysian made products. The results of this analysis yield support with a correlation of $r = .000$ (Table 5). The extant literature indicates largely that ethnocentrism was found to be positively related to preference of domestic products over imported products (Sharma and Shimp, 1987). Yet, lack of statistically significant findings in the current study may be due to low interest in patriotic consumption (Kim and Psyarchik, 2000). Interestingly, the relationship is not significant although support detected that consumers show a high score in CETSCALE. This finding did not consistent with most of the relevant studies that show higher tendency for consumers to purchase domestic products. This give the evidence that even if Malaysian consumers are ethnocentric, yet they perceived that it is not wrong to purchase imported products. Our finding is consistent with Marcoux et al., (1997) who found that the effect of younger women having a low interest in patriotic consumption, inclined to use goods to aspire to a social status show a preference for clothing made in Western countries rather than local one. O'Cass and Lim's (2002) study found that young Singaporean consumers are more favorable on Western products (imported) than Eastern products (includes those Made in Singapore).

Relationship Between Materialism Attitude And Purchase Intention

Hypothesis 2 proposed a negative relationship between materialism attitude and purchase intentions of Malaysian-made products. Our results revealed support (r = -.136) at p = 0.05 level (Table 5). The relationship showed a negative correlation. This significant correlation may be possibly because they are favorably evaluate imported products with the assumption that imported products offer them the first-rate items, which associated with image status, wealth and personal achievement. The result support the idea that purchased imported

product would represent their attitude toward materialism and believe that possessions are an essential element of success to a person's existence, and an important role in achieving happiness in their lifetime.

Relationship Between Prestige Sensitivity And Purchase Intention

Hypothesis 3 predicted that prestige sensitivity would be negatively related to purchase intentions of Malaysian-made product. As the result shown in Table 5 this hypothesis is supported ($r = -.145$) at $p = 0.05$ level. As expected, the impact of prestige sensitivity on reluctance to purchase Malaysian-made products was due to believe that imported product make them feel classy and good about themselves. As people rate other people by the value of their prestige of products usage, buying imported product help to express their prestige status. The results indicate that Malaysian consumers prefer to purchase imported products in enhancing and aspiring their social status and prestigious lifestyles.

Table 6: Pearson Correlation Coefficients

Variables	Purchase intentions	Consumer ethnocentrism	Materialistic attitude	Prestige sensitivity
Purchase intention	1.000			
Consumer ethnocentrism	.000	1.000		
Material attitude	-.136*	.264**	1.000	
Prestige sensitivity	- .145*	.445**	.801**	1.000

Note:
**. Correlation is significant at the 0.01 level (2-tailed).
 *. Correlation is significant at the 0.05 level (2-tailed).

In order to determine the effect of consumer ethnocentrism, materialism attitude and prestige sensitivity on purchase intention, correlation and stepwise regression analyses were used to analyze the data. In the regression model, purchase intention was the dependent variable. However, in applying the regression model, a problem of multicollinearity may present among the variables. To determine the presence of any severe multicollinearity problems, each of the variables was alternately regressed on all other variables.

According to Kleinbaum, Kupper and Muller (1988), a model is said to suffer a severe problem of multicollinearity if the correlation is high or above $r = .9$. The possibility of the presence of this problem was initially determined in Table 6, which shows the correlation matrix of variables using Pearson correlation coefficients. As noted in Table 6, there was a high correlation between the two sizes variables (prestige sensitivity and material attitude). This high correlation signaled multicollinearity that might be a problem if both variables were included simultaneously in a regression model. However, the result of Deeter-Schmelz et al.'s (2000) study support our research's contention that material success, while distinct from prestige shopping, is a construct that expect to correlate positively and significantly with components of the prestige-shopping profile.

The data were subjected to stepwise multiple regression analysis to find out the relationship of the predictor variables with the criterion variables. The results found and apply for general structural equation that was employed to explain the association is:

Purchase intention $= \alpha + \beta^1$Consumer ethnocentrism $+ \beta^2$Material attitude $+ \beta^3$Prestige sensitivity $+ \varepsilon$

As previously mentioned, given the poor fit of the model, the researchers reviewed each item critically, one at a time, to examine its theoretical appropriateness.

Table 7: Summary of Stepwise Regression Result

Model	Variable entered	R2	Adjusted R Square	F-ratio
1	Consumer ethnocentrism	.053	.049	14.13
2	Material attitude	.068	.061	9.29

DISCUSSION AND CONCLUSION

The current study provides some implications for future research. The dimensions used in the current study involve consumer ethnocentrism, materialism attitudes, prestige sensitivity, and purchase intention. Ethnocentrism based on nationalism does not necessarily affect consumer perceptions of product quality and purchase intention. Also of importance is social status demonstration and interpersonal mediation of two variables; materialism attitudes and prestige sensitivity. Both of these two variables derive from the meanings of the conspicuous consumption scale. This finding provides some lesson and other immediate implications for marketing and retail management. A buyer, merchandiser, category and store manager, and salespeople make decisions regarding the mix of product categories are required a complete information and a thoroughly understanding of how consumer ethnocentrism, materialism attitude, prestige sensitivity, and purchase intention are likely to be perceived by a targeted market.

Consumer Ethnocentrism

The concept of consumer ethnocentrism may improve our understanding of consumer behavior, and why certain segments of consumer prefer domestic products, whereas others do not discriminate between domestic and imported products (Piron, 2002). Along with increased patriotism and heavy emphasis on cultural and ethnic identity, consumers' ethnocentrism will be a potent force in the global business environment in the years to come (Kucukemiroglu, 1999).

Deciding on the degree of ethnocentrism with which the companies wish to be associated and the geographical limits of its impact may be a factor in retail management achievement. These reasons support the interest in advancing as regards measurement instruments and, in addition, in the geographical delimitation of the effect of consumer ethnocentrism, which varies depending on product types and categories. For instance, ethnocentrism based on nationalism does not necessarily affect perceptions of product quality and purchase intention on domestic product (Watson and Wright, 2000). For some product, consumers certainly might rate home country product lower than outsider would rate them (Speece and Pinkaeo, 2002).

Understanding whether the level of ethnocentrism differentiate customer attitude towards Malaysian made and imported products is useful for the development of marketing strategies. Although Malaysian consumers are ethnocentric does not mean that they would only buy local made products. The implication is that knowledge of consumer ethnocentric tendencies could be used to position Malaysian-made products by customizing the marketing mix and product categories. This may force marketers and retailers to intensively promote more campaign for buying Malaysian product. These practices should help alleviate ethnocentric consumer to aware about the Malaysian-made product.

Fast changed in globalization lead consumer to demand a rapid product invention of imported product to satisfy their consumption needs (Kim and Psyarchik, 2000; Suh and Kwon, 2002). Thus, the result presented here provide a picture of those consumers who are likely to eschew and denigrate all foreign goods, versus those consumers who may view is not wrong to buy imported (Klein and Ettenson, 1999). Understanding this behavior require managers to build intensive marketing planning and consider how their marketing communications influence the consumers. This would help them to strategically identify and target those consumers who are most likely to respond favorably to marketing communications, which focus on domestic production or domestic imported themes (Klein and Ettenson, 1999).

Materialism Attitude

Materialism is associated with a greater drive to acquire the products that marketers provide for consumers. The ability of material possessions to serve different symbolic roles could be a basis for the success of some products and promotional campaigns tactics. It appears that a low interest in purchasing local product is the determining factor of the preference towards imported products. This is because materialism affect consumer attitude to focus on selection of products that truly related to acquisition and place high priority on their ownership and value indicators (Ryan and Dziurawiec, 2000).

The improvement of Malaysian standard of living and increase in income level has facilitated higher levels of consumption. These forces may therefore increase the general standard of living where materialism prevails to purchase imported products versus Malaysian-made products. Purchasing limited choice of imported products, make it becomes uniqueness, rare and precious in comparing to domestic products. This uniqueness of imported products helps them to distinguish themselves from others to show their best interest in materialism accumulation.

The relationship is likely to hold in countries like Malaysia with relatively open markets, where consumers have choice and information for making selection of imported product. Another possibility is that recently Malaysia has been an international center for trade and commerce with the establishment of international events, and increases in duty free outlets make people take for granted to purchase imported products. This situation may be tied to the fact that consumers will be more accepting of imported products as globalization is accelerated. Further, this information will enable international marketers to better understand how their offerings will be perceived in different segments of the global market, and to strategically target and position their products accordingly.

Prestige sensitivity

Shopping behavior based on the symbolic prestige qualities of products has long been accepted as ubiquitous in nature. The success of prestige strategy depends on the ability of marketers to identify and target consumers who purchase products. Targeting consumers who value prestige requires an understanding of the factors that underlie the acquisition of prestigious symbols. As the utility of prestige products may be to display wealth and power, one could consider that highly visible prestige-brands would dominate the conscious segment of the consumer (Vigneron and Johnson, 1999). Given the efforts of some retailers to position their products based on some notion of prestige, a reliable and valid measure of the set of factors that underlie prestige purchasing would be useful for them to identify prestige market segments and understanding what prestige means to consumers (Deeter-Schmelz et al., 2000).

We must understand the nature of prestige-shopping behavior before we can effectively quantify various prestige levels segments for any product category; more precisely in targeting niche market of prestigious consumer, and design appropriate prestige positioning strategies. As such, the prestige sensitivity profile resulting from our study should have several benefits to retail practitioners. The prestige sensitivity profile also could be used as a market segmentation tool and could help to facilitate more accurate estimates of the size of various prestige segments within a given area. Various prestige level gaps exist within a geographic require managers to justify a location for prestigious retail outlet. The estimates are critical with regards to store location, product mix, and positioning decisions (Dawson, 1988).

Prestige sensitivity also highlights the strategic importance of integrated marketing communications to ensure that the company sends out a consistent, clear message about the product's price, as its one of the indicator for product prestige sensitivity. Consumers who value prestige are more likely to pay higher for merchandise perceived as highly prestigious and pay higher margins demanded by retail outlets perceived as selective or exclusive distributors of that merchandise (Dawson, 1988). Exclusiveness and luxury brands are among the factors that influence prestige sensitivity consumer to purchase more of imported products over Malaysian-made products. This is because symbolic consumption is particularly relevant to stores using prestige brand. Brands and stores are sometimes repositioned to a higher prestige niche as a means to attract new markets and improve profitability (Deeter-Schmelz et al., 2000; Daneshvary and Schew, 2000).

In particular, more consumers are moving away from traditional low-cost local products to up market of luxury brands. This desire to impress others via the appearance of their prestigious status suggests an opportunity for imported products marketers to develop their product lines. The relative symbolic impact of friends, admired others, and wealthy people on prestige shopping might vary substantially among trade areas and segments defined by other demographic variables. Such knowledge would be very useful in helping retailers to improve profitability through their promotional planning, store location, number of outlet, and merchandising decisions.

Research Recommendation

For the research finding, it seems clear that ethnocentrism, materialistic attitude, and prestige sensitivity are part of consumers' emotional factors that played an important role in determining the consumers' purchase intention on Malaysian made and imported products. Trends towards the globalization of markets are fueled by changes in consumer knowledge, attitudes, behavior, and preferences (Suh and Kwon, 2002). Among other things, the findings provide evidence that there are differences in the attitudes and intention of respondents towards Malaysian-made-products. This finding also provides useful information for marketers of local goods as well as foreign marketers exporting to Malaysia in selecting their target markets and formulating appropriate marketing strategies.

The availability of numerous imported products categories in developing countries like Malaysia is tremendous, hence making the competition in the domestic markets becoming more rigorous and giving more choices to consumers (Abdul Razak et al., 2002). Thus Malaysian-made products begin to face stiffer competition with those imported items in capturing the spending budget of Malaysian consumers (Abdul Razak et al., 2002). Today's, we could observe that a number of Malaysian consumers are become familiar and more willing to consider imported products as an alternative to Malaysian-made goods.

Coupled with what marketers and manufacturers already know about the profiles of their target customers, understanding the antecedent of ethnocentric emotion, materialism attitude, and prestige sensitivity will enable them to segment and control their domestic markets more effectively. Marketers will be able to strategically identify and target those consumers who are most likely to respond favorably to marketing communications, which portray Malaysian-made products and local themes. Comparative advertising campaigns targeted at Malaysian consumers, with particular emphasis on products that reflect the local cultural values might enhance the consumers' perceptions of domestic products quality. For international marketers, this information will enable them to better understand how their offerings will be perceived by different segments of Malaysian market.

From a managerial perspective, the results are instructive for local and international marketers and manufacturers focus on educated consumers in Malaysia. Marketers of Malaysian-made products who compete with those international marketers may use the theme of patriotism in advertising and promotion. For international marketers, they should avoid sensitive aspect of patriotism and focus on social status demonstration.

In general, our findings suggest that, retailers of Malaysian-made products should adopt different strategies in different product categories to be successful in inducing the reluctant consumers to purchase local products. If consumers are reluctant to buy Malaysian-made product solely due to the perception of poor product quality, less prestigious, not represent achievement in material possession, and become globalize through their own initiatives and purchase more of imported products, the market penetration for Malaysian-made products may become relatively hard vis-a-vis easier for imported products.

Limitation and future research

Several limitations are, however, inherent in this study and these can limit the generalizability of the findings. A first limitation concerns external validity. A sample of faculty staff is not representative of the whole population. Since all respondents are white collars group of workers who having high level of education, thus the results cannot generalize to other groups of Malaysian consumers. Highly educated and cultural openness of the sample affects their ethnocentric, which make them tend to purchase more on imported product. Additionally, respondents who are faculty staff members are more urbanized, have a higher income, and they are experienced in study and travel abroad, which expose them more to foreign products, openness to cosmopolitan views and receptive to purchase imported products.

The second limitation is that in the future it might be interesting to observe if any of the demographic variables of the respondents might influence the purchase intention. Future research should be conducted using demographic variables as one of the independent variables. It might be interesting to observe if respondents and any of the demographic variables of the respondents might influence their purchase intention of Malaysian-made products.

The third limitation is that the current study examined a single product category and subjects were not provided with a context in which to frame their decisions about the importance of the products. Although furniture was chosen because other research has shown it to be useful for manipulating self-presentation, some of the results may be due to product choice and may not be generalizable to other product categories. Is it distinguishable with purchase intention to buy Malaysian-made products when they are assesses with many product categories? However, many other studies have used single products, and particularly fashion clothing (Browne and Kaldenberg, 1997; Flynn & Goldsmith, 1993; O'Cass, 2002).

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REFERENCES

Abdul Razak K., Safiek, M., & Md Nor, O. (2002). Ethnocentrism orientation and choice decisions of Malaysian consumers: the effects of sociocultural and demographic factors. *Asia Pacific Management Review*, 7(4), 553-572.

Belk, R. (1984). Three scales to measure constructs related to materialism reliability, validity, and relationships to measure happiness. *Advances Consumer Research*, 11, 291-297.

Belk, R. (1995). Collecting as luxury consumption: some effects on individuals and households. *Journal of Economic Psychology*, 16 (September), 477-490.

Berkman, H., & Gilson, C. (1986). *Consumer behavior: concepts and strategies* (3rd ed., pp. 160-170). Boston: Kent.

Braun, O., & Wicklund, R.A. (1989). Psychological antecedents of conspicuous consumption. *Journal of Economic Psychology*, 10, 161-187.

Browne, B.A., Kaldenberg, D.O. (1997). Conceptualizing self-monitoring: links to materiasm and product involvement. *Journal of Consumer Marketing*, 14(1), 43-54.

Caruana, A. (1996). The effects of dogmatism and social class variables on consumer ethnocentrism in Malta. *Marketing Intelligence & Planning*, 14(4), 39-44.

Daneshvary, R., & Schwer, R.K. (2000). The association endorsement and consumers' intention to purchase. *Journal of Consumer Marketing*, 17(3), 203-213.

Dawson, S. (1988). An exploration of the store prestige hierarchy: reification, power, and perceptions. *Journal of Retailing*, 64(Summer), 133-152

Deeter-Schmelz, D.R., Moore, J.N., Goebel, D.J. (2000). Prestige clothing shopping by consumers: A confirmatory assessment and refinement of the Precon scale with managerial implications. *Journal of Marketing Theory and Practice*, 8(4), 43-56.

Dittmar, H. (1992). *The Social Psychology of Material Possessions*. St. Martin's Press, NY.

Durvasula, S., Andrews, J.C., Netemeyer, R.G. (1992). A cross-cultural comparison of consumers ethnocentrism in the United States and Russia. *Proceedings of the American Marketing Association*, Summer, 511-512.

Fishbein M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research*. Addison-Wesley Publication Company. (Reading, Massachuset).

Flynn, L., & Goldsmith, R. (1993). A causal model of consumer involvement: replication and critique. *Journal of Social Behavior and Personality*, 8, 129-142.

Han, C.M. (1988). The role of consumer patriotism in the choice of domestic versus foreign products. *Journal of Advertising Research*, 28(3), 25-32.

Herche, J. (1994). Ethnocentric tendencies, marketing strategy and import purchase behavior. *International Marketing Review*, 11(3), 4-16

Heisey, F.L. (1990). Perceived quality and predicted price: use of the minimum information environment in evaluating apparel. *Clothing and Textiles Research Journal*, 8(Summer), 22-28.

Herrmann, A., Huber, F., & Coulter, R.H. (1997). Product and service bundling decisions and their effects on purchase intention. *Pricing Strategy & Practice*, 5(3), 99-107.

Huddleston, P., & Good, L.K. (1995). Ethnocentrism of Polish and Russian consumers: are feelings and intentions related. *International Marketing Review*, 12(5), 35-48.

Huddleston, P., Good, L.K., & Stoel, L. (2001). Consumer ethnocentrism, product necessity and Polish consumers' perceptions of quality. *International Journal of Retail & Distribution Management*, 29(5), 236-246.

Jamieson, L.F., & Frank, M.B. (1989). Adjusting stated purchase intention measures to predict trial purchase of new products: a comparison of models and methods. *Journal of Marketing Research*, 26(August), 336-345.

Jin, B., & Strenquist, B. (2003). The influence of retail environment on price perceptions: an exploratory study of US and Korean students. *International Marketing Review*, 20(6), 643-660.

Kasper, H. (1999). *Services Marketing Management: An International Perspective*. John Wiley and Sons, New York, NY.

Kaynak, E., & Kara, A. (2002). Consumer perceptions of foreign products: an analysis of product-country images and ethnocentrism. *European Journal of Marketing*, 36(7/8), 928-949.

Kim, S., & Psyarchik, D.T. (2000). Predicting purchase intentions for uni-national and bi-national products. *International Journal of Retail & Distribution Management*, 28(6), 280-291.

Klein, J.G., & Ettenson, R. (1999). Consumer animosity and consumer ethnocentrism: an anlysis of unique antecedents. *Journal of International Consumer Marketing*, 11(4), 5-24.

Kleinbaum, D.G., Kupper, L.L., Muller, K.E. (1988). *Applied Regression Analysis and Other Multivariable Methods*. PWS-Kent Publishing Company, Boston.

Kua, A.K., Kwon, J.T., Jiun, T.S, & Wirtz, J. (2000). The influence of materialistic inclination on values, life satisfaction and aspirations: an empirical analysis. *Social Indicators Research*, 49, 317-333.

Kucukemiroglu, O. (1999). Market segmentation by using consumer lifestyle dimensions and ethnocentrism. *European Journal of Marketing*, 33(5/6), 470-487.

Lichtenstein, D.R., Ridgway, N.M., & Burton, S. (1993). Price perceptions and consumer shopping behavior: a field study. *Journal of Marketing Research*, 30 (May), 234-245.

Levine, R.A., & Campbell, D.T., (1974). *Ethnocentrism: theories of conflict. Ethnic attitudes and group behavior*. Jon Wiley, New York, NY.

Martinez, T.L., Zapata, J.A.I., & Garcia, S.B. (2000). Consumer ethnocentrism measurement – an assessment of the reliability and validity of the CETSCALE in Spain. *European Journal of Marketing*, 34(11/12), 1353-1374.

Marcoux, J.S., Filiatrault, P., & Cheron, E. (1997). The attitudes underlying preferences of young urban educated Polish consumers towards products made in Western countries. *Journal of International Consumer Management*, 9(4), 5-29.

McGowan, K.M., & Sternquist, B.J. (1998). Dimensions of price as a marketing universal: a comparison of Japanese and U.S consumers. *Journal of International Marketing*, 6(4), 49-65.

Moschis, G.P. (1981). *Socialization perspectives and consumer behavior*. Marketing Review, Ben Enis and Kenneth Roering, eds., Chicago: American Marketing Association, 43-56. Mosteller, F., & Youtz, C. (1990). Quantifying Probabilistic Expressions. *Statistical Science*.

Netemeyer, R.G; Durvasula, S., Lichtenstein, D.R., (1991). Attitude toward a country (CETSCALE) (1991). *Marketing scales handbook: A compilation of multi-item measures*. (3 vol. set.) Chicago: American Marketing Association, 2, 40-41.

Netemeyer, R.G., Burton, S., & Lichtenstein, D.R. (1995). Traits aspects of vanity: measurement and relevance to consumer behavior. *Journal of Consumer Research*, 21(4), 612-626.

Nijssen, E.J, & Douglas, S.P. (1999). Attitudes toward the purchase of foreign products: extending the model. 1-7 retrieved on 3rd January 2004 from http://pages.stern.nyu.edu/~sdouglas/rpubs/attitudes.html

Nunnally, J. (1978). *Psychometris theory*: New York: McGrawHill.

O'Cass, A., & Lim, K. (2002). Towards understanding the young consumer's brand associations and ethnocentrism in the Lion's Port. *Psychology & Marketing*, 19(9), 759-768.

Oppenheim, A.N. (1992). *Questionnaire design, interviewing and attitude measurement*. London: Printer Publishers.

O'Shaughnessy, J.O., & O'Shaughnessy, N.J. (2002). Marketing, the consumer society and hedonism. *European Journal of Marketing*, 36(5/6), 524-547.

Piron, F. (2002). International outshopping and ethnocentrism. *European Journal of Marketing,* 36(1/2), 189-210.

Preiswerk, R., & Perrot, D. (1978). *Ethnocentrism and History: Africa, Asia & India America in Western Textbooks*. NOK Publishers International Limited, New York, NY.

Prendergast, G, & Wong, C. (2003). Parental influence on the purchase of luxury brands of infant apparel: an exploratory study in Hong Kong. *Journal of Consumer Marketing*, 20(2), 157-169.

Richins, M.L., & Dawson, S. (1992). Measuring material values: a preliminary report of scale development. *Advances in Consumer Research*, 17, 169-175.

Richins, M.L., & Rudmin, F.W. (1994). Materialism and economic psychology. *Journal of Economic Psychology*, 15, 217-231.

Ryan, L., & Dziurawiec, S. (2001). Materialism and its relationship to life satisfaction. *Social Indicators Research*, 55(2), 185-197.

Sekaran, U. (1992). *Research Method for Business, 2nd Ed.*. New York: John Wiley.

Shimp, T., & Sharma, S. (1987). Consumer ethnocentrism: construction and validation of the CETSCALE. *Journal of Marketing Research*, 24, 280-289.

Shimp, T., Sharma, S., & Shin, J., (1995). Consumer ethnocentrism, a test of antecedents and moderators. *Journal of the Academy of Marketing Science*, 23(1), 26-37.

Speece, M., & Pinkaeo, K. (2002). Service expectations and consumer ethnocentrism. *Australasian Marketing Journal*, 10(3), 59-75.

Suh, T., & Kwon, I. (2002). Globalization and reluctant buyers. *International Marketing Review*, 19(6), 663-680.

Taschian, A., Slama, M.E., & Taschian, R. (1984). Measuring attitude towards energy conservation. *Journal of Public Policy & Marketing*, 3(2), 134-148.

Vaidyanathan, R., Aggarwal, P., Stem, D.E., Muehling, D.D., Umesh, U.N. (2000). Deal evaluation and purchase intention: the impact of aspirational and market-based internal reference prices. *The Journal of Product & Brand Management*, 9(3), 179-192.

Vigneron, F., & Johnson, L.W. (1999). A review and a conceptual framework of prestige-seeking consumer behavior. *Academy of Marketing Science Review*, 1999.

Wass, V., & Wells, P. (1994). *Principles and practice in business and management research*. Hants: Dartmouth.

Watson, J.J., & Wright, K. (2000). Consumer ethnocentrism and attitudes toward domestic and foreign products. *European Journal of Marketing*, 34(9/10), 1149-1166.

Whitlar, D.B., Geurts, M.D., & Swenson, M.J. (1993). New product forecasting with a purchase intention survey. *The Journal of Business Forecasting Methods Systems & Systems*, 12(3), 1-18.

Do Consumers' Demographic Profile Affect Use Nutrition Information Labels on Food Products? (Tehran-Iran)

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ABSTRACT

Nutrition labels on food packages are designed to promote and protect public health by providing nutrition information so that consumers can be informed regarding the nutrient content and ingredients content on the food products. Therefore, an understanding of consumers' perception and attitudes towards nutrition information on food packages has important implications for public health and nutrition education. This study explores the association between reading nutrition labels and demographic factors on manufactured food packages. Health behaviour's literatures suggest that perceived benefits and costs of using nutrition labels and perceived capability of using labels are associated with consumers' profile. The relationship between reading nutrition information and consumers behaviour was estimated by logistic regressions. Survey was undertaken, 1200 respondents were interviewed vie questionnaires to gather information regarding their perception towards nutrition labelling. The results show that there is strong relationship between consumers' socio-economic profile and reading nutrition labels.

INTRODUCTION

Iran has invested about USD500 million in establishing more than 300 food-processing plants. Food processing in its modern sense is relatively new to Iran and the government is taking steps to promote this aspect of agro-industrial growth including the granting of low interest loans for investors. With population of near 61 million and per capita GDP of US$1800.974, the potential of food processed and food production is tremendous. New investment in food processing industry has been on the rise and one of the main concerns of Iranian government is to insure food safety, quality and the introductions of assurance system in order to meet consumers' demand for health and wholesome food product. Due to the recent development in food industries in Iran and the increased dependency on packaged foods, there is rising need for providing nutrition information on food labels to enable Iranians consumers and others to make informed food purchasing decisions for healthy living. Nutrition labelling is to be considered as the regulatory status of foods that can be made regarding to health promoting properties, with emphasis on the situation of the manufactured products. According to Berner (1998) nutrition label can approve the health claim, which made by producers in terms of healthy products. The nutrition labels provide important information to help people make food-purchasing decision in an informed manner. Increasing interests in the relationship between diet and health has led to an ever-sharper focus on nutritional aspects of the food supply. Today people are becoming increasingly health conscious and are making demands for more nutritionally well balanced diets than any time in history (Levy et. al, 1998). The growth in consumer demand for high-quality products is causing changes in the functioning of the food processing and marketing sector. Like the other countries, there is need to established regulatory bodies in Iran, to monitor nutrition labelling in food manufacturing to ensure that whatever being claimed is accurate and true. At the same time designing nutrition labelling is a policy to achieve a social objective like a healthier population (Golan, 2001).

HISTORICAL DEVELOPMENT OF NUTRITION LABELLING

The US was one the first country that introduced nutrition labelling. In the US there are three main groups of legislators that cover food labelling and nutrition fact labelling for the purpose of protecting consumer's interests: United State Department of Agriculture (USDA), Food & Drug Administration (FDA) and Nutrition Labelling and Education Act (NLEA). Under the provision of the new Act, by May 1994 all of the food manufacturing companies were required to use the new food and nutrition label as a mandatory program. A key element of the new nutrition label was the "Nutrition Facts" panel that gives consumers significant information about the nutritional content of foods. For example, the Percent Daily Value column tells consumers in bold print whether the food is low or high in the key nutrients, fat, saturated fat, cholesterol, sodium and

carbohydrates. In addition to "Nutrition Fact" panel, label claims like "lite" or "reduced fat" must meet standard definitions and must have reconfirmed in nutrition labels (Neuhouser *et. al.,* 1999).

After the US many countries have pursued programmes in nutrition information. In Canada, first, nutrition labelling was introduced to the food producers as a voluntary programme. However under the new published regulation in January 2003, for the most processed food, nutrition labelling accommodating is mandatory. In 1996 the Food Advisory Committee (FAC), United Kingdom completed its review of the British market for functional foods and the control of health claims. The scope of this was that they applied to all food and drinks, including food supplements. A food claim is defined in the draft as any statement, suggestions or implications in food labelling or advertising that food is beneficial to health. Because of the integral relation between food, health and the capacity of food labelling to convey information to consumers, Food Standards Australia New Zealand (FSANZ) has reviewed its food regulatory. FSANZ's primary objectives in developing food regulation are: the protection of public health and safety; the provision of adequate information relating to food to enable consumers to make informed choices; and the prevention of misleading or deceptive conduct (Lewis & Jefferson*, 2000). Asian countries are likely to embrace higher labelling standards. For example additional labelling laws may require open dating (to describe product freshness), unit pricing (to state the product cost in standard measurement unit), and percentage labelling (to show the percentage of each important ingredient) (Kotler, 1999). It is possible to consider the last point as nutrition facts. But still this programme is voluntary in the most countries in the world. Hong Kong specifics that manufactured food "shall be marked or labelled with a list of nutrient and listed in descending of weight and volume. It requires these labels only on manufactured food (Yeon, 2003). Malaysia in September 2003 developed the nutrition labelling issues, which required a wide range of manufactured product should accompany by nutrition label (WHO 2004).

NUTRITION LABELLING IN IRAN

In 2000, Iran Health Ministry and Iran Institute of Standard and Industrial Research of Iran (ISIRI) have made considerable progress, with regard to nutrition labelling. The authorities recognized that a comprehensive education initiative is necessary to support the appropriate use of this nutrition labels and maximize its potential to assist Iranians in making informed food choices. According to the nutrition labelling Act 2000, the nutrition labelling is voluntary for manufactured food products but if the health claim is made or the additives are used nutrition labels accommodation is mandatory on the food-manufactured package. With a good knowledge of the quality of the food people take, they will able to choose the best items. The nutrition labelling has become the most widely available source of nutrition and food content information used in Iran today. However, there is real potential for information on the food label to be confusing or even false or misleading. The problems like misbranding, illegal adulteration and false claims in food products have become important challenges to Iranian consumers. Previous research conducted, some of the barriers on reading the nutrition label by consumers were the difficulty of including reliable, representative data; inadequate information technology infrastructure among users; lack of user knowledge about nutrients and foods and weak literacy and mathematical skills among some users Cunningham *et. al.,* 2004). Health and diet related attitudes, special diet status, perceived importance of product attributes like nutrition and ease of preparation, race, gender, income, and body mass index are important factors affecting consumer's perception and beliefs about label used (Rodolfo 1999). Wailes (1996) found that women were more interested in reading label than men, checking the label for level of sugar, salt, cholesterol, fat, additives and nutrients. However nearly 50% of people said they did not believe the nutritional claims on the package, and 82% of buyers found it difficult to understand.

The main objective of the study is to find the relationship between the socio-economic of responders' profile and their acceptance of nutrition labels in manufactured food products. The problem here is people can understand and read nutrition labels; either can they influence by the source of nutrition information during purchasing food products or they find it as a way for the producers to promote the healthy food products. This study explores the impact of consumer's profile towards reading nutrition labels.

DATA AND METHODOLOGY

This study used data from a national survey of public attitudes towards various issues pertaining to the use of nutrition labels on manufactured food products. The questionnaire included subjects such attitudes toward nutrition labelling, perception toward nutrition labelling, awareness toward nutrition labelling and reason for using nutrition labelling. Information was also collected on consumers' socio-economic and value characteristics. These included data on age, education, income, gender, employment status and family size. The survey was conducted during April-May 2004, in Tehran province (Iran). One thousand and two hundred respondents were interviewed in order to obtain their attitudes and perceptions toward nutrition labelling. A

random sampling method was used in this research because it is necessary to obtain information from random groups of people who can provide the desired information.

A list of 30 questions relating to consumers perceptions and attitudes of nutrition labelling on the manufactured food were selected for this analysis. These questions explored how people valued the potential benefits that nutrition labels could bring to society, their perception of risks associated with the use of nutrition information labels, as well as their views about government associated with nutrition labelling development. Respondents were presented with various issues relating to the use of nutrition labels during food purchasing, and were asked to rate their agreement or disagreement on a scale of 1 to 5 (1 representing strong disagreement and 5 representing strong agreement).

Logistic model was used to predict the relationship between a binary response (yes/no) and socio-economic factors. Logistic regression analysis examines the influence of various factors on a dichotomous outcome by estimating the probability of the event's occurrence. The general form of regression model is as follows:

$$Z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 \ldots\ldots + \beta_p x_p$$

Where

Z = the linear combination
B_0 = Constant
$\beta_1, \beta_2, \ldots\ldots \beta_p$ are partial regression coefficients.
$x_1, x_2 \ldots\ldots x_p$ are the independent variables.

In this research there are two dependent variables:

Z_1 = Influenced by source of nutrition information during buying food product

Coded as follows:
0 = non- influenced
1= influenced

Z_2 = Reading nutrition labelling during purchasing manufactured food

Coded as follows:
0 = not reading
1 = reading

The independents variables are as follows:

x_1 : Area
x_2 : Gender
x_3 : Age
x_4 : Marital Status
x_5 : Education Levels
x_6: Income Status

RESULTS AND DISCUSSION

The empirical results and discussions are presented in the following two subsections. First, demographic analysis to find the background of the respondents, second, The next subsection predicts the relationship between a binary response (yes/no) and socio-economic factors by logistic regression.

Descriptive Analysis

Respondents were selected from all major parts of Tehran, Karaj, Lavasan, Damavand. Mostly they were selected in the super markets, universities, clinics, and companies and even randomly in the public locations. The respondents were asked about their residential area, which was urban (Tehran) and suburb (other areas). As shown in Table 1, the numbers of respondents from urban and suburb were 808 (67.3 percent) and 392 (32.7 percent) respectively. Most of the respondents were females 621(51.8percent) as compared to male 579 (48.3 percent). Majority (67.4) of respondents interviewed was under 40 of age and most of them (86.3) were

educated more than secondary school. From 1200 of the respondents, 500 (41.7 percent) were single and 700(58.3 percent) were married. Occupation is of the important point in decision-making and marketing study. The occupation in this study divided into seven levels. Most of respondents had working experiences in a various positions such as working for government sector 227 (18.9 percent), private sector 271 (22.6 percent), self-employed 216 (18 percent), retired 77 (6.4 percent) and the others were students 162(13.5 percent), house wives 168 (14 percent) and unemployed 79 (6.6 percent) as a group of people are not financially independent.

Table 1: Demographic Profile of Respondents

Characteristics	*Number*	*Percentage*
Residential area		
Urban	808	67.3
Suburb	392	32.7
Gender		
Female	604	50.3
Male	596	49.7
Age		
Below 20	64	5.3
20-30	428	35.7
31-40	329	27.4
41-50	214	17.8
51-60	117	9.8
Above 60	48	4.0
Marital status		
Single	500	41.7
Married	700	58.3
Education level		
Non-schooling	6	0.5
Primary school	47	3.9
Secondary school	100	8.3
Diploma	279	23.3
Bachelor	411	34.3
Master	230	19.2
PhD	81	6.8
Medical doctor	46	3.8
Occupation		
Public Sector	227	18.9
Privet Sector	271	22.6
Self-employed	216	18.0
Housewife	168	14.0
Retired	77	6.4
Unemployed	79	6.6
Student	162	13.5
Income x (1000)		
Below Rls2000	81	6.8
Rls2000- Rls4000	420	35.0
Rls4001- Rls6000	343	28.6
Rls6001- Rls8000	179	14.9
Rls8001- Rls10000	89	7.4
Above Rls10000	88	7.3

Number of person in household	1	2	3	4	5	1	2	3	4	5
		Number						Percent		
1-5 years	118	21	0	0	0	15.7	1.8	0	0	0
6-10 years	246	30	1	0	0	20.5	2.5	0.1	0	0
11-15 years	322	52	5	0	0	26.8	4.3	0.4	0	0
16-20 years	384	121	10	1	0	32.0	10.1	0.8	0.1	0
21-30years	449	197	8	2	1	37.4	16.4	0.7	0.1	0.2
31-40years	350	175	0	0	0	29.2	14.6	0	0	0
41-56 years	345	312	2	0	0	28.8	26.0	0	0	0
Above 56	209	119	1	0	0	17.4	9.9	0.1	0	0

In this study 763 (63.6 percent) respondents' income was between Rls2000 to Rls6000 (per month). This is the average range of income among Iranian family. On the other hand there were some families' income more than the average range Rls6001- Rls8000 179 (14.9 percent), Rls8001- Rls10000, 89(7.4 percent) and Rls10000 above, 88 (7.3 percent) and some less than 2000,81 (6.8 percent) of respondents. The number of household was between forty-on to fifty-six years old, 659 (54.8 percent) was the highest populations of respondents followed by twenty-one to thirty years old group, and 657 (43.8 percent). According to Statistical Centre of Iran the large group of population among Iranians is between twenty to thirty years old and also the average salary is between RLs2500 to Rls 3500.

Logistic Regression Analysis

In order to determine the relationship between demographic factors with reading nutrition labelling and purchasing food product influenced by sources of information, logic model was used. Thus, the analysis investigated two aspects such as analysis the significant demographic factors in determining the reading nutrition labelling and whether the consumers influence by the sources of information during purchasing food product.

The Relationship between Demographic Factors and Reading Nutrition Labels

According to the estimated model for the first dependent variable (reading nutrition labelling or not), there were four variables found significantly and positively related to the dependents variable to determine the choice between reading nutrition labelling or otherwise. Those were area, gender, and income and education level. The impact of residential area is significant which means the people who live in urban read more nutrition labelling than suburb areas. There is significant relationship appears between gender and reading nutrition labelling, which shows that female read more compared to men. The positive coefficient of indicated that education level (bachelor above) gives higher possibility to read nutrition labelling. The income coefficient was found positive and significant, it implies that an increase in income gives the higher prospect to read nutrition label. The results show that the estimated coefficient for above variables was positively significant at the 5 percent level. However the age of household (above ten) in the family were effecting the reading of nutrition label, but there was negative coefficient which, indicated an increase in the age and the members of family gives a lower probability to read the nutrition label according to study.

Other demographic variables, "age" and "marital status" were also included in logic model but the coefficients of these two were found insignificant. The results of the logic model analysis are shown in Table 2, Based on regression diagnostics, it seems the model is quit fit the data well. The percentage of right prediction was estimated to be 0.7025, which means the ratio of the probability that consumers will read nutrition labels, is 70.2%.

Table 2: Relationship between demographic factors and reading Nutrition label

Variables	Estimated coefficient	T-Ratio
Constant	-1.197	-3.55519 **
Area	0.446822	2.88238**
Gender	0.621754	4.536**
Age	0.00803527	1.23204
Income	0.000083	3.05243**
Education Level:		
Bachelor	1.45119	8.91331**
Master	1.47189	7.59513**
PhD	1.87671	6.10899**
Medical doc.	2.39632	5.14227**
Family house hold (age) :		
Child	0.0498894	0.465147
Adult	-0.248201	-4.51521**
Macffaden R^2	0.16042	
Log likelihood function	-687.9592	
% of right prediction	0.7025	

Note: ** indicates significant at 5 percent level

Relationship between demographic factors and influenced by source of information

Second dependent variables that was estimated by logic analysis, was whether consumers influence by information that they received from the sources of nutrition information during purchasing manufactured food. There were three variables found which had significant and positive relationship with dependence variable. They were gender, age and education level (only with bachelor and master degree). The positive coefficient of gender indicates that females are more influenced by what they found from sources of information during buying food products, either age which has positive impact on purchasing manufactured food based on gained nutrition information from resources. In the other world by increasing the age, people are more interested to buy their food product based on the nutrition information which gained from nutrition information sources. The level of education was another factor that related to peoples knowledge. According to survey only the educated groups who are holding bachelor and master was found significantly and positively related to the dependent variables. The results have not shown the significant relationship between very highly educated groups and dependent variable. This was happened because mostly highly educated groups (PhD and medical doctor) they have enough knowledge and information on the other hand it is very difficult for them to accept the things which are not approved academically or technically and they are also pre-occupied with work. How ever the member of household (in every age) in the family was found significant with variables, but there was negative coefficient which, indicated an increase in the members of family gives a lower probability to influenced by source of information. It could be related to the life cost. Normally by increase the member in the family the cost life is going high, so far for the average large families the chance to take healthy diet could not be very easy.

Other demographic variables, "income" and "marital status" were also included in logic model but the coefficients of these two were found insignificant. The results of the logic model analysis are shown in Table 3.

Table 3: Relationship between demographic factors and influenced by source of information

Variables	*Estimated coefficient*	*T-Ratio*
Constant	1.46493	3.44081**
Area	0.0169376	0.0834137
Gender	0.465184	2.66123**
Age	0.0186823	2.12171
Income	0.00002	0.576957
Education Level:		
Bachelor	0.671169	3.18245**
Master	0.563857	2.19309**
PhD	0.570759	1.46627
Medical doc.	30.3797	0.00002
Family house hold (age) :		
Child (<10 years)	-0.289725	-2.26608**
Adult (>10 years)	-0.239461	-3.55676**
Marital status	-0.161949	-0.729308
Macffaden R^2	0.0602	
Log likelihood function	-466.8066	
% of right prediction	0.8558	

Note: ** indicates significant at 5 percent level

CONCLUSIONS

By referring to the results, majority of respondents were from urban area and married. Generally most of the respondents were females, under 40 years- old and educated more than diploma level. This is consistent by the study have been done by Neoushouser *et. al.* (1999), significantly higher users of nutrition label are almost women and the consumers under 35 years and those with higher than diploma. The finding of the study reveals that income, education levels, residential area and gender are the most vital and significant factors that influence the nutrition label reading behaviour, thus, should be able to assist the government and food producers in taking into consideration the products market potential in near future. Moreover, it can be concluded from results; demographic factors can affect the consumers' behaviour during purchasing food products. Whether they read the label or not, understanding nutrition label and purchasing food products based on nutrition information are affected by their socio-economics factors.

The result of the regression analysis show that most of the variables in the equation have the expected prior sign, indicating the relationship between these variables (residential area, gender, income, education levels, family household) and the dependent variable –(1) reading nutrition label (2) influenced by source of information. The result indicate that gender, income, area and education levels increase the reading of nutrition labelling and for second dependent variable the results show that gender ,age and education levels increase the influenced by source of information. Hence based on a consequence and compare with the results from other methods, it can be concluded that economically and statistically, the results are accepted to be a model of analysis and calculation of perception towards nutrition labels.

Although the awareness of health conscious is increasing, but still for a large group of consumers is not easy to understand the information which, are provided by nutrition labels. As the matter of fact, Iranian government, and related institutions should fulfil the needs of consumers especially in the aspect food health management and consumers' health requirements. Improving the public awareness and developing the standard control measures to ensure correct labelling, which is intend on the producers, will increase purchasing based on nutrition labels.

REFERENCES

Altman,T.A. 2000. Nutrition information: United State. In *Food labeling*, ed R. Blanchfield, pp 147-165. Cambridge: Woodhead Publishing Limited

Berner, L. A. and J. A. O'Donnell. 1998. Functional Foods and Health Claims legislations: Applications to Dairy Foods. *International Dairy Journal* 8(5-6):355-362.

Cunningham, J., Trevisan, L and Milligan, G. 2004. Lessons learned from providing a free nutrition labelling tool for industry—the Australian experience. *Journal of Food Composition and Analysis* 17(3-4):565-574.

Golan, E. Economics of Food Labelling; Agricultural Economic Report No. (AER793) Washington, D.C, January 2001.

Hawkes, C. 2004. Nutrition labels and health claims: the global regulatory environment. WHO Library Cataloguing-in-Publication Data.

http://www.who.int/dietphysicalactivity/media/en/dpa_labelling_report.pdf Accessed in 21 May 2004

Insall, L. 2000. Nutrition information: European Union. In *Food labelling*, ed R. Blanchfield, pp 125-146. Cambridge: Woodhead Publishing Limited.

Iran Institute of Standard and Industrial Research of Iran (ISIRI), 2000. The standard report for Nutrition Labelling 19/25.

Kotler, P. Marketing Management. 11th ed. New Jersey: Pearson Education International 2003.

Kurtzweil, P. 1995. Answer to Consumer Questions about food label. *FDA Consumer* 29:6-11.

Levy A.S. and S. Fein. 1998. Consumer's ability to perform tasks using nutrition labels. *Journal of Nutrition Education* 30:210-217.

Lewis, J. and S. Jefferson. 2000. The use of dietary guidelines and recommended dietary intake in the development of food regulations. *Australian Journal of Nutrition and Dietetics* 57(3): 136-144.

Lin, C.J., Lee, J and Yen, S. 2004. Do dietary intakes affect search for nutrient information on food labels? *Journal of Social Science & Medicine*,59(9),1955-1967.

Nanally, Jum C. 1978. Psychometric Theory. New York : McGraw- Hill Book Company.

Neuhouser, M., Kristal, A and Patterson,R. 1999.   Use of Food Nutrition Labels is Associated with Lower Fat Intake. *Journal of the American Dietetic Association* 99(1):45-53.

 Rodolfo, M. and Jr. Nayga. 1999. toward an understanding of consumers' perceptions of food labels. *The International Food and Agribusiness Management Review* 2(1): 29-45.

United State Department of Agriculture (USDA), 1996. Repot on participation by food retailers in providing nutrition labelling/ safe handling instructions information, Report No:1996-98-005p.

Wails, A. 1996. Food labeling. *Nutridate* 7(3) 21-27.

Yuen, Caroline. Hong Kong Market Development Reports Nutrition Labeling Proposed in Hong Kong. USDA.2003. Report NO. #HK3009.

The Global Challenges of Management Influence Tactics Option for New Technology Adoption in Business Enterprises

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ABSTRACT

The current waves of globalisation challenges force organisations to adapt to technological change in order to sustain competitive advantage. New technology change may include significant changes in the tools, procedures and attitudes of the present employees. The key to combat this problem is the Technological Change Agent, who initiates and implements new technology; thereby overcoming any resistance from potential users. Using power-influence leadership theory, this study investigates the relationship between resistance and change agent's influence tactic in implementing the new technology. In general, the study confirms that there is no single best influence tactic for all situations. The effectiveness of a single tactic (soft, rational, or hard) is differently related to the resistance level (high or low). Specifically, the study finds that the change agents need to identify user's resistance level and to select the best-fit tactic for that particular user in that given situation. Importantly, the study shows that gender plays a significant role in the effectiveness of influence tactics. Men and women change agents use different tactics, depending on the user's gender. The study concludes that the selection of the best-fit influence tactic option depends on the gender of both the user and change agent, and the user's resistance level.

INTRODUCTION

Globalisation is the phenomenon of the increasing interdependency between markets; opening themselves to other markets, the objects of trade being capital and goods, including culture. To sustain competitive advantage, organizations need to be creative, innovative and adaptive to change. Technology, on the other hand, creates the competitive advantages and vast global opportunities for organizations (Laudon & Laudon, 2002). Globalization has made these technological changes even more rapid and unpredictable (Eisenhardt, 2002). In doing so, new technology and information systems are being introduced and initiated within the organization. There are ample evidences to demonstrate that a user's perceptions of a new information technology can have critical impact on the degree whether an implementation effort succeeds or fails (Abdinnour-Helm, Lengnick-Hall, & Lengnick-Hall, 2003). Maurer (Maurer, 1996, as cited in Gray, 2002) asserted that only one-third of major technological changes in organizations are successful; new technology failures are mainly caused by those who resisted change. Change is a constant element in the successful organisations. The effects are not limited to the environment alone but more importantly the human lives. Resistances to changes are due to fear of losing – security, pride and satisfaction, freedom, responsibility, authority and status. Management cannot assume that users willingly adopt or use the new technology without any form of resistance (Burton, Leitch, & Tuttle, 2001) - an illegitimate behavior and an attack on the organizational interests (Boonstra & Gravenhorst, 1998).

NEW TECHNOLOGY ADOPTION AND USER RESISTANCE

Breham (1966) defined resistance as 'an aversive motivational state, initiated when one perceives that ones' freedom is threatened, and directing thought and action toward regaining the threatened freedom'. Similar to attitude, resistance include three components: an affective component ("I don't like it!), a cognitive component ("I don't believe it!"), and a behavioural component ("I won't do it!") (Knowles, Butler, & Linn, 2001). People resists major changes in organizations because of lack of trust; belief that change is unnecessary; belief that the change is not feasible; economic threats; relative high cost; fear of personal failure; loss of status and power; threat to values and ideals; and resentment of interference (Yukl, 1994). To explore resistance to new technology, it is necessary to understand the concept of technology acceptance. The technology acceptance model (TAM) (Davis, 1985) considered two antecedents—perceived usefulness and perceived ease of using information technology. There is significant evidence (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Mathieson, 1991; Taylor & Todd, 1995; Benedetto, Calantone, & Chun Zhang, 2003; Liaw & Huang, 2003) to support the TAM; some in the Malaysian context (Dahlan, Ramayah, & Looi, 2003; Dahlan, Kalthum, Ellitan, & Dahlan, 2003; Ramayah, Dahlan, & Adni, 2003; Wong, 2003). Positive attitude to technology adoption led to increased technology use (Compeau and Higgins, 1991; Lucas, 1975; Robey, 1979; Liaw & Huang, 2003;

Ramayah, Noor, Nasurdin, & Lim, 2002; Ramayah & Jantan, 2003). Hence, it is crucial to shape the positive attitudes towards technology adoption in determining new technology information system implementation effectiveness. Herold, Farmer and Mobley (1995) suggested that pre-implementation attitude towards technology is the initial attitude that shapes future implementation phases. It is important to understand the nature and origins of such attitudes, and factors that affect them. Rather than mandating usage, management could implement more effective social influence strategies. Information system may produce desirable outcomes even when user attitudes are unfavourable; but, the system may produce even better outcomes when user attitudes are favourable (Abdinnour-Helm et al., 2003).

INFLUENCE TACTICS

To offset resistance, management should adopt influential power that focuses on the capacity of the 'agent' to influence the 'target' (Yukl, 1994). Kipnis, Schmidt, and Wilkinson (1980) described 'influence tactics' as behaviours of an agent to gain from the target, while Ansari (1990) suggested that behaviours based on available resources are important for successful influence tactics. It involves attempts by the agent to change the behaviour, attitudes, or beliefs of the target (Castro, Douglas, Hochwarter, Ferris, & Frink, 2003). Importantly, agents must be conscious of typical effects of the choice and understand the most logical and effective choice of tactics used (Anderson, 1998). Different uses of influence tactics are studied: effectiveness (Kipnis et al., 1980; Yukl, Guinan, & Sottolano, 1995); target's hierarchical position (Kipnis et al., 1980; Yukl & Tracey, 1992); direction of influence—upward, downward, or lateral (Yukl and Falbe, 1990); and the importance of individual and contextual determinants of tactics (Ansari & Kapoor, 1987; Yukl, Falbe, & Youn, 1993). Kipnis and Schmidt (1985) suggested that influence tactics are grouped into three types: hard, soft, and rational persuasion. Hard tactics demand authority and position power, and they tend to be impersonal and manipulative. Soft tactics include personal power and power sharing (Falbe & Yukl, 1992), while rational tactics entail reasoning and rational persuasion (Kipnis & Schmidt, 1985). Usage of rational and soft tactics is regarded as fair interpersonal treatment (Tepper, Eisenbach, Kirby, & Potter, 1998). In contrast, harder tactics are less friendly and less socially desirable than the softer varieties that allow some freedom for the target (Kippenberg & Steensma, 2003; Yukl & Tracey, 1992). For example, pressure is used mostly to change the behavior of a subordinate, and it is used to acquire personal benefit from a superior. Kipnis et al. (1980) found that pressure is used after encountering initial resistance; more administrative sanction and personal action are more likely to be used when there is non-compliance and resistance to requests. However, hard tactics such as demands, threats and control generally pursue poor performance (Gavix, Green, & Fairhurst, 1995) and are frequently used in change process, while rational persuasion and coalition tactics aim to attain support from peers and superiors for major policy change (Gravenhorst & Boonstra, 1998). Further, change agents are more likely to use demands and threats, but less likely to use reward when they are insulted by the targets (Carothers & Allen, 1999).

NEW TECHNOLOGY ADOPTION AND INFLUENCE TACTICS

Individuals often view organizational change as a threat, unless change agents are able to influence and change user's attitudes, roles and skills (Yukl, 1994). In the context of technology adoption, the 'technological change agent' (who initiates and implements the new technology) confronts varying level of resistance from potential users. There are very limited studies that demonstrate the relationship between influence tactics and user resistance to technology adoption. During the technological change process, change agents use different tactics in responding to resistance level and they need to enhance their abilities to 'read' or diagnose different situations and select suitable influence methods (Lee & Sweeney, 2001). It is therefore crucial for the change agent to understand the effectiveness of an influence tactic on the resistance level towards technology adoption. This is vital to the success, and even survival of the firm (Enns, Huff, & Golden, 2003). Change agents are frequently required to spend much of their time attempting to convince and influence others to commit to strategic technology projects (Lederer & Mendelow, 1988). During the influencing process, attention should not only be paid to 'how' the tactic is implemented but also to 'why' the tactic is used (Hughes, Ginnett, & Curphy, 2002). There could be several reasons for selecting one or more possible tactics that had led to successful outcome more frequently than others (Hughes et al., 2002). Yukl et al. (1995) suggested that managers vary their tactics depending on the goals of the influence attempt; to help the organizations instigate strategic technological change that is expected to provide significant organisational benefits.

GENDER AND INFLUENCE TACTICS

Research on target's gender and influence tactics seem inconclusive. Ansari (1989) found that ingratiation (soft tactic) is more likely to be used on male targets, who are more influenced by the agent's expertise (rational tactic) compared to female targets (Liew, 2003). Given the extensive role of technology in business and the

increasing presence of women in the professional domain, it is important to understand gender differences of change agents in effective use of influence tactics (Venkatesh, Morris, & Ackerman, 2000). Stahelski and Paynton (1995) and Kipnis et al. (1980) found no significant gender differences for any power base or influence tactic use in any condition. However, previous studies indicated that men and women use different influence tactics. Men tend to use masculine strategies (threats or rewards) to resolve conflicts (Dubrin, 1991), and masculine individuals are more willing to use threats to resolve conflicts (Carothers and Allen, 1999). Generally, men tend to react more strongly when insulted, and they switch from reward to coercion, while females continue to use request when insulted (Carothers & Allen, 1999). Further, male managers use more direct strategies (such as coercion) to influence subordinates (Hirokawa, Kodama, & Harper, 1990), and authoritarian men prefer to use assertiveness and bargaining (exchange) more frequently because they probably identify themselves with institutional authority (Rajan & Krishnan, 2002). In addition, Mai-Dalton and Sullivan (1981) suggested that leaders are more likely to use reward and exchange tactic for subordinates of their own sex rather than for the opposite sex. Interestingly, Liew (2003) found that if both the target and change agent are the same sex, there will be more instrumental dependency and personalized exchange tactics. In contrast, female change agents use rational reasoning and upward appeals more frequently than males (Lee & Sweeney, 2001) possibly because hard influence tactics (assertiveness and upward appeal) are less effective when employed by females (Castro et al., 2003) as they generally lack the expertise and legitimate power (Carli, 1999). Further, Falbo (1977) found that females are more likely to use emotional tactics (such as tears) to influence others.

RESULTS

So, do the change agents use the same particular influence tactics when dealing with different levels of user's resistance? Or, they vary the use of the influence tactics in different situations (high or low resistance)? What determines the final choice among various tactics? This paper presents an empirical study assessing six influence tactics in responding to various resistance levels, and examining the influential effectiveness on future technological implementations. Further, this paper highlights the impact of gender of the user, gender of the change agent, and the interaction among variables, on the use of influence tactics. A total of 800 questionnaires were distributed; of which, 283 sets were completed and usable.

We conducted 5-step hierarchical multiple regression for the data analysis. In step 1, tenure with the current change agent was entered and it acted as control variable as an individual's choice of influence tactics was dependent on the individual's relationship with the target (Falbo & Peplau, 1980). Secondly, the direct effect of resistance level was entered (step 2), and then followed by dummy variable for gender of user and change agent (step 3). Subsequently, a total of nine two-way interaction terms (interaction between resistance level and user's sex; interaction between resistance level and change agent's sex; and interaction between user's sex and change agent's sex) were entered. Lastly, four three-way interaction terms (interaction among resistance level, user's sex, and change agent's sex) were entered. The hierarchical multiple regression analysis was carried out for each dimension of influence tactics. Table 4 reports a summary of hierarchical regression analysis.

As shown in Table 1, the control variable of tenure with change agent did not significantly affect the use of influence tactics. The direct effect of predictor—user's level of resistance (step 2) accounted significantly for a total of 5%, 21%, 6%, 5%, 11%, and 9% the variance, respectively, in personalized exchange, expert help, rational persuasion, upward appeal, assertiveness, and reminding. The findings reveal that level of resistance regarding overall set up negatively related the use of personalized exchange, expert help, assertiveness, and reminding tactic. In addition, level of resistance regarding value negatively related the use of expert help, rational persuasion, upward appeal, assertiveness, and reminding tactic. But, level of resistance regarding timing positively related to the use of upward appeal, assertiveness, and reminding tactic.

For step 3, both direct effect of predictor—gender of the user and gender of the change agent were found to be insignificant in predicting the use of influence tactics. Of interest were significant 2-way interactions (step 4) between level of resistance and user's sex for personalized exchange tactic and expert help tactic. The first interaction [see Figure 1(a)] revealed that, at low level of resistance regarding value, female users would encourage their change agent to use more of personalized exchange tactic. However, when the level of resistance of the female users increased, the use of personalized exchange by their change agent decreased.

Table 1 : Summary of Hierarchical Regression Analysis

		Model					
		1	2	3	4	5	6
Step	Variables entered	Beta	Beta	Beta	Beta	Beta	Beta
1	Control						
	R^2 change	.00	.01	.00	.00	.00	.00
	Tenure with change agents	-.03	.12	-.06	.04	-.02	.01
2	Direct Effects						
	R^2 change	.05**	.21**	.06**	.05**	.11**	.09**
	Resistance regarding overall set up (R1)	-.19*	-.34**	-.03	-.07	-.17*	-.17*
	Resistance regarding value (R2)	.04	-.15*	-.22**	-.22**	-.25**	-.22**
	Resistance regarding timing (R3)	-.11	.05	.01	.15*	.11	.18**
	Resistance regarding capability (R4)	.07	-.10	-.03	.05	-.01	-.03
3	Direct Effects						
	R^2 change	.00	.01	.01	.00	.01	.00
	User's sex (US) [R]	-.01	.07	.07	.03	.07	.02
	Change agent's sex (AS) [R]	.03	-.10	.08	.05	-.06	.02
4	2-way interaction						
	R^2 change	.06*	.07**	.02	.04	.04	.03
	R1 X US	.26	.05	-.06	-.12	-.26	-.32
	R2 X US	.54*	.29	.06	.59*	.25	-.08
	R3 X US	-.42	-.45	.00	-.11	-.30	-.16
	R4 X US	-.13	-.42*	-.05	-.19	.05	-.02
	R1 X AS	-.22	-.73**	-.31	-.64*	-.34	.14
	R2 X AS	.19	.50*	.49	.14	-.01	.29
	R3 X AS	-.25	.49*	.28	.50	.47	-.22
	R4 X AS	-.39	-.27	-.17	-.05	-.44*	-.27
	US X AS	.31*	.17	-.05	.12	-.05	.07
5	3-way Interaction						
	R^2 change	.03	.03*	.05**	.06**	.04*	.07**
	R1 X US X AS	.87	.50	.18	1.02	-.03	.60
	R2 X US X AS	-1.26*	-1.49**	-1.74**	-1.52**	-1.54**	-1.96**
	R3 X US X AS	-.09	-.13	-.31	-1.12*	.03	-1.01
	R4 X US X AS	.62	.66	.99*	.51	.41	.71

Note. * $p < .05$, ** $p < .01$; [R] Dummy Coded (0 = Female, 1 = Male); Model 1= Personalized Exchange; Model 2 = Expert Help; Model 3 = Rational Persuasion; Model 4 = Upward Appeal; Model 5 = Assertiveness; Model 6 = Reminding

Besides, personalized exchange was more likely to be used to the male users in responding to their high level of resistance regarding value, as compared to female user. On the other hand, Figure 1(b) indicated that at low level of resistance regarding capability, male users were influenced more with expert help, as compared to female users. The higher their level of resistance, the lower would be the use of expert help by their change agent. Female users were influenced at the same extent of expert help tactics regardless their level of resistance regarding capability.
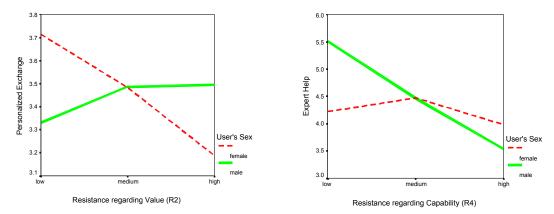
Figure 1: Interactions between level of resistance and user's sex on influence tactics.

In the case of interaction between level of resistance and change agent's sex, Figure 2(a) indicated that the tendency to use expert help tactics by both male and female change agent was decreased as the level of resistance increased. At high level of resistance regarding overall set up, female change agents displayed higher extent in using expert help tactic as compared to male change agents. On the other hand, for the high level of resistance regarding timing, male and female change agents did not differ significantly in terms of the use of expert help tactics. But male change agent reported significantly more frequent use of expert help tactics than male change agent when the resistance level is low [see Figure 2(b)]. In analysing the interaction between user's sex and change agent's sex, Figure 3 illustrated that if both user and change agent were of same sex, the higher the use of personalized exchange was observed.

Besides that, three-way interactions among the predictors can be seen from the graphical presentation at different levels of resistance on expert help, rational persuasion, upward appeal, assertiveness, and reminding as shown in Figures 4 – 8. The first interaction [see Figure 4(a)] illustrated that, male change agents, as compared to female change agents, made more frequent use of expert help with female users at high level of resistance regarding value. To the contrary, female change agent reported significantly higher on expert help than the male change when responding to male users at high level of resistance. On the other hand, when dealing with both female and male users at low level of resistance regarding value [see Figure 4(b)], female change agents made more frequent use of expert help than male change agents.
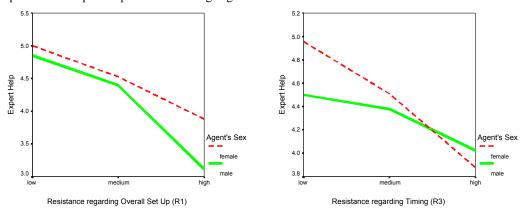
Figure 2: Interactions between Level of Resistance and Change Agent's Sex on Influence Tactics.
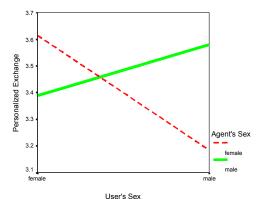
Figure 3: Interactions between User's Sex and Change Agent's Sex on Influence Tactics.
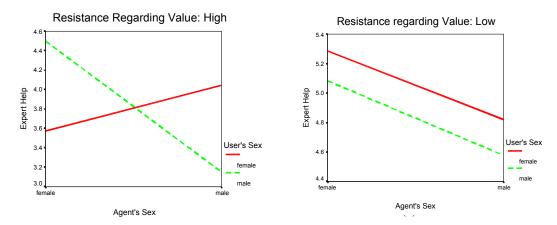
Figure 4: Interaction among Resistance regarding Value, User's sex, and Change Agent's Sex on Expert Help.

The second interaction [see Figure 5(a)] revealed that, when resistance regarding value is high, male and female change agents did not differ significantly in terms of their use of rational persuasion tactic with their male users. However, when confronted with female users at high resistance, male change agents become distinctly higher in using rational persuasion tactic as compared to female change agents. On the other hand, at low level of resistance regarding value [see Figure 5(b)], male change agents, as compared to female change agents, showed greater tendency in using rational persuasion tactic with their male users; to the contrary, they showed lesser tendency with their female users as compared to female change agents. At high level of resistance regarding value [see Figure 6(a)], both male and female change agents reported same extent in term of their use of upward appeal with male users. However, male change agents, as compared to female change agents, made significantly higher use of upward appeal tactic with their female users. At low level of resistance regarding value [see Figure 6(b)], male (female) change agents, as compared to female (male) change agents, showed greater tendency in using upward appeal tactic with their male (female) users.

Figure 7(a) indicated that, at high level of resistance regarding value, gender of the change agents did not differ significantly in their use of assertiveness tactic with female users. Both showed lesser tendency to use assertiveness with their female users. However, in influencing male user, female change agents exerted more assertiveness, as compared to male change agents. When resistance regarding value is low [see Figure 7(b)], both male and female change agents showed same extent and greater tendency to use assertiveness tactic with their female users. However, male change agents, as compared to female change agents, made frequent use of assertiveness tactic with their male users at low level of resistance regarding value. Figure 8(a) revealed that, at high level of resistance regarding value, change agents showed greater tendency to use reminding tactic with users of the opposite sex. However, when resistance regarding value is low [see Figure 8(b)], both male and female change agents did not differ in terms their use of reminding with their male user. However, male users at low level of resistance were significantly higher influenced with reminding, as compared to female users.
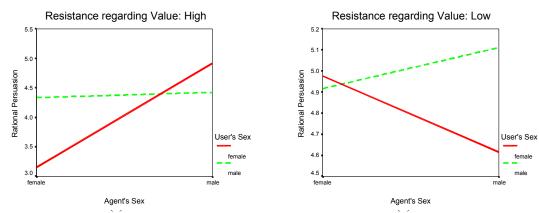
Figure 5: Interaction among Resistance regarding Value, User's Sex, and Change Agent's Sex on Rational Persuasion.
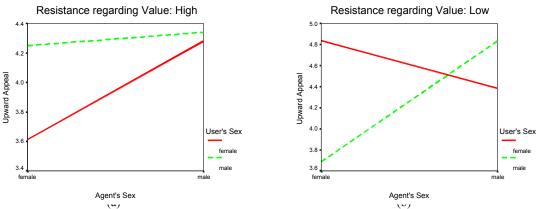
Figure 6: Interaction among Resistance regarding Value, User's Sex, and Change Agent's Sex on Upward Appeal.
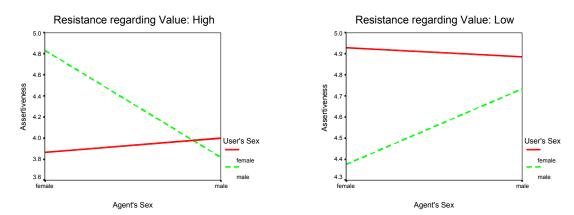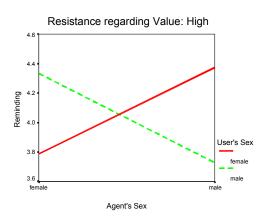
Figure 7: Interaction among Resistance regarding Value, User's Sex, and Change Agent's Sex on Assertiveness.
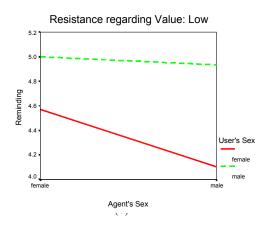
Figure 8: Interaction among Resistance regarding Value, User's Sex, and Change Agent's Sex on Reminding.

DISCUSSION AND CONCLUSION

Change agents play a critical role in implementing new technology or information in an organization. In order to gain the compliance from users, they spend time to convince and influence others to commit to strategic technology initiatives (Lederer & Mendelow, 1988). Therefore, a throughout understanding of the effective use of influence tactics is important for change agents' right choice during their influencing process.

In this study, personalized exchange comprised of items from soft tactics, (e.g., exchange, personalized help, and instrumental dependency), which is the least used influence tactics among the six tactics by change agents in Malaysia (M=3.48; SD=1.08). To the contrary, rational persuasion is the most used tactic by change agents to influence users (M=4.54, SD=1.08). Findings are consistency with previous study, which claimed that change agents with greater technical background used rational persuasion almost exclusively and it is believed that change agents, especially for those work as the internal IT specialists, who often possess technical backgrounds may be reluctant to engage in soft influence tactics (Enns et al., 2003).

This study articulates a framework to understand the relationship among user's level of resistance, gender differences, and the effective use of influence tactic by change agents. Therefore, it would add to the limited literature in understanding the antecedents of the use of influence tactic. On the other hand, this study also has some practical implications for change agents. It explores the simple dispositional relationship between user's level of resistance and influence tactics. There is no single best influence tactics for all situations. Change agents should not employ one particular tactic to all users, on the contrary, they have to diagnose various users' level of resistance and select the best-fit tactic to convince their users during the implementation of the new technology.

Additionally, the present study classified the user's level of resistance into four dimensions, and it was found that appropriateness of a single tactic is differently related to various dimension of resistance level. For example, hard tactic (e.g., upward appeal and reminding) is effective to be used when confronting with user's high level of resistance regarding timing, to the contrast, it was less effective at high level of resistance regarding overall set up and value.

While men may still represent a majority of the workforce, particularly in technology-oriented areas, the number of women in these areas and all levels of the organizational hierarchy continue to rise (Venkatesh et al., 2000). The present study brings findings to the forefront by showing the impact of gender differences on the effective use of influence tactics. A more substantive implication of this study is its exploration of the interactive effect of gender differences and level of resistance. Besides that, the study examined both gender of the user and the change agent as the interactive predictor of the change agents' use of influence tactics. Soft tactics is effective to be used by the change agents with users of their own sex. Overall, the findings of the study indicate that the use of influence tactics is affected by gender difference and level of resistance. Therefore, change agents should take into account of gender differences (i.e., user's sex and change agent's sex) during their influencing process with users who possess different level of resistance.

Results of the study suggest that in responding to high level of resistance, female change agents, as compared to male change agents, showed a distinctive tendency to use expert help, assertiveness, and reminding to their male

users. To the contrary, male change agents significantly reported the higher use of rational persuasion, upward appeal, and reminding to their female users at high level of resistance.

Strength of this study is by using users' assessments of the actual effective use of change agent's influence tactics instead of their perceived exercise of influence tactics that is prefer by the target. Adhere to Carli (1999) suggestions, evidence for gender differences in influence strategy is ideally included observations of actual behavior. Besides that, it lessened the risk of the change agent's self-report bias in the data.

There are numbers of limitations in this study. Due to the time constraint, the samples were collected from individual (users) located in Penang. Findings based on self-reports are somewhat limited in respondents' utility because they may not report their behavior accurately (Carli, 1999). Therefore, it is more profitable if the data were collected in dyadic evaluation, that is, survey regarding user's level of resistance to be reported by change agent, whilst survey regarding change's agents actual use of influence tactics to be evaluated by users.

With the growing presence of women in the workforce at all levels, the study suggests that the use of influence tactics is affected by gender differences. The gender of the users and change agents found to have little independent effect on the use of influence tactics. However, gender interactive effects with level of resistance appear to change the use of influence tactic by change agents. Therefore, future researchers should treat gender of users and change agents as the moderator variable.

As a conclusion, this research suggests that, change agents differ their use of influence tactics according to resistance level of the user. Findings reveal that change agents adopt different influence tactics in responding to the user's level of resistance. Besides that, men and women change agents differ in the use of influence tactics. Additionally, they vary their use of influence tactic according to the gender differences of the user. As a result, change agents must understand the factor of user's resistance level and gender differences that are likely to lead to their effective use of influence tactics. In the end, change agents who are responsible for the strategic technology initiatives must improve their skills to read and diagnose user's different level of resistance in order to select the best-fit tactic during their influencing process.

REFERENCES

Abdinnour-Helm, S., Lengnick-Hall, M., & Lengnick-Hall, C. (2003). Pre-implementation attitudes and organizational readiness for implementing an Enterprise Resource Planning system. *European Journal of Operational Research, 146,* 258-273.

Anderson, D. A. (1998). Using power and influence tactics for better results. *Marine Corps Gazette, 82,* 37-38.

Ansari, M. A. (1989). Effects of leader sex, subordinate sex, and subordinate performance on the use of influence strategies. *Sex Roles, 5,* 286-293.

Ansari, M. A. (1990). *Managing people at work: Leadership styles and influence strategies.* Newbury Park, CA: Sage.

Ansari, M.A., & Kapoor, A. (1987). Organizational context and upward influence tactics. *Organizational Behavioural and Human Decision Processes, 40,* 39-49.

Barnett, R. C., & Marshall, N. L. (1991). The relationship between women's work and family roles and their subjective well-being and psychological distress. In Women and Health: Stress and Opportunity, M. Frankenhaeuser, V. Lundberg, and M.A. Chesney (Eds.), New York: Plenum.

Bem, S. L. (1981). The BSRI and gender schema theory: A reply to Spence and Helmreich. *Psychological Review, 88,* 369-371.

Benedetto, C. A. D., Calantone, R. J., & Chun Zhang (2003). International technology transfer. *International Marketing Review, 20,* 446-462.

Bhal, K.T., & Ansari, M. A. (2000). *Managing dyadic interactions in organizational leadership.* Thousand Oaks, CA: Sage.

Brehm, J. W. (1966). *A Theory of psychological reactance.* San Diego, CA: Academic.

Burton, F. G., Leitch, R. A., & Tuttle, B.M. (2001). A user's willingness to adopt a new information system: The influence of the decision-making improvements and performance-monitoring dimension of the system. *Journal of Information System, 15,* 61-79.

Carli, L. L. (1999). Gender, interpersonal power, and social influence. *Journal of Social Issue, 55,* 81-99.

Carothers, B. J., & Allen, J. B. (1999). Relationship of employment status, gender role, *insult, and gender with use of influence tactics. Sex Roles, 41, 375-387.*

Castro, S. L., Douglas, C., Hochwarter, W. A., Ferris, G. R., & Frink, D. D. (2003). The effects of positive affect and gender on the influence tactics – job performance relationship. *Journal of Leadership and Organizational Studies, 10,* 1.

Compeau, D. R. & Higgins, C. A. (1991, December). *A social cognitive theory perspective on individual reactions to computing technology.* Proceedings of the Twelfth International Conference on Information Systems, New York.

Davis, F. D. (1985). *A technology acceptance model for empirically testing new end-user systems: Theory and results.* Unpublished Doctoral dissertation, Massachusetts Institute of Technology, Boston, Massachusetts.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Querterly, 13,* 319-339.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35,* 892-1003.

DuBrin, A. J. (1991). Sex and gender differences in tactics of influence. *Psychological Reports, 68,* 635-646.

Enns, H. G., Huff, S. L., & Golden, B. R. (2003). CIO influence behaviors: the impact of technical background. *Information and Management, 40,* 467-485.

Falbe, C. & Yukl, G. (1992). Consequences for managers of using single influence tactics and combinations of tactics. *Academy of Management Journal, 35,* 638-652.

Falbo, T. (1977). Multidimensional scaling of power strategies. *Journal of Personality and Social Psychology, 35,* 537-547.

Falbo, T., & Peplau, L. A. (1980). Power tactics in intimate relationships. *Journal of Personality and Social Psychology, 38,* 618-628.

Gavix, M. B., Green, S. G., & Fairhurst, G. T. (1995). Managerial control strategies for poor performance over time and the impact on subordinate reactions. *Organizational Behavior and Human Decision Processes, 63,* 207-221.

Gravenhorst, K. M. B., & Boonstra, J. J. (1998). The use of influence tactics in constructive change processes. *European Journal of Work and Organizational Psychology, 7,* 179-196.

Gray, C. (2002). Entrepreneurship, resistance to chance and growth in small firms. *Journal of Small Business and Enterprise Development, 9,* 61-72.

Herold, D. M., Farmer, S. M., & Mobley, M. I. (1995). Pre-implementation attitudes toward the introduction of robots in a unionized environment. *Journal of Engineering and Technology Management, 12,* 155-173.

Hirokawa, R. Y., Kodama, R. A., & Harper, N. L. (1990). Impact of managerial power on persuasive strategy selection by female and male managers. *Management Communication Quarterly, 34,* 250-265.

Hughes, R. L., Ginnett, R. C., & Curphy, G. J. (2002) *Leadership: Enhancing the lessons of experience.* New York: McGraw-Hill.

Kipnis, D. (1976). *The power holders.* Chicago, IL: University of Chicago Press.

Kipnis, D., & Schmidt, S. (1985). The language of persuasion. *Psychology Today, 4,* 40-46.

Kipnis, D., Schmidt, S., & Wilkinson, I. (1980). Intraorganizational influence tactics: Explorations in getting one's way. *Journal of Applied Psychology, 65,* 440-452.

Knippenberg, B. V., & Steensma, H. (2003). Future interaction expectation and the use of soft and hard influence tactics. *Applied Psychology: An International Review, 52,* 55-67.

Knowles, E. S., Butler, S., & Linn, J. A. (2001). Increasing compliance by reducing resistance. *The Sydney Symposium of Social Psychology, 3,* 41-60.

Kossek, E. E. (1989). The acceptance of human resource innovation by multiple constituencies. *Personnel Psychology, 42,* 263-281.

Kossek, E. E., Young, W., Gash, D. C., & Nichol, V. (1994). Waiting for innovation in human resource department: Godot implements a human resource information system. *Human Resource Management, 33,* 135-159.

Lederer, A. L., & Mendelow, A. L. (1988). Convincing top mangement of the strategic potential of information system. *MIS Quarterly, 12,* 525-534.

Lee, D. R., & Sweeney, P. J. (2001). An assessment of influence tactics used by project managers. *Engineering Management Journal, 13,* 16-24.

Liaw, S. S., & Huang, H. M. (2003). An investigation of user attitudes toward search engines as an information retrieval tool. *Computer in Human Behavior, 19,* 751-765.

Liew, L. L. (2003). *Downward influence tactics: The impact of leader-member exchange, affectivity, and gender.* Unpublished doctoral dissertation. Penang: University Science Malaysia.

Lucas, H. C. (1975). Performance and the use of an information system. *Management Science, 21,* 908-919.

Mai-Dalton, R. R., & Sullivan, J. J. (1981). The effect of manager's sex on the assignment to a challenging or a dull task and reasons for the choice. *Academy of Management Journal, 24,* 603-612.

Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information System Research, 2,* 173-191.

Minton, H. L., & Schneider, F. W. (1980). *Differential psychology.* Prospect Heights, IL: Waveland Press.

Rajan, S., & Krishnan, V. R. (2002). Impact of gender on influence, power and authoritarianism. *Women in Management Review, 17,* 197-206.

Ramayah, T., & Jantan, M. (2003). *Attitude and intention to use web-based supply chain management (SCM) among SME's: Moderating effect of self efficacy.* Proceedings of the the Third International Conference on Electronic Commerce Engineering (IceCE2003), Hangzhou, China.

Ramayah, T., Noor, N., Nasurdin, A. M., & Lim, H. C. (2002). Cardholders attitude and bank credit card usage in Malaysia: An exploratory study. *Asian Academy of Management Journal, 7,* 72-102.

Robey, D. (1979). User attitudes and management information system use. *Academy of Management Journal, 22,* 527-538.

Stahelski, A. J., & Paynton, C. F. (1995). The effects of status cues on choices of social power and influence strategies. *Journal of Social Psychology, 135,* 553-560.

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information System Reseach, 6,* 144-176.

Tepper, B. J., Eisenbach, R. J., Kirby, S. L., & Potter, P. W. (1998). Test of a justice-based of subordinates' resistance to downward influence attempts. *Group & Organization Management, 23,* 144-160.

Vecchio, R. P. (2002). Leadership and gender advantage. *Leadership Quarterly, 13,* 643-671.

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly, 24,* 115-139.

Venkatesh, V., Morris, M. G., & Ackerman, P. L. (2000). A longitudinal field investigation of gender differences in individual technology adoption decision-making processes. *Organizational Behavior and Human Decision Processes, 83,* 33-60.

Yukl, G., & Falbe, C. M. (1990). Influence tactics and objectives in upward, downward, and lateral influence attempts. *Journal of Applied Psychology, 75,* 132–140.

Yukl, G., & Tracey, J. B. (1992). Consequences of influence tactics used with subordinates, peers, and the boss. *Journal of Applied Psychology, 77,* 525-535.

Yukl, G., Falbe, C. M., & Youn, J. Y. (1993). Patterns of influence behaviour for managers. *Group and Organizational Management, 18,* 5-28.

Yukl, G., Guinan, P. J., & Sottolano, D. (1995). Influence tactics used for different objectives with subordinates, peers, and supervisors. *Group and Organization Management, 3,* 272.

Yukl. G. (1994). *Leadership in organizations.* Englewood Cliff, NJ: Prentice-Hall.

An Analysis of the Strategic Planning Process:
Traditional Approaches and New Perspectives

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ABSTRACT

Strategic planning and analysis tools have been the subject of much scholastic debate over the last 20 years. A strategy is the vital foundation that holds a business together. Strategies give direction to the organization, determine its structure, the activities engaged, resources deployed and ultimately, its organizational performance. Given the importance and complexity of this activity, one would expect to find a literature in which there is a general agreement as to its significant characteristics and dimensions. Such is not the case. Thus, this paper aims to provide an overview of major work that has been carried out in this area and also highlight the divergence between the numerous schools of thoughts. The assimilation of these perspectives and viewpoints should enhance the reader's understanding of what strategic planning is and is not, thereby contributing to higher levels of awareness on why one approach is inadequate for the task of managing an organization in today's complex business environment.

INTRODUCTION

Although application of the concept of strategy has been part of management literature since the 1950s, there are still vastly conflicting views regarding its role and also, appropriate approach. Among the most important work in the early development of the field of strategic management are Chandler's (1962) Strategy and Structure, and Ansoff's (1965) Corporate Strategy. These early works centered on the use of objective and highly systematic procedures in strategic planning process, where strategists identify, evaluate, choose and carry out effective strategic options based on logic and extensive knowledge of important factors.

Recent developments in strategic planning literature have seen an increasing number of approaches that have given rise to conflicting views on the subject. For example, in *Strategy Safari,* Minzberg, Ahlstrand and Lampel (1998) list a total of 10 ways in which strategy is developed, while Whittington in his book *What is Strategy and Does it Matter?* (Whittington, 1993) categorizes strategic planning under four primary approaches, namely:

Classical approach
The classical approach views people and organizations as rational economic actors, assumed to respond in ways designed to optimize economic rewards. It emphasizes top-down management and profit maximization as the unifying goal in its strategic planning. Among the early proponents of this approach are Alfred Chandler (1962), Igor Ansoff (1965), and Alfred Sloan (1962). This strategy was historically derived from two type of models; the military concept of hierarchical command where a leader is regarded as the decision maker of all strategies, and the economic theory of rational optimization where profit maximization is considered as the ultimate goal of an organization.

Evolutionary approach
This 'survival of the fittest' principle is taken from the premise that the market forces determine the winners and losers in the business environment. Thus, evolutionists are against trying to outguess the market by investing heavily in a single major plan, but rather to only concentrate on short-term plans and fitting in with the market. With its emphasis on organizations to maintain high efficiency, evolutionary theory is regarded as a subset of a wider class of theories, variously described as 'capabilities', 'resource-based' or 'competence-based'. The central idea of competencies provides the basis for evolutionary and non-equilibrium theories of industrial competition and development. Among the early proponents of this theories are Adam Smith and Karl Marx; while the twentieth-century advocates include Chandler (1990), Hamel and Prahalad (1994), Pettigrew and Whip (1991).

The processual approach

This approach differ from both classical and evolution in the sense that strategy is viewed as more of a "muddling through" of small incremental steps. This involved repeated adjustments and compromise between the different stakeholders of the organization. The concept of the rational economic man making all the appropriate strategies (as advocated by the classics) and evolutionists' view of the market as the perfect force are deemed erroneous by these theorists. As put forward by Cyert and March (1963), people do not carry out unlimited search for information when doing strategic planning. They are often biased in their interpretation of data and accept the first satisfactory option that come to hand rather than finding the best one. Furthermore, because an organization is made up of different coalitions of individuals, strategic planning involved a lot of political and social skills to modify and gather support for strategies.

Systemic approach

Systemic theorists believe that in order to be successful a strategy must adapt and take into accord the social systems that the organization is operating in. Different value and assumptions regarding the environment will lead to managers taking into account different range of issues when considering strategies. This aspect is especially important when operating in an environment that places high importance on familial, national value and work structure (Ali, 1993, Al-Jafary & Hollingsworth, 1983; Chow, 1992; Dunbar & Katcher, 1990; Fukuyama, 1995; Gilley, 2000, Mintzberg, 1994, Selmer and de Leon, 1993).

As can be seen from the above, there are at least four major categorizations of strategic planning, as schools of thought. However, there are also similarities in certain aspects of the approaches/theories that make the differences not as huge as individual labels may presume. To a large extent, the argument about strategic planning methods lies between two broad approaches: the 'planning' school that regard strategic planning as a systematic, clear and articulated process; and the 'emergent/learning' school that views planning as an adaptive process arising from the organization's experience, culture and ever-changing environment. However, even these differences can be viewed as complementing each other when specifics are looked at. This can be seen from the growing body of empirical literatures that regards these categorizations of strategic planning as 'academic overkill' and suggests that in a complex business environment, both the planning and adaptive mode have a complementary rather than opposing role in ensuring effective decision-making. One such view comes from De Wit and Meyer (1999) who acknowledged that there is no one best way to formulate strategy, but rather, strategists need to integrate ideas from different thinkers to shape a unique synthesis that is tailored to their specific circumstances. This line of thought is echoed by Raymond Suutari (1999), who noted that in virtually every circumstance, the strategic decisions should be based on the combination of both the planned processes that examine the firm's position systematically; and also the "adaptive mode" process that reconciles the planned action with organizational capabilities, constraints and culture.

STRATEGY MODELS
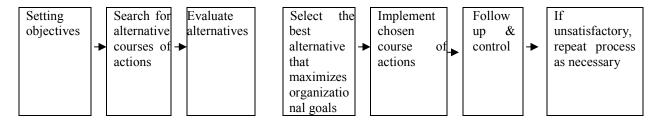
Although there is no single best way to organize a firm or formulate a strategy, there are always some approaches that are more effective than others. As put forward by Hoy and Miskel (1991), the "best approach" is one that fits the circumstances. So it is not surprising to see the different types of planning formulation/decision-making models, in line with the changing dynamic of the business environment. For instance, Tarter and Hoy (1998), based on his study on a contingency theory of decision-making, use a series of seven criteria to compare the similarities and differences among the six contemporary decision-making models:

Table 1: Comparison of Decision-Making Models

Models \ Criteria	Classical	Administrative	Mixed Scanning	Incremental	Garbage Can	Political
Setting Goals	Organizational objectives are set prior to alternatives	Objectives usually are set prior to alternatives	Policy guidelines are set prior to alternatives	Objectives & alternatives are intertwined	Objectives emerge spontaneously	Objectives emerge spontaneously
Means-end analysis	Always begins with a means-ends analysis	Frequently begins with a means-ends analysis, but occasionally ends change	Broad ends & tentative means focus the analysis	No means-ends analysis. Means & ends are not separable	Means & ends are independent; chance connects them	Personal ends determine organizational means
Test of a good decision	The best means to an organizational end	A satisfactory organizational outcome	A satisfactory organizational outcome	Decision makers agree that the decisions are in the right direction	Participants agree that the solution & problem match	Personal objectives are accomplished
Guiding principles	Theory	Theory & experience	Theory, experience & comparison	Experience & comparison	Chance	Power
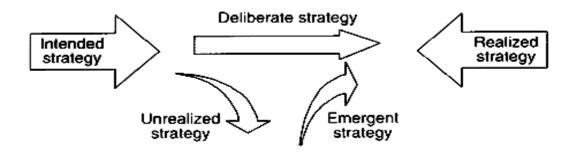
Sources: Tarter, C John; Hoy, Wayne K, Toward a contingency theory of decision making, Journal of Educational Administration; Volume 36 No. 3; 1998.

The strategic planning approach has been reflected in large part of the literature as a rather centralized process. The rational decision making model conceives strategic planning processes as logical activities that allow management to analytically determine an appropriate strategic path for their organization. This model which is also known as the "design school" or "fit school" relies on the premise that the goal of a strategy is to find a match between organization capabilities and opportunities within the competitive environment. This model is advocated by numerous authors such as Harrison and Pelletier, 1998, Johnson and Scholes, 2000, Ohmae, 1983; Wheelen and Hunger, 2004, David, 2003, Andersen, 2000).

| Setting objectives | → | Search for alternative courses of actions | → | Evaluate alternatives | | Select the best alternative that maximizes organizational goals | → | Implement chosen course of actions | → | Follow up & control | → | If unsatisfactory, repeat process as necessary |

Mintzberg was one of the first to highlight the fact that the result of an organization's strategy is not always the intended one, and the extent that an intended strategy can be realized is dependent on the strategic processes that exist within that organization. This is illustrated in the figure below:

Figure 1: Intended vs. Realized Strategy

In the concept of strategic 'stretch', strategic planning is seen not only as trying to ensure that resources are available, but also use to identify existing resources and competences that might be a basis for creating new opportunities (Harding, 1994). Strategies are normally formulated to cover three levels in an organization; corporate level, business level and operational level strategies.

Within these strategies' levels, management needs to determine the right mix of control and cooperation mechanism to ensure synergy. This is done by making sure that there is a right balance between the need for responsiveness in meeting environmental changes, and the need for synergy among the business units. This paradox of responsiveness and synergy leads to differing opinion on how to achieve these objectives; with debates going on between two main opposite views - the *portfolio* versus the *core competence* perspective. The differences between these two perspectives could be seen in the table below, taken from the book by De Wit and Meyer, the *Strategy Synthesis: Resolving Strategy Paradoxes To Create Competitive Advantage* (1999):

Table 2: Portfolio Versus Core Competence Perspective

	Portfolio Perspective	Core Competence Perspective
Emphasis on	Responsiveness over synergy	Synergy over responsiveness
View of competition	Firms compete within a business	Corporations compete across businesses
Competitive strategy at	Business level	Corporate level
Key success factor	Responsiveness to business demands	Competence leveraging
Corporate composition	Potentially unrelated (diverse)	Shared competence-based (focused)
Multibusiness synergy	Cash flow optimization	Rapid competence building
Primary task corporate center	Capital allocation to SBUs	Competence development & application
Position of business units	Highly autonomous (independent)	Highly integrated (interdependent)
Coordination between SBUs	Low, incidental	High, structural
Corporate control style	Setting financial objectives	Joint strategy development
Diversification acquisitions	Simple to accommodate	Difficult to integrate

Proponent of the core competence perspective such as C.K Prahalad and Gary Hamel (1994) use the Japanese business environment as an example to illustrate how tight coordination and cooperation mechanisms are the best way to cash in on market opportunities. According to them, the real source of advantage is in management's ability to consolidate corporate-wide technologies and skills into competencies, so that individual businesses can pursue a wider domain of innovation rather than pursuing 'bounded' innovation opportunities - such as marginal product-line extensions or geographic expansions. On the other hand, proponents of the portfolio perspective view core

competence approach as not only leading to loss of responsiveness, but ultimately lack of accountability and 'fuzzy' cooperation. This is borne out by many authors (such as Henderson 1979; Anslinger and Copeland, 1996), who pointed out that each business has its own unique characteristics and demand, and high responsiveness to the dynamic business environment could only be achieved through autonomous business.

STRATEGIC ANALYSIS TOOLS

In the 1960s, long-range planning was mostly concentrated on functional aspects within the firm, making sure of effective alignment of each function – marketing, production, finance, and human resources to achieve organizational goals. Although this planning process was appropriate for the relatively slow-paced environment of that era, the emerging high-growth business environment in the 1970s and 1980s made it essential for managers to seek new methods of strategizing. The current environment of dynamic interaction and fast changes make external as well as internal focus equally important, with the major focus in strategizing turning increasingly towards both customers and competitors.

Changes in the form of strategic analysis tools have been documented by numerous researchers in the fields. Among the more important tools identified during the past several years are:

SWOT Analysis (1960s):
Analysis at the firm level of strengths, weaknesses, opportunities and threats. This framework can help firms to search for their distinctive competences and assess their competitive positioning through organization-environment fit, that is, matching a firm's strengths and weaknesses to its opportunities and threats. Among the researchers that have been involved in this area are Ansoff, 1965; Andrew, 1971; and Hofer and Schendel, 1978.

BCG Growth-Share Matrix (1970s):
This framework was developed by the Boston Consulting Group, and is mainly concerned with the pattern of the firms' investments in different products. Classification of activities was based on two indices; the industry's rate of growth, and the relative market share of the firm in question. The assumption is that, if the firm is operating in a high growth industry, then it is easier for the firm to expand its activities by increasing its relative market shares, and secondly, the higher a firm's relative market share, the stronger its competitive position is assumed to be.

Another portfolio analysis that used a two-dimensional grid (in this case, market growth and relative market share) to classify the different businesses is the GE Matrix. This framework was developed by General Electric and McKinsey.

Profit Impact of Market Strategy Analysis (1970s and Early 1980s):
The PIMS approach was developed at Harvard Business School and is another type of portfolio analysis framework. Its aim is to study factors that influence profitability in a business and the degree of influence that each of these factors has. It was established to address certain limitations of BCG and GE models, i.e., more in-depth analysis of other factors that relate to profitability and ROI, and not just concentrating on market share/relative market share. This portfolio analysis model investigates additional factors such as investment intensity, value added per employee, capacity utilization, vertical integration, industry concentration, etc.

Industry Analysis – Five Forces (early 80s):
Industry analysis was introduced by Michael Porter as a means of identifying the forces that shape the nature of the competitive environment. Five factors were cited as the determinants of competitive intensity in an industry, namely; barriers to entry, barriers to substitutes, rivalry intensity, bargaining power of suppliers and buyers. The framework works on the premise that firms operating within an industry possess identical resource bases and pursue similar strategies. Although it was quite a popular concept when first introduced, over the years it has been heavily criticized, among other things, for being descriptive, rather than prescriptive – providing little guide to what firms should actually do, or avoid doing. As put by critics, every firm would like to be in an industry with high barriers to entry, weak rivals and high profits, but few are so lucky.

Value Chain Analysis (mid 80s):
Porter (1985) recommend value chain as a means to identify and study those business activities that could transform inputs into rent-generating potential. According to him, "Difference among competitor's value chains are a key source of competitive advantage." Corporate value chain analysis involves examining:
- Each product line's value chain in terms of the various activities involved in producing that product or service

- The 'linkages' within each product line's value chain. Linkages are the connections between the way one value activity (e.g., production) is performed and the cost of performance of another activity (e.g., QC).
- The potential synergies among the value chains of different product lines or strategic business units.

Scenario Analysis (1970s, 1980s):
It is used by decision-makers in business, industry and government as a technique for analyzing a set of possibilities and exploring these combinations so as to improve current decisions. According to Fahey and Randall (1988), the purpose of scenario building is to:
- Enhance understanding of how the future might look, including the reasons why each particular view of a possible future might come about,
- Encourage diverse and new decisions by bringing into consideration fresh approaches in the planning process,
- Identify contingent decisions by investigating what an organization might do if certain circumstances arise.

They also categorize the scenarios into three dimensions, namely:
- Global scenarios: several distinctive future environments are selected in order to see the different implications for long-term ventures, investments and operating decisions.
- Industry projects: it projects how the current industry might evolve and what the organization can do to remain competitive and/or be a leader in this industrial future.
- Competitor scenarios: it tries to identify and analyze possible strategies that competitors might adopt in various circumstances.
- Technology scenarios: developed a better understanding of opportunities and risks in this scenario dimensions so that the organization can make better technological decisions.

Economic Value Added (EVA) (1990s):
The New York consulting firm Stein introduced and popularized the two shareholder value measures: EVA and Market Value Added (MVA). Given the limitations of previous accounting measures, several well-known firms (such as Coca-Cola, General Electric, AT&T, Whirlpool, Quaker, etc) began adopting EVA methods for evaluating their performance. As asserted by authors such as Wheelen and Hunger, 2002; Stern et al, 1995; Tully 1993; EVA has become an extremely popular shareholder value method of measuring corporate and divisional performance and may be on its way to replacing ROI as the standard performance measure.

Managers can improve their firm's or business unit's EVA by [1] earning more profit without using more capital, [2] using less capital and earning the same level of profit, and [3] investing capital in high-return projects. In their article " The Domain of Strategic Management: History and Evolution", Bowman, Singh and Thomas (2002) explains it concisely by putting the pro and cons of the EVA method:

> *By measuring the value added over all cost, including the cost of capital, EVA measures the productivity of all factors of production. It does not, by itself, tell a decision maker why a certain product or a certain services does not add value, or shed light on courses of action to recover value.*

Capacity Analysis (1990s and currently):
With the need to achieve consistency between the firm's resources and its strategy, its not surprising that waves of new approaches which are inwardly-focused are becoming more popular. Concepts such as Total Quality Management, reengineering, experience curve, and the learning organization delve into the internal analysis of activities within organizations. The need for a more holistic view of strategic thinking eventually gave rise to the popularity of RBV theory. This theory helps to bridge the gap by focusing on the relationship between internal analysis of the firm with external analysis of the industry and competitive environment. According to the RBV theory, a resource that is valuable in a particular industry and/or time, might not be valuable in a different industry or at a different time. The rate and direction of an organization's growth is influenced by how effectively management utilizes and develops its resource base; which in turn influences management decisions on the organization's feasible expansion paths, and the strategies it chooses to pursue (Grant, 1991; Peteraf, 1993).

However, these authors caution strategists to be objective when evaluating the value of their organization's resources. Failure to do so might cause strategies to fail. As stressed by Collins and Montgomery (1995), in order for a resource to qualify as a basis for effective strategy, it must pass a number of external market tests of its value. The tests are:

- ***Test of inimitability: Is the resource hard to copy?*** If a resource is inimitable, then the profit generated from it is likely to be more sustainable. Although competitors will eventually find ways to copy these resources, managers can forestall them by building their strategies around resources that have at least one of the following characteristics: [i] physical uniqueness, [ii] path dependency, and [iii] causal ambiguity.
- ***Test of durability: How quickly does this resource depreciate?*** The longer lasting a resource is, the more valuable it will be. Like inimitability, this test asks whether the resource can sustain competitive advantage over time.
- ***The test of appropriability: Who captures the value that the resource creates?*** Not all profits from a resource automatically flow to the company that 'owns' the resource. Basing a strategy on resources that are not inextricably bound by the company can lead to difficulty in achieving profits.
- ***The test of substitutability: Can a unique resource be trumped by a different resource?*** This test considers whether the organization have resources that can be substituted by competitors.
- ***The test of competitive superiority. Whose resource is really better?*** This test assesses the resources relative to competitor's in order to ensure that the company is able to exploit opportunities and/or neutralize threats in the competitive environment.

Another theoretical perspective that is closely related to the RBV is that of competence-based theory. Among the advocates of this theory are Sanchez, Heene and Thomas, 1996; Prahalad and Hamel, 1994; Stalk, Evans and Schulman, 1992. Prahalad and Hamel in their book *Competing for the Future* (1994), suggest that rather than behaving reactively, successful firms in the future strive not only to shape their existing competitive space, but to create new competitive spaces for themselves as well. According to them:

> *Companies that see strategy as primarily a positioning exercise are industry rule-takers rather than rule-breakers and rule-makers; they are unlikely to be defining entity in their industry, now or ever.*

In short, strategy is as much about competing for tomorrow's industry structure as it is about competing <u>within</u> today's industry structure. Competition within today's industry structure raises issues such as: What new features should be added to a product? How can we get better channel coverage? Should we price for maximum market share or maximum profits? Competition for tomorrow's industry structure raises deeper questions such as: Whose product concepts will ultimately win out? Which standards and product concepts will ultimately win out? Which standards will be adopted? How will coalitions form and what will determine each member's share of the power? And most critically, how do we increase our ability to influence the emerging shape of a nascent industry?"

COGNITIVE-BASED APPROACH TO STRATEGIC PLANNINNG

The cognitive-based approach to strategic planning has proved to be a significant approach for studying the strategic planning process. This is because the process involves not only the rational planned approach but also the use of intuitive judgment, influenced by the strategists' experience, culture belief, and value systems. Empirical research highlighted that among the positive aspects of intuition are that it can accelerate strategic decision-making and can serve as a substitute for procedural comprehensiveness or formalization of strategic planning (Mitchell and Thompson, 1994).

Political issues, and also differing interpretation and perceptions of the organization's strengths, weaknesses, opportunities and threats are also some of the cognitive-based factors that influence strategic planning process. More often than not, strategy is a compromise between planned intent, and the cultural and organizational constraints of the organization (Harrison, 1987).

With this in mind, understanding the composition of one's stakeholders is important, because it enables the strategists to assess the organization's adaptive capacity, its point of resistance, and its blind spots (Eden and Spender, 1998). Stakeholder priorities, dominant CEOs and corporate culture can create resistance to change, or result in strategies going through the hurdle of a difficult planning process which saw them being significantly changed to facilitate implementation. Johnson & Scholes (1999) acknowledge this phenomenon by stating that strategy development is the outcome of cultural and political processes. They define organizational culture as a *''deeper level of basic assumptions and beliefs that are shared by members of an organization, that operate unconsciously and define in a basic taken-for-granted fashion an organization's view of itself and its environment'*. According to them, these well-established beliefs are usually rooted in past experiences; while the political aspect

can mean stakeholders' influence leading to processes of bargaining, negotiation or perhaps edict to satisfy the different interest groups' expectations and priorities.

One school of though that delves into this concept of conflicting goals is that of Agency Theory. It posits that due to the split of ownership and control in organizations, there is usually a conflict in priorities between shareholders (principals) and managers (agents). This theory assumes that people are opportunistic and are bounded rationally, and therefore, managers will try to fulfill their own interests even at the expense of the shareholders. Meanwhile, research studies done by authors such as Hofstede 1993, Whittington 1992, and Mead 1994, have examined how the process of interpreting strategic issues may also be influenced by national culture and work systems. They pointed out that these differences would be expected to influence the degree of centralization, formalization, and political behavior both in gathering data on strategic issues, and the actual strategic planning process. For example, it may result in either a top-down formal strategic planning model, or a more informal 'adaptive' model.

There are also numerous other approaches to the study of cognitive processes such as cognitive psychology, decision processes, sociology of knowledge, etc. Although there seems to be consensus among researchers in regard to the conflicting priorities experienced by stakeholders in an organization; there tends to be differing views on how this conflict actually affects the organizational planning process. While some argue that conflict hinders effectiveness, other newer researches show that they can actually improve the decision quality. Eisenhardt (1999), based on her study of about twelve European, Asian and North American multi-business firms, concludes that the most effective strategists made choices that were fast, high quality, and widely supported. This is done by:

- Building collective intuition through frequent meetings and real-time metrics that enhance the ability of a top-management team to see threats and opportunities sooner and more accurately.
- Stimulating quick conflict to improve the quality of strategic thinking without sacrificing significant time.
- Maintaining a disciplined pace through time pacing, prototyping, and consensus that drives the decision process to a timely conclusion.
- Defusing political behavior that creates unproductive conflict and wastes time by emphasizing common goals and clear area of responsibility, and having fun.

According to Eisenhardt, rather than avoid conflict, high-stake decision-making needs divergent views among managers to stimulate innovative thinking, create fuller understanding of options, and improve decision effectiveness. She highlighted the methods that could be used to accelerate conflict, including assembling executive teams that are varied in age, gender, functional background and corporate experience; using "frame-breaking techniques"; and applying multiple alternatives through scenarios creations.

In addition to the above, another important element in cognitive-based research is the role of leadership in the planning process. For instance, research undertaken by Nutt, (1993) indicates that powerful decision makers often impose their ideas on a decision process, and although this creates a clarity of purpose, more often than not, this clarity could be misleading because it can sweep aside some of the sources of ambiguity and uncertainty.

Hence, there is a wide scope in the study of cognitive-based explanations of strategic planning and this aspect is being acknowledged by many authors such as Stubbart, Meindl and Porac (1994). According to them, although there are various cognitive theories that share much in common, they diverge around four central concepts, that are: rationality, the role of "mindless" or rote behavior, intended behavior, and whether cognitions are restricted to actions to be taken or include values and norms:

- *Mindlessness:* According to the new institutionalists, organizational members sometimes do habitual activities because they believe that "that is the way these things are done'. The theorists see this as mindless because the behaviors are brought into the organization not because they are rational, but because they are viewed as appropriate by external society. The counter arguments by other cognitive researchers state that rather than being routinized actions, this behavior is normally rooted because of past successes and is also important in order to increase efficiency in human decision making and actions (e.g., consistent decisions, or predictable action).

- *Rationality:* Traditional organization theorists have always defined rationality from the management perspective - in terms of organizational, economic and managerial viewpoints. Whereas more recently, both social scientists and managers have began to view it from a wider angle - as that from the actor's perspective, which govern perception, interpretation and action. Thus, the actor's desired outcomes and the actor's belief in the connection between intended action and desired outcome is what constitute rationality in this approach.

- ***Intended purpose:*** The "new institutionalists" view any behaviors adopted by an organization due to external environmental pressures/influence as being "without purpose". While another quarter note that behaviors and values taken from the society that enable the organization to get resources and avoid penalties are serving the intended purpose pursued by the organization.

- ***Maintenance activities:*** Maintenance activities are seen as important by some cognitive-based researchers because they help in preserving the organization's legitimacy in the larger society - such as insuring ethical behavior, preserving values, social responsibility, etc. Others view the maintenance activities as more about ensuring new pattern or dynamic changes that organizations need to make to face environmental conditions that may threaten the organizational survival.

SUMMARY

Notwithstanding the above views, academics and practitioners generally agree that the goal of the strategic planner is to build sustainable and profitable competitive advantage. Although there are many definitions of strategic planning, certain points stand out:

- It is likely to be concerned with the full scope of the organization's activities.
- It involves the matching of the activities of the organization to its resource capability and the environment in which it operates.
- It involves a significant commitment of resources.
- It involves a longer-term perspective

With this in mind, an organization's ability to strengthen its position is dependent on its ability to consistently make the optimal strategic choices. To achieve this, strategy involves making tough choices on three dimensions: which customers to focus on, which products/services to offer, and which activities to perform. Making the correct decisions on these three aspects is crucial because organizations sometimes make the mistake of entering businesses based on similarities of products rather than on the resources that contribute to the competitive advantages in each business. As emphasized by Collins and Montgomery in their article *Creating Corporate Advantage* (1998), as brilliant as any one strategy might be before its intended organization, it would not necessarily work well for all companies. This is because every organization starts at a different point, operates in a different context, and has fundamentally different kinds of resources and objectives.

REFERENCE

Ali, A. (1993), Decision-making style, individualism and attitude toward risk of Arab executives, *International Studies of Management and Organization*, 23 (3): 53-74.

Al-Jafary, A. and Hollingsworth, A. (1983), An exploratory study of managerial practices in the Arabian Gulf region'', *Journal of International Business Studies*, Fall: 143-52.

Andersen, Torben Juul, Strategic Planning (2000), Autonomous Actions and Corporate Performance, *Long Range Planning,* 33 (2000):184-200.

Andrews, K.R. (1971), *The Concept of Corporate Strategy*, Homewood, III: Dow-Jones Irwin.

Anslinger, P.L. and Copeland, T.E. (1996) Growth through Acquisitions: A Fresh Look, *Business Review,* January-February, pp. 126-35.

Arkes H. R., and Hammond K.R. (1986) *Judgement and Decision Making: An Interdisciplinary Reader,* Cambridge University Press.

Chandler, A. D. (1962) *Strategy and Structure: Chapters in the History of the Industrial Enterprise,* Cambridge, MA: MIT Press.

Cyert, R.M., and March, J.G. (1963), *A Behavioral Theory of the Firm*, Englewood Cliffs, NJ: Prentice Hall.

Chow, I.H. (1992), ``Chinese managerial work'', *Journal of General Management*, 17: 53-67.

Collis, D.J., and Montgomery C.A. (1998) Creating Corporate Advantage, *Harvard Business Review,* May-June.

Collis, D.J., and Montgomery C.A. (1995) Competing on Resources: Strategy in the 1990s, *Harvard Business Review,* July-August, pp.118-28.

David, Fred R. (2003), *Strategic Management: Concepts and Cases,* 9th Edition, Prentic Hall, New Jersey

De Wit, B., and Meyer, R. (1999) *Strategy Synthesis: Resolving Strategy Paradoxes to Create Competitive Advantage*, International Thomson Business Press.

Dunbar, E. and Katcher, A. (1990), ``Preparing managers for foreign assignments'', *Training and Development Journal*, September: 45.

Eden C., and Spender J.C. (1998) *Managerial and Organizational Cognition: Theory, Methods and Research,* Sage Publications.

Eisenhardt, K.M. (1999) Strategy as Strategic Decision-Making, *Sloan Management Review,* Spring (Special Issue) Vol. 40 i3, pp. 65(8).

Fukuyama, F. (1995), *Trust: The Social Virtues and the Creation of Prosperity*, Hamish Hamilton, London.

Gilley, B. (2000), Business: Management: Pulling Away, *Far Eastern Economic Review*, Hong Kong, pp 42-5.

Hamel, G. and Prahalad, C.K. (1994) *Competing for the Future,* Harvard Business School Press, Boston, MA.

Harding, C. (1994) *Managing Strategic Action: Mobilizing Change Concepts,* Sage Publication.

Haridas, T. (1983) Qualitative Research in Organizational Behavior, *Journal of Management Studies,* 20: 301-314.

Harrison, E Frank, and Pelletier, Monique A. (1998), Foundations of strategic decision effectiveness, Management Decision, 33 (7): 147-159.

Henderson, B.D. (1979) *On Corporate Strategy*, Abt Books, Cambridge, MA.

Hofer, C.W., and Schendel, D. (1978), *Strategy Formulation: Analytical Concept,* St Paul, MN: West Publishing.

Hofstede, G. (1993) Cultural Constraints in Management Theories, *Academy of Management Executive,* 7 (1).

Hoy, W.K.,, Miskel, C.G., 1991, *Educational Administration: Theory, Research, and Practice*, 4th edition, McGraw-Hill, New York.

Jankovic, A.D. (1991) *Business Research for Students,* Chapman Hall, London.

Johnson, G., and Scholes, K. (1999) *Exploring Corporate Strategy*, Prentice Hall Europe.

Mead R. (1994), *International Management: Cross-Cultural Dimensions*, Blackwell.

Meindl, J.R., Stubbart C., and Porac, J.F. (1996) *Cognition Within and Between Organizations,* Sage Publications.

Mintzberg, H. (1994), *Rise and Fall of Strategic Planning: Reconceiving Roles For Planning, Plans, and Planners*, Free Press, New York.

Mintzberg, I.H., Ahlstrand, B., and Lampel, J. (1998) *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management,* New York: Free Press.

Nutt, P.C. (1993) The Formulation Processes and Tactics Used in Organizational Decision Making, *Organization Science,* May, Vol.4, No.2.

Ohmae, K. (1983), *The Mind of the Strategist*, Penguin Books, Harmonsworth.

Papadakis, V., and Barwise, P. (1998) *Strategic Decisions,* Kluwer Academic Publishers.

Peteraf, M.A. (1993) The Cornerstones of Competitive Advantage: A Resource-Based View, *Strategic Management Journal*, March, pp. 179.

Porter, M.E. (1996) What is Strategy?, *Harvard Business Review,* November-December, pp. 61-78.

Sanchez, R., Heene, A. and Thomas, H. (eds) (1996) *Dynamics of Competence-Based Competition,* Elsevier, London.

Selmer, J. and de Leon, C. (1993), Chinese work values in Hong Kong, Singapore and Thailand, *International Journal of Commerce and Management*, 3 (3/4): 71-82.

Stalk, G., Evans, P., and Schulman, L.E. (1992) Competing on Capabilities: The New Rules of Corporate Strategy, *Harvard Business Review,* March-April, pp. 57-69.

Stern J., Stewart, B. and Chew, D. (1995), The EVA financial management systems, *Journal of Applied Corporate Finance,* 8:32-46.

Stubbart, C., Meindl, J.R., and Porac, J.F. (1994) *Advances in Managerial Cognition and Organizational Information Processing,* JAI Press Inc.

Suutari, R. (1999) Tale of Two Strategies: How Does Your Company Makes its Strategic Business Decisions?, *CMA Management,* Vol.73, July-August, pp. 12.

Tarter, C John; Hoy, Wayne K. (1998), Toward a contingency theory of decision making, *Journal of Educational Administration;* 36 (3): 212-228.

Tully, S. (1993), 'The real key to create wealth', *Fortune*, September 20: 38-50.

Wheelen, Thomas L., and Hunger, J. David (2002), *Strategic Management and Business Policy,* 8th edition,Prentice Hall-Pearson Education International, New Jersey.

Whittington, R. (1993) *What is Strategy – and Does it Matter?,* International Thomson Business Press.

Whittington, R. (1992) Putting Giddens into action: Social Systems and Managerial Agency, *Journal of Management Studies* 29 (6): pp. 693-712.

Leader-Member Exchange and Organizational Citizenship Behaviors: The Impact of Gender

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ABSTRACT

Past researches in the literatures on manager-employee attitudinal congruence have generally found that attitude similarities between managers and employees are linked positively to job-related outcomes. This research attempts to analyze the relationship between leader-member exchange (LMX) and Organizational Citizenship Behavior (OCB) among executives employed in East Malaysian manufacturing organizations. Moderating the above variables is the gender of the supervisors and subordinates. The findings suggested that LMX has significant implication on citizenship behaviors performed by subordinates. It was also noted that, gender dissimilarity was found to moderate the relationship between LMX and OCB resulting in subordinates reluctance to perform citizenship behaviors.

INTRODUCTION

Management behavior is an important area of study as it can provide assistances or guidelines to the management on the appropriate method of developing the most effective workforce. Lord and Brown (2001) found that leadership works best when there is a match between the identity level of followers and the focus of leaders, as people of similar behavior tend to be attracted to each other. Past researches in the literature on manager-employee attitudinal congruence have generally found that attitude similarities between managers and employees are linked positively to job-related outcomes. Supervisor-subordinate interactions and unequal power distributions are some pervasive features of modern organizations. Having said that, a better understanding of these effects will offer insights into positively influencing employees' behavior. The major concern of organizations nowadays is establishing effective leadership management and the core element in developing effective leadership management is the quality level of exchange relationship between superiors and subordinates.

The leader-member exchange (LMX) and Organizational Citizenship Behavior (OCB) have become the foundation of a new era of managing a diversified workforce in the advent of globalize world. Sarawak, a state located in East Malaysia, has gone through rapid transformation from primary sector such as agriculture and mining to a highly skilled manufacturing sector in the 1990s. Thus, understanding the relationship between supervisors and subordinates would serve as a platform for supervisors to assist them in develop an OCB culture among their subordinates through favorable LMX or social exchange relationship between superiors and their subordinates.

The major objective of this particular research is to promote awareness among the superiors with regards to the importance of understanding and practicing LMX as an effective medium interaction between superiors and subordinates as well as fostering OCB among subordinates.

The major concern of this research is to determine whether the LMX theory and OCB are applicable in the manufacturing companies located in Sarawak. This research attempts to answer the following questions:

- How would the Leader-Member Exchange (LMX) affect the Organizational Citizenship Behavior (OCB) among the employees?
- How would the gender of supervisors and subordinates moderate the relationship between LMX and OCB?

LEADER-MEMBER EXCHANGE (LMX)

LMX theory was first illustrated in the works of Dansereau, Graen, and Haga (1975) 29 years ago and has recently been gaining momentum. Many studies have been conducted to investigate the role the supervisor plays in his or her relationship with subordinates. Essentially, the supervisor, the subordinate, or both will evaluate the relationship according to the quality of the interaction and these perceptions have a fundamental influence on individual outcomes. As mentioned by Murry, Sivasubramaniam, and Jacques (2001), the positive exchanges are typically reciprocated with positive outcomes from the subordinates. Each member of the dyad has the other's best interest at heart and this is reflected in more supportive behavior.

LMX describes the relationship between a leader and a subordinate and how they influence each other in an organization and examined their interdependencies (Yukl, 1998; Scandura, 1999). Early works in LMX have found two types of relationships between the subordinate and supervisor, namely the in-group and the out-group. In-group refers to linkages based on expanded and negotiated role responsibilities, which are not specified in the employment contract and conversely out-group is based on the formal employment contract. Subordinates in the in-group are claimed to have more power as they receive more information, are more influential and confident, and have personal concern from their leaders as compared to the out-group subordinates (Liden, Wayne, & Sparrowe, 2000). In-group members are willing to do extra tasks and to which their leaders will reciprocate (Graen & Scandura, 1987) but out-group members receive lesser attention and support from their leaders and thus might see their supervisors as treating them unfairly.

Many literatures in the past have revealed that supervisors do differentiate between their subordinates in terms of the exchange. It is an advantage to be in a high LMX as it is associated with higher trust, greater warmth and support, and there is more frequent interaction between the members of the dyad (Dansereau et al., 1975; Brower, Schoorman, & Tan, 2000). Most current LMX researches depart from previous LMX research by looking into other analysis as long as the relationship remains the focus. Recently, LMX has been related to behaviors such as organizational citizenship behaviors (Settoon, Bennett, & Liden, 1996; Wayne, Liden, Graf, & Ferris, 1997; Deluga, 1998; Hui, Law, & Chen, 1999), task performance (Howell & Hall-Merenda, 1999; Hui et al., 1999; Settoon et al., 1996; Wayne et al., 1997), turnover intentions (Ansari, Daisy, & Aafaqi, 2000), managerial roles congruence (Lim, 2001), organizational outcome (Omar, 2001), conflict handling style (Oh, 2002), and influence tactics (Liew, 2003).

LMX literatures had found that subordinates in high-quality exchange relationships received more desirable assignments, more rewards, and had greater support from their supervisors. This is congruent with the social exchange theory, where individuals who are engaged in high-quality relationship will behave in such a way that their exchange partner will also get the benefits (Murphy, Wayne, Liden, & Erdogan, 2003).

ORGANIZATIONAL CITIZENSHIP BEHAVIORS (OCB)

Organizational citizenship behaviors or as it is also known as extra-role behaviors, are the act of performing beyond the stated job requirement. Subordinates impulsively go beyond the employment contract and carry out non-obligatory task without expecting explicit rewards and recognition (Organ, 1988).

In addition to that, citizenship behaviors can be explained based on the psychological contract between employees and organizations, where the core element in the contract is reciprocity obligations between employees and organizations (Masterson & Stamper, 2003; Thomas, Au, & Ravlin, 2003). Organizations have the obligation in terms of providing to employees benefits, such as career advancement, promotions, job security, training, and increased salary. In return, the employees' responsibility to the organization will include loyalty, helping colleagues, willing to work overtime, and accept tasks that are beyond normal job requirement.

In summary, OCB is the extra-role behavior exhibit by employees, which go beyond the formal job requirement without expecting recognition in term of either explicit or implicit rewards from the supervisors. The effect of OCB is more likely to promote positive social and working environment while maintaining the performance of a work unit relative to the core products of the organizations.

Five Dimensions of Organizational Citizenship Behaviors

OCB can be classified into five categories that contribute to organizational effectiveness which include altruism (helping), courtesy, conscientiousness, civic virtue, and sportsmanship (Organ, 1988). Smith, Organ, and Near (1983) defined altruism as voluntary behaviors where an employee provides assistance to an individual with a particular problem in completing his/her task under unusual circumstances. Courtesy includes behaviors, which focus on the prevention of problems and taking the necessary step so as to lessen the effects of the problem in

the future. Organ (1988) defined sportsmanship as the behaviors of warmly tolerating the irritations that are an unavoidable part of nearly every organizational setting. According to Deluga (1998), civic virtue includes subordinate participation in organization political life and supporting the administrative function of the organization. Meanwhile, conscientiousness is considered as one of the personalities of the "Big Five Dimensions of Personality," which is used to indicate that a particular individual who is organized, accountable and hardworking. Besides that, studies have also revealed that conscientiousness can be related to organizational politics among employees (McCrae & Costa, 1987).

The Impact of Organizational Citizenship Behaviors on Organizational Effectiveness

Prior studies had disclosed that OCB has significant implication on the organizations' output. In a research conducted by Podsakoff, Ahearne, and Mackenzie (1997), they found that there is a positive correlation between OCB and an organization's outcomes. This is due to OCB being able to foster the effectiveness of organizations in terms of achieving a higher level of work group performance from the perspective of quantity and quality of work. According to Aquino and Bommer (2003), they discovered that OCB can enhance the social attractiveness in a work unit. As OCB is normally labeled as positive behaviors, those who exhibit OCB may become more socially attractive which makes them more likely to be appreciated as friends or partners. Consequently, this may create a favorable working environment in a work unit.

GENDER

According to Wayne, Liden, and Sparrowe (1994), there are two approaches of gender effect on LMX, which is known as similarity-attraction approach revealed by Byrne (1971). The approach conceptualized that similarity between leader and member may lead to increase liking and thus influence their exchange relationship. Meanwhile, the other approach which is known as situational approach is related to proving that situational variables such as formal authority, experience and influence may affect the gender effect in developing exchange relationship between leader and member.

According to Xin and Pelled (2003), role conflict may arise from task conflict and emotional conflict that may leave significant impact on the social exchange between superiors and subordinates. Therefore, the outcome of their study indicated that female leaders with female members develop a favorable relationship in term of high ratings and liking by leaders and has a very low level of role conflict and ambiguity. Tsui and O'Reilly (1989) discovered that gender dissimilarity between leader and member may lead to unfavorable social exchange due to low level of liking of members by leaders and high degree of role conflict.

LMX and OCB

The social exchange theory complements the foundation of LMX as the theory emphasizes on the purpose that leaders and members attempt to develop and maintain the exchange relationship (Graen & Scandura, 1987; Graen & Uhl-Bien, 1995; Sparrowe & Liden, 1997). Graen and Scandura (1987) concluded that leaders and members must provide something, which is perceived to be valuable by each party, and that the exchange must be balanced. In addition, employees not only require tangible materials but would also need social support in terms of psychological and emotional support. Further studies also supported that the exchange between leaders and members covers a range of specific resources such as information to emotional support. High quality of LMX comes from the perception of the value of material being exchange between leaders and members (Graen & Uhl-Bien, 1995).

Prior studies have revealed that LMX is influenced by the four main factors, which in turn become the determinant of the quality of the exchange relationship between leaders and members. As a result, the four dimensions may affect the quality of LMX in a work unit and thus influence the level of OCB exhibited by the employees. If the employees perceived the quality of LMX as high, this may encourage them to perform citizenship behaviors for the work unit and organizations. Scandura and Graen (1984) revealed that the cycle of citizenship behavior for reciprocal accomplishment of goals helps further strengthened the quality of the LMX. This is supported by other researchers, where they suggested that in-group members or a work unit that has a high quality of LMX may receive various types of rewards that are formal and informal (Settoon, Bennett, & Liden, 1996). Members would performed extra-roles by providing citizenship behavior to the supervisors who in exchange provide more mutual support and greater opportunities to the members.

Correspondingly, according to Deluga (1998), as a subordinate who perform OCB will not be formally rewarded, he or she may be informally rewarded in term of supplementary resources and support from the leader. Consequently, the subordinate will be motivated to continue to maintain the favorable relationship. Despite that, Aquino and Bommer (2003) noted that the person who received some benefits from others may indirectly have the tendency to return or feel obligated to return the favor and this interaction is known as

positive reciprocity. This kind of interaction can also be applied in the context of relationship between LMX and OCB. This is because when the leader trusted a particular subordinate and provide certain advantages to him or her in term of greater authority, more support and so forth, consequently the subordinate may feel to payback the favor to the leader. This can be done by performing behaviors that are beyond the formal employment contract, which is known as citizenship behaviors.

Taken together, LMX has significant influence on the level of OCB among employees as a high quality of LMX may motivate employees to exhibit extra-role behaviors without any formal rewards from the organizations.

RESEARCH METHODOLOGY

The respondents of this study are the executives employed in manufacturing companies located in Sarawak, Malaysia. A total of 10 manufacturing companies have been identified for this study. The questionnaires have been classified into two components where the first component is to determine the social exchange relationship between superiors and subordinates in a work unit. Meanwhile the other component of the questionnaires is to identify the level of OCB performed by subordinates in a work unit.

The relationship between superiors and subordinates were measured based on the questionnaires LMX-MDM developed by Liden and Maslyn (1998). This questionnaire has twelve items, which can be categorized into four dimensions so as to provide a multidimensional approach. From the perspective of OCB, there will be 20 questions used to determine the level of citizenship behaviors among subordinates based on five main dimensions. Likert-like scale will be used to measure both LMX and OCB elements, which ranks from 1 (Strongly Disagree) to 7 (Strongly Agree).

FINDINGS

Table 1 shows the demographic profile of the respondents.

Table 1: Demographic Characteristic of Respondents

Demographics		Frequency	Percentage
Subordinates' Gender	Male	63	61
	Female	40	39
Superiors' Gender	Male	69	67
	Female	34	33
Period of Working with Superiors	Less than 1 year	6	5.8
	1 - 2 years	48	46.6
	3 - 4 years	35	34
	More than 5 years	14	13.6
Races	Chinese	58	57
	Malay	20	19
	Others	25	24
Age (years)	16-20	4	3.9
	21-25	28	27.2
	26-30	39	37.8
	31-40	29	28.2
	41-50	3	2.9
Education Background	High school	32	31
	Diploma	39	37.9
	Degree	28	27.2
	Others	4	3.9
Working Experience	Less than 1 year	3	2.9
	1 - 5 years	62	60.2
	6 - 10 years	27	26.2
	More than 10 years	11	10.7
Monthly Gross Salary	Less than RM1,500	35	34
	RM1,500 - RM3,000	56	54.3
	RM3,001 - RM4,500	11	10.7
	RM4,501 - RM6,000	1	1
Nationality	Malaysian	94	91.3
	Non-Malaysian	9	8.7
Company Status	Locally Owned Company	81	78
	US Based Company	16	16
	Others	6	6

Table 2 presents the result of correlations and regression analysis. As can be seen from the table, LMX can explain 24% of the behavior of OCB. This indicates that there is a significant relationship between LMX and OCB with the Pearson Correlation at 0.494 and significance value at 0.000. Therefore, the level of exchange relationship between leader and member has a positive relationship on the level of organizational citizenship behaviors exhibited by the member in a work unit.

Table 2: Analysis Results

	OCB
LMX	0.49**
R^2	0.244
Adjusted R^2	0.236
F value	32.525**

** $p < 0.01$.

A total of five-2-step hierarchical multiple regression analysis was carried out to test the hypotheses that comprised the direct and interacting effects of LMX, gender on OCB. Table 3 tabulated the data obtained from these analyses. The following sections discussed the results.

Table 3: Hierarchical Regression Results Using Gender as a Moderator in the Relationship Between LMX and OCB

Independent Variable	altruism		courtesy		conscientious-ness		civic virtue		Sportsman-ship	
	R^2	Beta	R^2	Beta	R^2	Beta	R^2	Beta	R^2	Beta
Model Variables	.31		.10*		.17**		.27**		.15**	
Affect	**	.06		-.11		.11		-.06		-.09
Loyalty		-.04		.06		-.03		.15		.22*
Contribution		.53**		.32*		.27*		.28*		.38**
Respect		.01		.03		.09		.23		-.21
Moderating Variable	.00		.01		.01		.06**		.04**	
Gender (Leader)		.02		-.08		-.07		-.25**		-.20**
Interaction Effect	.02		.03		.04		.04		.02	
Affect*Gender (Leader)		-.97		.45		-.72		1.44*		-.28
Loyalty*Gender (Leader)		.04		-1.17		-.09		-.94		-.73
Contribution*Gender (Leader)		-.70		-.39		-1.2		-.46		-.37
Respect*Gender (Leader)		.80		.45		1.13		-.61		-.93

Note: *$p < 0.05$, **$p < 0.01$, $R^2 = R^2$ change for each step; Beta=Standardized beta coefficients.

Altruism

Altruism is one of the five dimensions in OCB. Step 1 was found to be significant (p>.01). Hence the direct effects of the predictors significantly explained 31% of the variability in altruism. Only one dimension in LMX-contribution was found to be significantly predictive of the altruism. The resultant incremental variance of 2% in entering step 2 was not significant. This indicated that the interaction effects of LMX and gender of the supervisors did not predict altruism element in OCB.

Courtesy

In the analysis of courtesy, step 1 was found to be significant (p<.01). Same as in altruism, contribution was found to be the significant contributor. Step 2 was found to be insignificant, therefore, collectively, the predictors did not interactively predicted the used of courtesy in OCB.

Conscientiousness

In analyzing conscientiousness, the main effects of the predictors are significant at .01 level (p<.01), explaining a total of 17% of the variability in the use of conscientiousness. It was found that contribution was the sole significant contributor in predicting the behavior of conscientiousness. Step 2 was not insignificant, indicated that collectively the moderating effect of gender on the relationship between interaction of the predictors and conscientiousness was not existed.

Civic Virtue

The analysis on civic virtue revealed that the main effects of the predictors on the criterion behavior were significant (p<.01). Specifically, contribution and gender of the supervisor were the significant contributors to civic virtue.

Sportsmanship

Step 1 was found to be significantly predictive of sportsmanship dimension in OCB (p<.01), explaining 15% of the variability. Two dimensions in LMX--loyalty and contribution, and gender were found to be significantly predictive of sportsmanship.

DISCUSSION AND CONCLUSION

LMX and OCB are two essential components related to establishing favorable relationship between superiors and subordinates and therefore motivate subordinates to perform extra-role behaviors. A number of researchers have revealed that there is significant relationship develop between LMX and OCB in a work unit. They also discovered that high quality of LMX would lead to positive behaviors or OCB being exhibited by subordinates. In this particular study, the outcomes of the analysis indicate that LMX has significant relationship with OCB in a work unit based on the data sample covering manufacturing companies in Sarawak.

Furthermore, the correlations result also indicated that the relationship between LMX and OCB is a positive relationship, which is congruent with the findings of Deluga (1994) as well as Settoon, Bennett, and Liden (1996). The significant relationship between LMX and OCB in this study is due to the high quality of social exchange developed between superiors and subordinates that have motivated the subordinates to perform citizenship behaviors in their respective workplace.

The study has proven where the strong positive correlation values for LMX determinants such as professional respect, affect, contribution, and loyalty, indicated that a high quality of social exchange is established between superiors and subordinates. This denotes that high quality of LMX between superiors and subordinates would induce the subordinates to attain a high level of OCB and vice versa. Therefore, this finding was also supported by other researches such as Hui, Law, and Chen (1999), where subordinates with a high degree of LMX or otherwise known as the in-group will perform higher degree of OCB. The main reason could be due to the fact that the interaction presented between superiors and subordinates is a reciprocal relationship and thus relies very much on the degree of exchange in term of access to information, support, time, and greater authority (Scandura & Graen,1984; Deluga, 1998).

Consequently, the favorable exchange relationship will bring about the citizenship behaviors from the subordinates. The act of performing extra-roles behaviors by subordinates is influenced by the fact that when subordinates receive or accept favors from their superiors, like for example, greater autonomy or minimum supervision, this will cause the subordinates to feel oblige to restore the good deed of their superiors by performing OCB. This is further supported by Aquino and Bommer (2003), where this relationship is known as positive reciprocity.

Based on these results, it may be concluded that the predictors were directly predictive of OCB particularly contribution dimension of LMX. The moderating effects of gender on the interaction terms of other predictors were not significant for OCB, indicated that gender did not affect the studied relationships as a moderator.

Gender similarity between superiors and subordinates did not affect the relationship between LMX and OCB. This is mainly because subordinates who performed citizenship behaviors in the workplace did so because of the high quality of social exchange, which existed between superiors and subordinates. This finding was supported by Duchon, Green, and Taber (1986) where gender similarity between superiors and subordinates would lead to high quality social exchange being established between superiors and subordinates. Correspondingly, this is further supported by Tsui and O'Reilly (1989), where gender similarity between superiors and subordinates would enhance the level of interpersonal liking, reduce role of conflict and ambiguity between superiors and subordinates, thus contributing to high quality of LMX.

On the other hand, gender dissimilarity between superiors and subordinates would also influence the subordinates to perform citizenship behaviors. The possible explanation for this phenomenon is due to the perception among male subordinates towards their female superiors (Terborg, 1977). Male subordinates may perceived their female superiors as inexperienced and have a lower level of authority as compared to male superiors. As a result, female superiors were unable to manage and influence their male subordinates effectively and subsequently would discourage male subordinates from performing extra-role activities in a work unit. Furthermore, the findings based on Stoeberl, Han, and Bae (1998) may as well provide further explanation on the gender dissimilarity issue, where female superiors were shown to be in a position when managing feminine group instead of the masculine group.

The other observation was that female superiors were unable to motivate male subordinates to perform citizenship behaviors although the level of LMX is high. Male superiors might have the tendency to delegate challenging tasks to male subordinates instead of female subordinates and this is probably due to their low level of confidence on the female subordinates' capability. As a result, female subordinates in this study would view the social exchange relationship with their male superiors as inequitable or discriminatory.

The perceived unbalanced treatment by male superiors towards their female subordinates as compared to male subordinates would thus discourage female subordinates from performing citizenship behaviors in the workplace. In addition to that, the fact that male superiors had less influence on the feminine group as based on Stoeberl, Han, and Bae (1998), could also be the possible reason behind the inability of male superiors in motivating female subordinates to performed extra-role activities that are not specified in the job description.

REFERENCES

Aquino, K., & Bommer, W. H. (2003). Preferential mistreatment: How victim status moderates the relationship between organizational citizenship behavior and workplace victimization. *Organizational Science, 14*, 4, 374-385.

Ansari, M. A., Daisy, K. M. H., & Aafaqi, R. (2000). Fairness of human resource management practices, leader-member exchange, and intention to quit. *Journal of International Business and Entrepreneurship, 8*, 1-19.

Brower, H. H., Schoorman, F. D., & Tan, H. H. (2000). A model of relational leadership: The integration of trust and leader-member exchange. *The Leadership Quarterly, 11,* 227-250.

Dansereau, F., Graen, G., & Haga, W. (1975). A vertical dyad approach to leadership within formal organizations. *Organization Behavior and Human Performance, 13,* 46-78.

Deluga, R. J. (1998). Leader-Member exchange quality and effectiveness ratings: The role of subordinate-supervisor conscientiousness similarity. *Group and Organizational Management, 23*, 189-216.

Duchon, D., Green, S., & Taber, T.D. (1986). Vertical dyad linkage: A longitudinal assessment of antecedents, measures, and consequences. *Journal of Applied Psychology, 71*, 56-60.

Graen, G. B., & Uhl-Bien, M. (1995). Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *Leadership Quarterly, 6*, 219-247.

Graen, G. B., & Scandura, T. A. (1987). Toward a psychology of dyadic organizing. *Research in Organizational Behavior, 9,* 175-208.

Howell, J. M., & Hall-Merenda, K. E. (1999). The ties that bind: The impact of leader-member exchange, transformational and transactional leadership, and distance on predicting follower performance. *Journal of Applied Psychology, 84*, 680-694.

Hui, C., Law, K. S., & Chen, Z. X. (1999). A structural equation model of the effects of negative affectivity, leader-member exchange, and perceived job mobility on in-role and extra role performance: A Chinese case. *Organizational Behavior and Human Decision Processes, 77*, 3-21.

Liden, R. C., Wayne S. J., & Sparrowe, R. T. (2000). An examination of the mediating role of psychological empowerment on the relations between the job, interpersonal relationships, and work outcomes. *Journal of Applied Psychology, 85*, 407-416.

Liew, L. L. (2003). Downward influence tactics: the impact of leader-member exchange, affectivity, and gender. Unpublished DBA thesis. Penang: University Science Malaysia.

Liden, R. L., & Maslyn, J. M. (1998). Multidimensionality of leader-member exchange: An empirical assessment through scale development. *Journal of Management, 2*, 1, 43-72.

Lim, J. C. (2001). Managerial roles congruence and leader-member exchange. Unpublished MBA thesis. Penang: University Science Malaysia.

Lord, R. G., & Brown, D. J. (2001). Leadership, values, and subordinate self-concepts. *The Leadership Quarterly, 12*, 133-152.

Masterson, S. S., & Stamper, C. L. (2003). Perceived organizational membership: An aggregate framework representing the employee-organization relationship. *Journal of Organizational Behavior, 24*, 473-490.

McCrae, R. R., & Costa, P. T. Jr. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*, 81-90.

Murphy, S. M., Wayne S. J., Liden, R. C., & Erdogan, B. (2003). Understanding social loafing: The role of justice perceptions and exchange relationships. *Human Relations*, *56*, 1, 61-84.

Murry, D. W., Sivasubramaniam, N., & Jacques, P. H. (2001). Supervisory support, social exchange relationship, and sexual harassment consequences. A test of competing models. *The Leadership Quarterly, 12,* 1-29.

Organ, D. W. (1988). *Organizational Citizenship Behavior: The Good Soldier Syndrome*. Lexington, MA: Lexington Books.

Oh, S. H. (2002). Subordinates' conflict handling styles: The impact of supervisory bases of power and leader-member exchange. Unpublished MBA thesis. Penang: University Science Malaysia.

Omar, F. (2001). Downward influence tactics, leader-member exchange, and organizational outcomes. Unpublished MBA thesis. Penang: University Science Malaysia.

Podsakoff, P. M., Ahearne, M., & MacKenzie, S. B. (1997). Organizational citizenship behavior and the quantity of work group performance. *Journal of Applied Psychology*, *82*, 262-270.

Scandura, T. A. (1999). Rethinking leader-member exchange: An organizational justice perspective. *Leadership Quarterly*, *10*, 1, 25-40.

Scandura, T. A., & Graen, G. B. (1984). Moderating effects of initial leader-member exchange status on the effects of a leadership intervention. *Journal of Applied Psychology, 69*, 428-436.

Settoon, R. P., Bennett, N., & Liden, R. C. (1996). Social exchange in organizations: Perceived organizational support, leader-member exchange, and employee reciprocity. *Journal of Applied Psychology, 81*, 219-217.

Smith, C. A., Organ, D. W., & Near, J. P. (1983). Organizational citizenship behavior: Its nature and antecedents. *Journal of Applied Psychology, 68*, 653-663.

Sparrowe, R.T., & Liden, R.C. (1997). Process and structure in leader-member exchange. *Academy of Management Review*, *22*, 2.

Terborg, J. R. (1977). Women in management: A research review. *Journal of Applied Psychology, 62*, 647-664.

Thomas, D. C., Au, K., & Ravlin, E. C. (2003). Cultural variation and the psychological contract. *Journal of Organization Behavior, 24*, 451-471.

Tsui, A. S., & O'Reilly, C. A. (1989). Beyond simple demographic effects: The importance of relational demography in supervisor-subordinate dyads. *Academy of Management Journal*, *32*, 402-423.

Wayne, S. J., Liden, R. C., Graf, I. K., & Ferris, G. R. (1997). The role of upward influence tactics in human resource decisions. *Personnel Psychology 50*, 979-1006.

Wayne, S. J., Liden, R.C., & Sparrowe, R. T. (1994). Developing leader-member exchanges: The influence of gender and ingratiation. *American Behavioral Scientist, 37*, 5, 697-714.

Xin, K. R. & Pelled, L. H. (2003). Supervisor-subordinate conflict and perceptions of leadership behavior: A field study. *The Leadership Quarterly*, *14*, 25-40.

Yukl, G. A. (1998). *Leadership in organizations* (4th ed.). Englewood Cliffs, NJ: Prentice-Hall.

Knowledge Management as a Competitive Tool in the Legal Profession

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ABSTRACT

Although it is recognized that the knowledge economy has arrived, and that knowledge is a key business asset, organizations are still in the early stage of understanding the implications of knowledge management. Knowledge management is promoted as an important and necessary tool for organizations in obtaining competitive advantage. This study draws attention to the process of knowledge management in law firms in Johor Bahru. The process includes knowledge identification, knowledge acquisition, knowledge application, knowledge sharing, knowledge creation and knowledge preservation. A mail survey was conducted on 205 legal firms in Johor Bahru. Of this, only 53(25.9%) duly completed and returned the survey questionnaires. It was found that generally, law firms in Johor Bahru do implement knowledge management. Results also indicated that knowledge application was the most widely used amongst the respondents whilst knowledge creation was the lowest. The relationship between each process of knowledge management and firm's reputation was also identified in this study. It also points out that knowledge management has positive correlations with firm's reputation. Recommendations to enhance knowledge management in the legal professions are also presented.

INTRODUCTION

The Eighth Malaysia Plan, was launched in 2001 as the first phase of the Third Outline Perspective Plan (2001-2010), with the intention to translates into action the National Vision Policy that aims at enhancing competitiveness and strengthening economic resilience. In line with this plan, policies were drafted in mind to achieve sustainable growth with macroeconomic stability. These policies include encouraging further domestic and foreign investment, improving productivity and innovation, enhancing technological development, developing quality human resource as well as accelerating the transition to a knowledge-based economy. That the Malaysia's government commitment to accelerate the transformation to a knowledge-based economy was seen with the launching of the Knowledge-Based Economy Master Plan (KEMP) in 2002. The KEMP contains 136 recommendations encompassing human resource development, infostructure, incentives, science and technology development, reorientation of the private and public sectors as well as addressing the digital divide. The Government also monitored the progress towards a knowledge based economy on the basis of the Knowledge-Based Economy Development Index5 (KDI). Currently, Malaysia remained at 17th position and still continued to remain ahead of the developing regional economies in this aspect.

The government efforts did not go unnoticed by the Malaysian researchers. Study by Narayanan, Richardson and A. Latif (2003) on engineering companies in Kuala Lumpur indicated that 65% of the respondents agreed that costly mistakes could be avoided had employees possessed sufficient knowledge or expertise. Thus, enterprises which leverage its intellectual resources can alter its competitiveness. Leading firms therefore are finding that, to remain competitive, they must managed their organization's knowledge and expertise as uses it as a tool to increase firm's competitive value.

PROBLEM STATEMENT

Knowledge embedded in the organization's business processes and employees' skills provide firms with unique capabilities to deliver customers with a product or service. The need to manage knowledge actively becomes more obvious when what you sell is knowledge. Consulting firms like the legal fraternity represent an industry, which seems well suited for knowledge management investigation (Lamb, 1999). They are knowledge intensive, and the use of advanced technology may transform these organizations in the future (Gottschallk, 1999). Furthermore, consulting firms had always considered knowledge to be a core capability for achieving competitive advantage (Chard, 1997; Pasternack & Viscio, 1998). Hence, knowledge management has become the logical path for these firms to take. This is made even more critical if the organization's knowledge is held under the custody of a few, which generally sums up the environment of the legal profession. Pasternack and

Viscio (1998, p.96), proposed that "where much of the key knowledge is held by individuals, unless there is some structure to retain it within the organizational memory, when a person leaves the organization a mass of knowledge goes right out the door with that person".

The question now is whether legal firms in Malaysia realize the importance and the role of knowledge management, KM as a competitive tool to increase a firm's competitive advantage. Do they realize the effects of KM on their firm's performance? This study is done to identify the relationship between KM and competitiveness in the legal profession.

OBJECTIVE OF THE STUDY

The purpose of this study is to determine whether legal firms in Johor Bahru Bahru implement knowledge management and if they do to what extent. The researchers also wish to identify the   relationship between knowledge management and firms' financial performance. The legal firms were chosen in this study because of their impacts on the social web of Johor and the proximity of Johor Bahru to Singapore where competition from across the border is very real especially in relation to international activities.

LITERATURE REVIEW

Clarke and Rollo (2001) define data as a set of discrete objective facts, which is presented without judgement or context. Information is the output of data that is categorized, analyzed, summarized and placed in context so as to become intelligible to the recipient. In other words, data becomes information when it is manipulated, represented and interpreted to reduce uncertainty, give surprises or insights and allow or improve decision-making (Earl, 1983). When information is used to make comparisons, assess consequences, establish connections and engage in dialogues, knowledge is then created. Hertog and Huizenga (1997) defined knowledge as a collection of information and rules with which a certain function can be fulfilled. Weggeman (1997) sees knowledge as a personal capacity and it is the product of the information, the experience, the skills and the attitude, which someone has acquired at a certain point in time.

According to Bhatt (2001), data is considered as raw facts while information is an organized set of data. When information becomes meaningful it is perceived as knowledge. The relationship between data, information and knowledge is recursive. Raw data is selected according to its relevance to the user. It is then processed so that the data becomes information. The application of information contributes to the creation of knowledge. Thus, knowledge refers to the capability to interpret data and information through a process of giving meaning to the data and information as illustrated below.
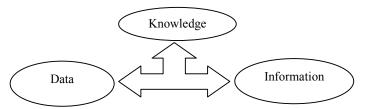
Figure 1 : The recursive relations between data, information and knowledge
Source : Ganesh D. Bhatt, 2001, p.69

"Knowledge is usually divided into explicit and tacit knowledge" (Preiss, 1999, p.37). Tacit knowledge is the unarticulated knowledge. It is in a person's head and difficult to describe and transfer. This type of knowledge includes lessons learned, know-how, judgment, rules of thumb, and intuition (O'Dell & Grayson, 1998). Tacit knowledge is also automatic, requires little time or thought and helps determine how organizations make decisions and influence the collective behavior of their members (Liebowitz & Beckman, 1998). According to Smith (2000), tacit knowledge at the workplace is practical, action-oriented knowledge that is acquired through personal experience, is seldom expressed openly and often resembles intuition. Although the effective utilization of tacit knowledge is essential for competitiveness, the problem with tacit knowledge is that it is difficult to capture. Tacit knowledge is embedded in company practices and also the people in an organization. Thus, it is highly personalized, context-sensitive and very difficult to measure and manage (Clarke & Rollo 2001).

Explicit knowledge refers to the knowledge that exists in a given collection of data and rules in a reasonable time (Bollinger & Smith, 2001). It can be expressed in words and numbers. It can be shared in the form of data, scientific formula, specifications and manuals (Civi, 2000). It can also migrate into the business community and

made accessible to most companies regardless of their active cooperation. Compared to tacit knowledge, explicit knowledge is clearly formulated, easily expressed without ambiguity, then codified and stored in a database where it can be accessed and used easily by the individuals in an organization. Once codified, explicit knowledge assets can be used to solve many similar types of problems or connect people with variable and reusable knowledge (Smith, 2001).

Knowledge management, KM according to Davenport *et al.* (1998), means exploiting and developing the knowledge assets available to the organization in achieving organizational objectives. It embodies the management of the two branches of knowledge namely explicit and tacit knowledge. The management of knowledge includes a few processes namely knowledge identification, sharing and creation. These processes require systems to create and maintain knowledge repositories, to cultivate and facilitate the sharing of knowledge and organizational learning. Bhatt (2001) defines KM as a process of creating, validating, presenting, distributing and applying knowledge. These five phases in KM allows an organization to learn, reflect and unlearn and relearn. However, knowledge is not static (Malhotra, 1998). Knowledge that is acquired needs to be evaluated over time to ensure its relevance. Hence, the element of knowledge preservation and knowledge evaluation need to be incorporated into KM. These elements are as shown:
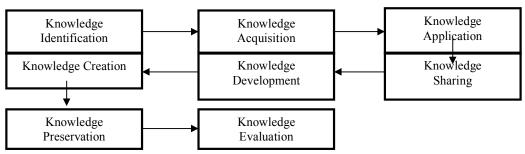
Figure 2: The eight elements of KM process
Source : Frank Management Center, 2002

Competitive tool refers to the accessories, which gives a competitive edge in the bid to achieve a goal. The competitive tool is essential in creating the existence of a competitive advantage for a firm. Bharadwaj et al. (1993) highlighted the importance of organizational learning and expertise as a source of competitive advantage. The further definition noted by Winter (1987), who suggested that organizational learning will be a source of competitive advantage if the learning is "tacit" and if the underlying knowledge is complex. It is because this will result in making imitation difficult. Osbaldeston and Barham (1992) argued that management development can become a source of competitive advantage. By linking management training and development to business strategy, management can become a way to reshape organizational culture, and implement strategies. This argument is supported by Swiercz and Spencer (1992), who proposed that human resources, if managed correctly, provides a valuable source of competitive advantage. Building on this, in a fast-changing environment like the legal profession, the ability to exploit the power of knowledge development will definitely leverages an organization against its competitors

METHODOLOGY

The survey method was employed in this study. The instruments were divided into three sections consisting of respondent's demographic information, a list of 25 items related to the eight components of KM and perceptions on firm's reputation. The list of 25 items related to KM consists of a 5-point Likert scale. Respondents must rate their agreements on each statement on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Respondents consist of managing director or equivalent from the legal firms in Johor Bahru. 205 questionnaires were distributed out of which 53 questionnaires were returned and analysed. Principle component factor analysis was performed on the KM instruments to determine its construct validity. Reliability analysis was also conducted to ensure the internal reliability of the said instrument. Correlations were conducted to determine the relationship between KM and the perceptions on firm's reputation.

FINDINGS

The survey instrument was tested for reliability and it yielded a Cronbach's Alpha value of 0.8664. This indicated that the instruments have the necessary reliability for statistical analysis. Cronbach's Alpha was used as it can be considered an adequate index of the inter-item reliability of independent and dependent variables (Sekaran, 1992).

Factor analysis was performed to determine whether the specific items in section two of the instruments that made up each theoretical construct were clustered together. In other words it seeks to confirm the dimensions of the concept that have been operationally defined and indicate the appropriateness of each items for each dimensions.

Based on Table 1, the relatively high value of 0.844 for the Kaiser-Meyer-Olkin Measure of sampling adequacy indicates that the proportion of variance in the variables are caused by underlying factors hence allowing for the application of factor analysis. This is also supported by the Bartlett's test of Spherecity value of 0.00 which is less than 0.05 proving that the analysis is appropriate.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.844
Bartlett's Test of Spherecity	Approx. Chi Square	593.324
	df	231
	Sig.	0.000

The results of the principal component factor analysis, based on VARIMAX rotation using an Eigen value of one or greater as the criterion test, suggests a six-factor solution to KM instrument. However, two of the factors were dropped for further analysis since it does not have the reliability values of 0.7 or greater (Nunnally, 1978). Further examination of the items loading on each factor resulted in the following label being applied to the various factors:

Table 2

Factor 1	Knowledge identification
Factor 2	Knowledge acquisition
Factor 3	Knowledge sharing
Factor 4	Knowledge creation

A summary of the rotated factor analysis variables found in this study is presented in Table 3. Reliability analysis of these three factors shows satisfactory alpha values (more than 0.7).

Table 3

Item	Factor			
	1	**2**	**3**	**4**
The firm dedicates resources to detecting and obtaining external knowledge and communicating it within the organization.	.787			
The firm has some form of database to capture information and experience gained from accomplished projects.	.661			
The firm regularly identifies the type of business information relevant for the firm's usage	.722			
The firm encourages the use of knowledge database to identify and obtain related information in order to improve work process amongst members of the organization.	.632			
The firm acquires and uses knowledge obtained from external sources such as industrial associations, competitors, clients, suppliers, including universities and government organizations.		.795		
The firm improves customer satisfaction by implementing acquired knowledge in terms of public relations.		.826		
The firm regularly updates information which consists of good work practices, lessons learned, expert directory etc.		.649		
The firm updates and evaluates it databases frequently to ensure that they have the latest information.		.615		
The firm facilitates collaborative work by different project teams.			.844	
The firm regularly assigns project team work to improve the current work process.			.696	
The firm encourages mentor-mentee relationships among workers.			.757	
The firm sends employees to seminars, conferences etc. on regular basis to enable them to learn new knowledge and improvise their knowledge to suit the firm's need.				.844
The firm emphasizes on Research and Development (R&D) in an effort to create new knowledge.				.794
Cronbach's alpha	.7893	.7788	.7089	.7956

* only loading having absolute value greater than 0.600 are shown

Results of factor analysis show that there are four reliable dimensions of KM construct. Factor 1 (knowledge identification) refers to the identification of knowledge and know how related to a particular problem. Factor 2 (knowledge acquisition) consists of four items which focuses on the process of acquiring needed knowledge and applying it onto a particular set of problems. It also refers to updating firm's database on a regular basis. Factor 3 (knowledge sharing) offers insight to the sharing of tacit as well as explicit knowledge amongst members of the organization. The fourth factor (knowledge creation) suggests the creation of new knowledge by members of the organization through the amalgamation of member's knowledge and the latest legal information gained via research or experts gathering. Table 4 shows the mean score and standard deviation of each of the four KM construct. Results indicated that respondents tend to be 'moderately agree' on the items related to the KM construct.

Table 4

	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge identification	53	1.00	5.00	3.8774	.7266
Knowledge acquisition	53	1.00	5.00	3.5943	.7583
Knowledge sharing	53	1.00	5.00	3.3208	.9204
Knowledge creation	53	1.00	5.00	3.2736	.9434
Valid N (listwise)	53				

The correlation between the independent variables and dependent variable are shown in Table 5. Variables such as 'knowledge identification', 'knowledge acquisition' and 'knowledge sharing' and firm's reputation are significantly correlated at $p = 0.05$. 'Knowledge creation' is not supported due to insignificant correlation ($p > 0.05$).

Table 5: Correlations

Spearman's rho			Firm's reputation
	Knowledge identification	Correlation Coefficient	.415**
		Sig. (2-tailed)	.002
		N	53
	Knowledge acquisition	Correlation Coefficient	.445**
		Sig. (2-tailed)	.001
		N	53
	Knowledge sharing	Correlation Coefficient	.292*
		Sig. (2-tailed)	.036
		N	53
	Knowledge creation	Correlation Coefficient	.127
		Sig. (2-tailed)	.369
		N	53

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

DISCUSSION AND CONCLUSIONS

Overall, the findings of the study seem to indicate that legal firms in Johor Bahru do implement KM albeit on the moderate scale and it is largely confined on the following area:

1. the identification and detection knowledge needed to the industry.

2. the acquisition and application of acquired knowledge in order to improved client satisfaction.

3. the sharing of acquired knowledge amongst members of the organization.

4. the creation of new knowledge through innovation.

Identification and acquisition of knowledge seems to be the main features of the KM process in the legal industries while the creation of knowledge the least featured. In other words, legal firms put more efforts in determining the type of business information that is relevant for the firm's use and have proper procedure in identifying knowledge according to its importance to the organization. However, firms seldom promote activities related to knowledge creation such as reconfiguring and recombining existing pieces of knowledge along with imitation, substitution and replication strategy.

Knowledge is of less value to the organization if it resides in individuals. Hence, many international firms have made a substantial effort trying to create, transfer and share knowledge within organizations to enhance their profit generation capability (Laurie, 2002). Knowledge sharing is a set of behaviors that involve the exchange of information or assistance to others. It differs from information sharing because it contains an element of reciprocity and is usually requested (Connelly & Kelloway, 2003). Studies have found that knowledge sharing is encouraged by increased social interaction. This could be because people are more likely to share knowledge with their friends and social interaction increases the likelihood of an employee making friends with colleagues (Connelly & Kelloway, 2003). Thus, it is important for the legal firms in Johor Bahru to encourage social interaction amongst its' employees as knowledge sharing fares rather poorly.

The creation of new knowledge is the most popular topic in today's management literature (Binney, 2001). The focus of the business and knowledge creation is on providing an environment in which knowledge workers of various disciplines can come together to create new knowledge. This is because existing know-how and best practices which assumes that all organizations are roughly alike may not be relevant to future aspirations. Employees access and use corporate know-how without reviewing and updating it, or validating it. They do little to replenish the supply of organizational knowledge by supporting processes for creating new knowledge (Coulson-Thomas, 2004). Since legal firms score rather miserably in this area, they should starts identifying individuals who are able to add to the pool of collective understanding and best practice. These creators of new knowledge may not necessarily be the silver-tongued or the best presenters. Sometimes they find themselves the victims of de-layering, headcount reductions and ageism.

Knowledge identification, knowledge acquisition and knowledge sharing were found to have positive but relatively weak correlations with firm's reputation. The weak correlations are expected due to the nature of KM itself and the multifactor influence of organization's reputation. According to Dunford (2000), despite the pervasiveness of the view that KM is a core component of competitiveness, its specific contribution to revenue or firm's image is very difficult to determine. Hence, though it is generally agreed that KM is important to the legal business, some of the firms have not put in enough effort to develop this area.

The emergence of the hyper-competitive global economy and the coming of knowledge age have drove organizations to manage their resources more effectively. Management is increasingly aware that knowledge resources are essential to the development of their organizations. Hence, managers must understand their positions in relation to their competitors as well as their customers' attitudes and perceptions. Knowledge management is valuable because it can be useful for decision making as well as for strategic formulation making it a competitive tool.

REFERENCES

Bharadwaj, S.G., Varadarajan, P.R. & Fahy, J. 1993, 'Sustainable competitive advantage in service industries: a conceptual model and research propositions', *Journal of Marketing*, vol. 57 no. 4, pp. 83-99 in Mazzarol, T. & Soutar, G. N. 1999, 'Sustainable competitive advantage for educational institutions: a suggested model', *The International Journal of Educational Management*, vol. 13, no. 6, pp. 287-300.

Bhatt, G. D. 2001, 'Knowledge management in organizations: examining the interaction between technologies, techniques, and people', *Journal of Knowledge Management*, vol. 5, no. 1, pp. 68-75.

Binney, D. 2001, 'The knowledge management spectrum – understanding the KM landscape', *Journal of Knowledge Management*, vol. 5, no. 1, pp. 33-42.

Bollinger, A. S. & Smith, R. D. 2001, 'Managing organizational knowledge as a strategic asset', *Journal of Knowledge Management*, vol. 5, no. 1, pp. 8-18.

Connelly, C.E. & Kelloway, E. K. 2003, 'Predictors of employees'perceptions of knowledge sharing cultures', *Leadership & Organization Development Journal*, vol. 24, no.5, pp. 294-301.

Chard, A. M. 1997*, Knowledge Management at Ernst & Young, Case S-M-291*, Graduate School of Business, Stanford University in Dunford, R. 2000, 'Key challenges in the search for the effective management of knowledge in management consulting firms', *Journal of Knowledge Management*, vol. 4, no. 4, pp. 295-302.

Civi, E. 2000, 'Knowledge management as a competitive asset: a review', *Marketing Intelligence and Planning*, vol. 18, no. 4, pp. 166-174.

Clarke, T. & Rollo, C. 2001, 'Corporate initiatives in knowledge management', *Education + Training*, vol. 43, no. 4/5, pp. 206-214.

Coulson-Thomas, C. 2004, 'The knowledge entrepreneurship challenge: Moving on from knowledge sharing to knowledge creation and exploitation', *The Learning Organization*, Vol. 11 No. 1, pp. 84-93

Dunford, R. 2000, 'Key challenges in the search for the effective management of knowledge in management consulting firms', *Journal of Knowledge Management*, vol. 4, no. 4, pp. 295-302.

Earl, M. J. 1983, Accounting and Management in Prusak, L. 1997, *Knowledge in Organizations*, Butterworth-Heinemann, Boston.

Gottschalk, P. 1999, 'Knowledge management in the professions: lessons learned from Norwegian law firms', *Journal of Knowledge Management*, vol. 3, no. 3, pp. 203-211.

Hertog, F. den & Huizenga, E. 1997, De kennnisfactor. Concurreren als kennisonderneming, Deventer.

Kwok, S.H. & Gao, S. 2004, 'Knowledge sharing community in P2P network: a study of motivational perspective', *Journal of Knowledge Management*, vol. 8, no.1, pp. 94-102.

Lamb, R. 1999, 'Using intranets: preliminary results from a socio-technical field study', *Proceeding of the 32nd Hawaii International Conference on System Sciences, Maui*, January 5-8, pp. 1-10 in Beijerse, R. P. 1999, 'Questions in knowledge management: defining and conceptualising a phenomenon', *Journal of Knowledge Management*, vol. 3, no. 2, pp. 94-109.

Laurie, D.L. 2002, 'Productivity challenge: gaining through innovation', *Financial Executive*, Vol. 18, No. 7, pp. 30-5.

Liebowitz, J. & Beckman, T. 1998, *What Every Manager School Know*, CRC, Boca Raton, FL in Smitch, E. A. 2001, 'The role of tacit and explicit knowledge in the workplace', *Journal of Knowledge Management*, vol. 5, no. 4, pp. 311-321.

Malhotra, Y. 1998, *Knowledge Management, Knowledge Organizations & Knowledge Workers: A View from the Front Lines* [Online], Available: http://www.brint.com/interview/maeil.htm [2002, June 6].

Nunnally, J.C. (1978), "Psychometric Theory", 2nd Edition, McGraw-Hill, New York, pp. 181-191.

O'Dell, C. & Grayson, C. J. Jr. 1998, 'If Only We Knew What We Know', *The Free Press*, New York in Smith, E. A. 2001, 'The role of tacit and explicit knowledge in the workplace', *Journal of Knowledge Management*, vol. 5, no. 4, pp. 311-321.

Osbaldeston, M. & Barham, K. 1992, 'Using management development for competitive advantage", *Long Range Planning*, vol. 25, no. 6, December, pp. 18-24 in Mazzarol, T. & Soutar, G. N. 1999, 'Sustainable competitive advantage for educational institutions: a suggested model', *The International Journal of Educational Management*, vol. 13, no. 6, pp. 287-300.

Pasternack, B. A. & Viscio, 1998, *The Centerless Corporation: A new Model for Transforming Your Organization for Growth and Prosperity*, Simon & Schuster, New York in Dunford, R. 2000, 'Key challenges in the search for the effective management of knowledge in management consulting firms', *Journal of Knowledge Management*, vol. 4, no. 4, pp. 295-302.

Preiss, K. 1999, 'Modeling of knowledge flows and their impact', *Journal of Knowledge Management*, vol. 3, no. 1, pp. 36-46.

Sekaran, V. 1992, 'Research Methodoloty for Business', 2nd Edition, New York, Wiley, pp. 246-247.

Smith, E. A. 2001, 'The role of tacit and explicit knowledge in the workplace', *Journal of Knowledge Management*, vol. 5, no. 4, pp. 311-321.

Swiercz, P.M. & Spencer, B.A. 1992, 'HRM and sustainable competitive advantage: lessons from Delta Air Lines', *Human Resource Planning*, vol. 15, no. 2, pp. 35-46 in Mazzarol, T. & Soutar, G. N. 1999, 'Sustainable competitive advantage for educational institutions: a suggested model', *The International Journal of Educational Management*, vol. 13, no. 6, pp. 287-300.

Weggeman, M.C.D.P. 1997, *Kennismanagement, Inrichting en besturing van kennisintensieve organisaties*, Schiedam in Beijerse, R. P. 1999, 'Questions in knowledge management: defining and conceptualising a phenomenon', *Journal* of *Knowledge Management*, vol. 3, no. 2, pp. 94-109.

Weiers, R. M. 1988, *Marketing Research*, 2nd edn, Englewood Cliffs, Prentice-Hall, New Jersey.

Wiig, K. M. 1997, 'Knowledge management: an introduction and perspective', *The Journal of Knowledge Management*, vol. 1, no. 1, pp. 6-14.

Winter, S.G. 1987, 'Knowledge and competence as strategic assets' in Mazzarol, T. & Soutar, G. N. 1999, 'Sustainable competitive advantage for educational institutions: a suggested model', *The International Journal of Educational Management*, vol. 13, no. 6, pp. 287-300.

Information Systems Success: An Investigation on the Impact of Organisational Structure and Culture. A Case Study on Citibank, Brunei

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ABSTRACT

Recent research on Information Systems (IS) Success has adapted the Contingency Theory in assessing the "success" of information system. This study focuses on further theoretical and empirical development of this important belief in IS Success. Specifically, unlike prior research which has re-specified the IS model, this research will instead study the impact of some independent variables on the model itself. Some elements of Organisational Structure and Organisational Culture have been proposed to have an impact on the IS Success model and has been theoretically justified. Based on the conceptual definition of the selected elements of the Organisational Structure, Organisational Culture and IS Success, this study develops operational measures of them. The model is tested on 31 users of Citibank Information System. Partial Least Square (PLS) technique was used to estimate the parameters of the proposed model. The study findings indicate that neither one factor under organisation structure nor one factor under culture has significant impacts on Information Systems success. Implications of the results are highlighted.

INTRODUCTION

Empirical research into the successful development of information systems has been filled with difficulties (Garrity and Sanders, 1998). The role of Information Technology continues to expand in scope and complexity and as such IS researchers and professionals are facing problems in defining the theories and criteria for judging information system success. Despite all the previous work related to system success, inconclusive findings in empirical studies of information systems development might be due to the inadequate dependent measures of IS success.

Previous studies have formulated six dependent variables (that is: System Quality, Information Quality, Use, User Satisfaction, Individual Impact and Organisational Impact) that could contribute to the success of an organisation's Information Systems (DeLone and McLean, 1992). The availability of other variables that could contribute to the overall Information Systems Success has also been considered. Based upon these foundations, this study has augmented Information Systems Success Model with two new independent variables. These variables, Organisational Structure and Organisational Culture, were quantified and tested against the dependent variables of Information Systems Success.

Recognising the limited perspective of the original Information Systems Success Model, it is therefore, the core theme of this research to contribute to the literature, by "confirming" to a certain extent the conceptual development and refinement of the dependent measures. The knowledge acquired from this research would also seek to confirm the importance of Organisational Structure and Organisational Culture as two of the independent variables in the Information System Success Model.

The analysis uses a structural equation modelling approach with partial least squares (PLS). PLS, a second-generation multivariate analysis technique, embraces abstract and empirical variables simultaneously, and recognises the interplay of these two dimensions of theory development (Igbaria et al, 1995).

The reminder of this paper is organised as follows. The next section provides a brief but critical review of the literature. The subsequent section presents the research model and hypotheses. Details of the empirical study

and the statistical analyses are then presented. The final section summarises the application and highlight important findings.

CONCEPTUAL BACKGROUND

Information Systems Success

The Information Systems Success Model proposed by DeLone and McLean (1992) is based on the work of Shannon and Weaver (1984) and Mason (1984), and other published papers which address the issues of IS success (Figure 1). Though there is not one success measure, DeLone et al confirmed that these measures fall into six major categories. These categories are interrelated and interdependent, forming an IS Success model. SYSTEM QUALITY and INFORMATION QUALITY singularly and jointly affect both USE and USER SATISFACTION. Additionally, the amount of USE can affect the degree of USER SATISFACTION – positively or negatively – as well as the reverse being true. USE and USER SATISFACTION are direct antecedents of INDIVIDUAL IMPACT; and lastly, this INDIVIDUAL IMPACT on performance should eventually have some ORGANISATIONAL IMPACT (DeLone and McLean, 1992, pp.83-87).

This model has since been used as a basis for empirical research, and has been refined and extended by a number of researchers (such as Fiedler et al, 1996; Seddon et al, 1994; Pitt et al, 1995; Ballantine et al, 1998; Garrity et al, 1998; Saunder et al, 1992; Myers et al, 1998).

Motivated by DeLone et al's call for further development and validation of their model, Seddon and Kiew (1994) critically examined the meaning of the four of the taxonomy in the IS Success Model. They suggested that user involvement is a fundamental factor that should be present. Their empirical results provided substantial support for DeLone and McLean's model. Pitt, Watson and Kavan (1995) have produced an augmented model which includes the appropriateness of SERVQUAL to assess IS service quality. Recognising the expanding function of the IS department, their major contribution to the study demonstrates that SERVQUAL, an extensively applied marketing instrument for measuring service quality, is applicable in the IS arena.

Over the years, the Contingency Theory of Information Systems continues to evolve. Adapting from Saunders and Jones (1992), the contingency theory for IS assessment would use selected measures for each assessment dimension and selected organisational and external environmental variables. The most recent research by Myers et al (1998) examined the need for the IS assessment and suggested a comprehensive IS assessment framework linked to organisational performance using existing IS assessment theory as a base and incorporating measurement concepts from other disciplines. The existing models of IS success are updated to include the emerging IS success dimensions of service quality and work group impact and provide a comprehensive method for organising the various measures of IS success (Figure 2). This theoretically-based, comprehensive set of IS assessment measures and a contingency theory for selecting appropriate measures will hopefully provide IS managers with the guidance necessary to develop their own IS assessment systems. These assessment systems have the potential to furnish the feedback required to enhance the quality and productivity of the IS function and hence the organisation.

The notion of culture and structure has been used as possible dimension to effective IS management. Meyer (1996) talks about culture and structure (in addition to internal economy, methods and metrics) as two of the five dimensions of an organisation design which an effective management should call for in order to be competitive in this changing economic condition. Ishman (1998) proposes a questionnaire to be added to the inventory of well-developed management information system instruments. Tested on cross-cultural environments, this research confirmed that the factors that have influenced successful outcomes at the individual level in a domestic environment are applicable in a global environment (Ishman, 1998).
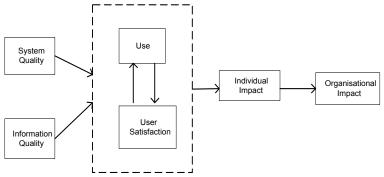
Figure 1: The Original IS Success Model (DeLone and McLean, 1992)

To conclude, the above brief literature review has supported the idea that Information Systems Success would be affected by other variables especially presented in the IS Assessment Selection Model by Myers et al (1998). However, sensing the gap that no research had actually been done to test the impact of some of these variables on IS success, this study has selected two of the variables from the Contingency Theory Variables, that is, Organisational Structure and Organisation Culture as two of the independent variables in the Information System Success Model. It is also the main aim of this study to find new directions to investigate the importance of other independent measures of Information Systems Success, for future research.

Organisational Structure

The evolution of structural designs throughout the century has seen organisations grew from the original simple structure, to becoming bureaucracies, and the rise of modern large corporations. Organisation Structure is the organisation's system of task, reporting, and authority relationships within which the organisation does its work – ie. how jobs are formally divided, grouped, and coordinated. Due to the differences in strategies and environmental circumstances, Organisation Structure would undoubtedly differ from one another.

Figure 2: A Comprehensive IS Assessment and Contingency Theory (Selecting the Measures) – Myers et al, 1998

Organisational Structure can in turn be "measured" by the structural variables like (Robbins, 1998): Work Specialisation- the degree to which tasks in the organisation are subdivided into separate jobs; Departmentalisation - the manner by which divided tasks are combined and allocated to work groups; Chain of Command - the unbroken line of authority that extends from the top of the organisation to the lowest echelon and clarifies who reports to whom; Span of Control - the number of subordinates a manager can efficiently and effectively direct; Formalisation – the degree to which jobs within the organisation are standardised; Centralisation and Decentralisation - Centralisation is the degree to which decision-making is concentrated at a single point in the organisation and Decentralisation is the decision discretion that is being pushed down to lower-level employees.

There has also been vast research done in relation to Organisation Structure and Information Systems, and hence the overall business strategy, such as Pankratz (1991) who studied impact of information technology (IT) on business management in the 1990s. Carlson et al (1999) did a study on Organisational Impacts of New Communication Technology. His research studied whether cellular phones have an effect on decision-making in the organisation, and tested which of the variables described by Huber (1990) might be influential in any changes in decision making (these four independent variables are: centralisation-decentralisation, levels of management, standardisation, and formalisation). Hofstede et al (1990) did a comprehensive study in Denmark and the Netherlands and touched on the relation between culture and other organisational characteristics. They measured structure in terms of span of control, percentage of supervisory personnel, centralisation score, specialisation score and formalisation score. Hult et al (1997) measured part of structure in terms of Centralisation and Formalisation.

To date most of the literature only touched on the impact of Information Systems (or Technology) on the design of an Organisation Structure but rarely the other way. Sensing this gap, it is hoped that this research could contribute to the literature that there is also an impact of Organisation Structure on Information Systems development and success.

Organisational Culture

An organisation's current customs, traditions, and the general way of doing things are largely due to what it has done before and the degree of success it has had with those endeavours (Robbins, 1998). This could be traced back to the ultimate source of an organisation's culture: its founders. The founders traditionally have a major impact on the original culture of an organisation. They have a vision of what the organisation should be. Once a culture is in place, practices within the organisation act to maintain it by giving employees a set of similar experiences. Many of the human resource practices such as the selection process, performance evaluation criteria, reward practices, training and career development activities, and promotion procedures ensure that those hired fit in with the culture, reward those who support it, and penalise those who challenge it.

Organisational Culture therefore refers to *a system of shared meaning or common perception held by the members that distinguishes the organisation from other organisations* (Robbins, 1998). This system of shared meaning is actually a set of seven key characteristics that the organisation values: Innovation and Risk Taking – the degree to which employees are encouraged to be innovative and take risks; Attention to Detail – the degree to which employees are expected to exhibit precision, analysis, and attention to detail; Outcome Orientation – the degree to which management focuses on results or outcomes rather than on the techniques and processes used to achieve these outcomes; People Orientation – the degree to which management decisions take into consideration the effect of outcomes on people within the organisation; Team Orientation – the degree to which work activities are organised around teams rather than individuals; Aggressiveness – the degree to which people are aggressive and competitive rather than easygoing; Stability – the degree to which organisational activities emphasise maintaining the status quo in contrast to growth. Each of these characteristics exists on a continuum from low to high. Appraising the organisation on these seven characteristics would give a composite picture of the organisation's culture (Robbins, 1998).

There has also been vast research done in relation to the importance of Organisation Culture and Information Systems, and hence the overall business strategy. Robson (1994) noted the complex cultural web of an organisation that needs to be analysed. This is because the organisational culture is the element that ensures that, faced with the same set of circumstances in the environment and internal resource constraints, organisations respond in different ways. The culture of the organisation defines their measures of success, or recipe. This recipe can have a dampening effect upon the influence of environmental factors and hence upon strategy.

Malone (1994) noted that it is impossible to underestimate the impact of human emotions on the success or failure of technology in the workplace. Hasan et al (1999) conducted a study on the relationship between culture and the adoption of IT in two different developing regions. One of the three major issues they found was that: the success of information systems in organisations is dependent on the activities of people who carry with them a pattern of thinking, feeling and acting which is learnt through their culture. They then concluded that in order to make most effective use of IT, people should choose a product that supports the work practises determined by their own culture.

To date most of the literature only touched on the impact of Information Systems (or Technology) on Organisation Culture but rarely the other way. Sensing this gap, it is hoped that this research could contribute to the literature that there is also an impact of Organisation Culture on Information Systems Success.

RESEARCH MODEL AND HYPOTHESES

Figure 3 presents the proposed impact of organisation structure and culture on Information Systems Success. The relationship between Information Quality, System Quality, Service Quality, Use, User Satisfaction, Individual Impact, Work Group Impact and Organisational Impact derive directly from the revised model of IS Success by Myers et al (1998). In their paper Myers et al (1998) examined the need for IS assessment and suggested a comprehensive IS assessment framework linked to organisational performance using the existing IS assessment theory as a base and incorporating measurement concepts from other discipline. They presented a theoretically-based, comprehensive set of IS assessment measures and a contingency theory for selecting appropriate measures that would provide IS managers with guidance necessary to develop their own IS assessment systems. They believed that these assessment systems would have the potential to furnish the feedback required to enhance the quality and productivity of the IS function and hence the organisation.
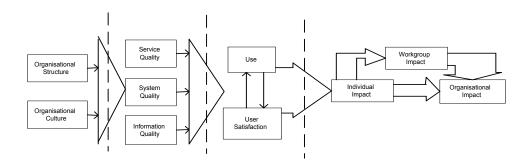
Figure 3: The Impact of Organisational Structure and Organisation Culture on Information Systems Success

Parallel with the work of Myers et al (1998), this research will "extend" the IS Success to include some elements of Organisation Structure and Organisation Culture as these elements are some of the "Organisational Environment" (Myers, 1998) which are believed to have impacts on IS Success.

The model proposed that organisational structure and organisational culture act as the independent variables (them being representative of the contextual and environmental characteristics of Shore (1998)). We retained the IS Success model as it is. Thus the independent variables theoretically impact the first three elements of the IS model that is, Service Quality, System Quality and Information Quality. It is noted that "Decentralisation", "Formalisation", and "Work Specialization" are used as proxy for organizational structure. On the other hand, "Innovation/Risk Taking", "People Orientation", and "Stability" are used as proxy for organizational culture.

The structural equation modelling (SEM) approach is used to test various hypotheses. Figure 4 shows the full blown IS success model in our study. This model is divided into two parts: the organisational structure and culture being one aspect of the measurement (Confirmatory Factor Analysis (CFA)) model and the other being the information system success thus forming a complete CFA Model.

Fourteen constructs, each with its unique composite variables, form the confirmatory "structural" model, with relationships specified in accordance with the proposed theory that Organisation Structure and Culture impact the Information Systems Success.

Based on the proposed model and extensive literature review, the following hypotheses are proposed:

Organisational Structure:
H1: Decentralisation has positive impact on Information Quality
H2: Decentralisation has positive impact on System Quality
H3: Decentralisation has positive impact on Service Quality
H4: High Formalisation has negative impact on Information Quality
H5: High Formalisation has negative impact on System Quality
H6: High Formalisation has negative impact on Service Quality
H7: Work Specialisation has positive impact on Information Quality
H8: Work Specialisation has positive impact on System Quality
H9: Work Specialisation has positive impact on Service Quality

Organisational Culture:

        H10: Innovation/Risk Taking has positive impact on System Quality
        H11: People Orientation has positive impact on Information Quality
        H12: People Orientation has positive impact on System Quality
        H13: People Orientation has positive impact on Service Quality
        H14: Stability has positive impact on Information Quality
        H15: Stability has positive impact on System Quality
        H16: Stability has positive impact on Service Quality

Other hypothesised links of Figure 4 are similar to the previous studies on IS Model (DeLone et al, 1992, Myers et al, 1998, Pitt et al, 1995, Seddon et al, 1994)

RESEARCH METHODOLOGY

Sample and Procedure

Data were collected using a questionnaire based survey. The survey was distributed to the staff of Citibank NA, Brunei. The bank was chosen as it acts as a representative of a financial institution in this research.

What Citibank NA Brunei practises now is the Bank-in-a-box application. This means that the Information Systems are integrated and the most commonly use systems are: COSMOS which is a Back-end system that handles book records on deposits and loans; CR Management System which is another Back-end system; CITIBANKING which is the Front-end system that faces customers; CATZ which is another Front-end system that deals with ATMs and directly handles customers; Middle Office System that helps with the workflow; SMART which is a report archiver and is online; WEB-based applications; E-mail; and special requirement for each department such as CORONA that consolidates accounts with other Citibank branches.

In Brunei Citibank NA has only two offices: one in Bandar Seri Begawan and the other at Kuala Belait, with a total number of 54 employees.The questionnaires were distributed through three managers of the bank. All respondents were guaranteed confidentiality of individual responses, and a response rate of 57.4% was obtained. Most of the surveys were obtained from staff between the age range of 25-34, with 61.3 percent of them being females. 35.5 percent have GCE O Levels or below qualification with 10-19 years of working experiences at the bank.

ANALYSES AND RESULTS

To test the research hypotheses, partial least squares (PLS) analysis was used. PLS is a second-generation multivariate analysis technique used to estimate the parameters of causal models (Igbaria, 1995). PLS embraces abstract and empirical variables simultaneously, and recognises the interplay of these two dimensions of theory development. These second generation techniques are superior to traditional regression and factor analysis because the items measuring a construct are assessed within the context of the theoretical model. The PLS technique is particularly applicable in research area where theory is not as well developed as that demanded by LISREL (Fornell et al, 1982). In addition to that, PLS does not depend on having multivariate normally distributed data, and most importantly PLS can be used with small samples. The computer program used for this analysis was PLSGraphv3.0 (Chin, 2001).

Although the parameters are estimated together, a PLS model is analysed and interpreted in two stages: (1) the assessment of the reliability and validity of the measurement model, and (2) the assessment of the structural model.

With PLS, a causal model such as Figure 4, would be recognised as having two components: the measurement model and the structural model. Relationships or paths among theoretical constructs are described fully in the model. Each construct in turn would have links with a set of items. The measurement model would therefore consist of the relationships between the observed variables (items) and the construct they measure. This model would also evaluate the extent to which the operationalisation of a construct actually measures what it is supposed to measure – ie. construct validity. Two important dimensions of construct validity are (1) convergent validity, and (2) discriminant validity.

Measurement Model

Testing the measurement model includes the estimation of the reliability coefficients of the measures, and also an examination of the convergent and discriminant validity of the research instrument. To determine the appropriate minimum loadings required for the inclusion of an item within a scale, this study used the guidelines recommended by Hair et al (1992) in Igbaria et al (1995), that is, loadings greater than 0.30 are considered significant; loadings greater than 0.40 are considered more important; and loadings 0.50 or greater are considered to be very significant. Nunnally's (1978) guideline for assessing reliability coefficient was used for evaluating composite reliability of each scale. And to assess the average variance extracted (AVE) for all constructs, the guideline of Fornell and Lacker's (1980) and Igbaria et al (1995) was used where AVE should be more than 0.5.

Reliability coefficients of the latent variables vary from 0.655 to 0.953, which satisfies Nunnally's guideline. It is noted that "Stability" includes three items instead of four. One item was eliminated after the first PLS run because its factor loading was lower than 0.4. Two items from "Use" have also been eliminated due to the low item loadings. The low values suggest that further research is required to refine the measurement of theses constructs and improve convergence (Rivard and Huff, 1988).

Correlations of constructs

In order to assess the discriminant validity of the measures, this study examined the correlations between the constructs. The measure is said to have adequate discriminat validity, if the items comprising an instrument that measures a construct correlate more highly with each other than with items measuring other constructs in the model. The assessment of discriminant validity of this study does not reveal any serious problems.

Loading and Cross-Loading of Measures

The primary criterion for discriminant validity is that each indicator must load more highly on its associated construct than on any other construct. The factor pattern matrix (from PLS software) was constructed which showed the loadings of each item on all constructs. To save space this table is not presented here. The results of cross-loadings are satisfactory and therefore discriminant validity is maintained.

Structural Model

The structural model is also tested by PLS. With its roots in path analysis, the structural model is analyzed using a regression-based technique that consists of the unobservable constructs and the theoretical relationships among them (paths). The hypotheses to be tested are also represented by the significance of this model. Both the structural and measurement models form a network of constructs and measures. The strength of the measures is indicated by the item weights and loadings whilst the strength and sign of the theoretical relationships is indicated by the estimated path coefficients. Figure 5 shows the path coefficients generated from PLS analysis.

Jackknifing was used to calculate the statistical significance levels for these coefficients. As this is a non-parametric technique, it does not require the usual assumptions of normality associated with regression models.
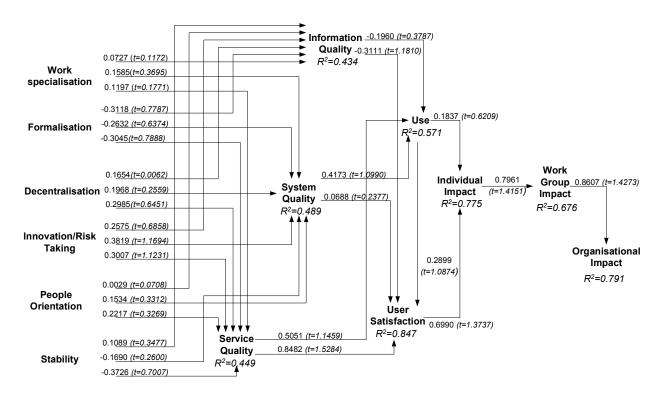
Figure 5: Structural Model for Citibank

Figure 5 shows that the exogenous variables explained 43.4 percent of the variation in Information Quality, 48.9 percent in System Quality and 44.9 percent in Service Quality. Table 1 presents a summary of the hypotheses and findings. The table shows that neither one factor on Organisation Structure nor one factor from Organisation Culture was supported.

CONCLUSION

The primary objective of this study was to investigate the use of a structural equation model to investigate the impact of organisation structure and culture on Information Systems Success. To test the research hypotheses, partial least squares (PLS) analysis was used. Although the parameters are estimated together, the model was analysed and interpreted in two stages: (1) the assessment of the reliability and validity of the measurement model, and (2) the assessment of the structural model. Overall, there were partial support found for the structural model tested in this study. Neither one hypothesis for Organisation Structure nor one factor supported the hypothesis on Organisation Culture. The results were discussed in the context of Citibank which unearthed some important discoveries, primarily in the context of Citibank culture.

Figure 4: Hypothesised Full Structural Equation Model
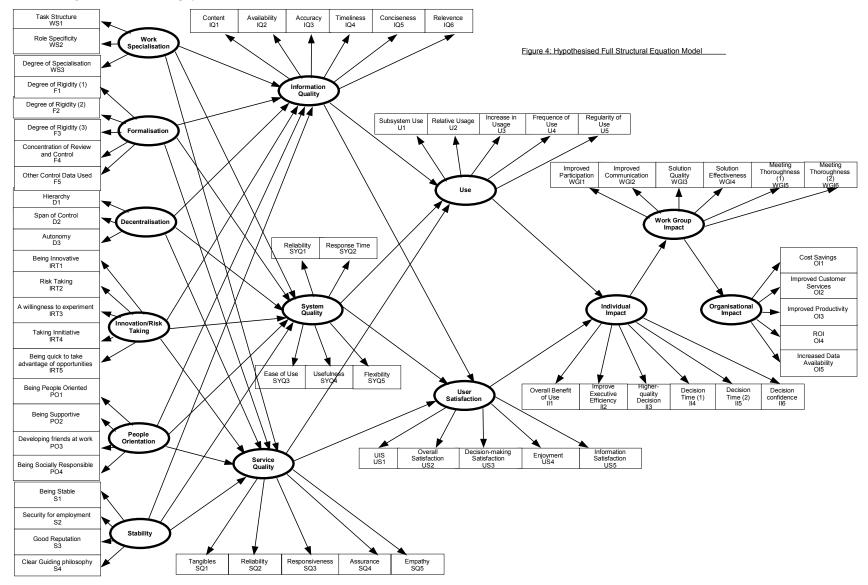
Table 1: Summary of Hypotheses and Findings

Hypotheses	Results
Organisation Structure:	
H1: Decentralisation has positive impact on Information Quality	Not Supported
H2: Decentralisation has positive impact on System Quality	Not Supported
H3: Decentralisation has positive impact on Service Quality	Not Supported
H4: High Formalisation has negative impact on Information Quality	Not Supported
H5: High Formalisation has negative impact on System Quality	Not Supported
H6: High Formalisation has negative impact on Service Quality	Not Supported
H7: Work Specialisation has positive impact on Information Quality	Not Supported
H8: Work Specialisation has positive impact on System Quality	Not Supported
H9: Work Specialisation has positive impact on Service Quality	Not Supported
Organisation Culture:	
H10: Innovation/Risk Taking has positive impact on System Quality	Not Supported
H11: People Orientation has positive impact on Information Quality	Not Supported
H12: People Orientation has positive impact on System Quality	Not Supported
H13: People Orientation has positive impact on Service Quality	Not Supported
H14: Stability has positive impact on Information Quality	Not Supported
H15: Stability has positive impact on System Quality	Not Supported
H16: Stability has positive impact on Service Quality	Not Supported

REFERENCES

Barclay, D., Thompson, R. and Higgins, C. (1995), The Partial Least Squares (PLS) Approach to Causal Modelling: Personal Computer Adoption and Use as an Illustration, *Technology Studies*, Vol 2, No 2, pp. 285-324.

Brislin, R W (1976), Comparative Research Methodology: Cross-Cultural Studies, *International Journal of Psychology*, Vol 11, No 3, pp 215-229.

Bryne, B.M. (1994), *Structural Equation Modelling with EQS and EQS/Windows*, SAGE Publications

Burn, J.M. (1995), The new cultural revolution: The impact of EDI on Asia, *Journal of Global Information Management*, Fall, Vol 3, No 4, pp.16-23.

Carlson, P., Kahn, B.K, and Rowe, F. (1999), Organisational Impacts of New Communication Technology: A Comparison of Cellular Phone Adoption in France and the United Stated, *Journal of Global Information Management*, Vol 7, No 3, pp. 19-29.

Chatman, J. and Jehn, K.A. (1994), Assessing the Relationship Between Industry Characteristics and Organisational Culture: How Different Can You Be?, *Academy of Management Journal*, Vol 37, No 3, pp.522-553.

Chin, W.W. (1998), Issues and Opinion on Structural Equation Modelling, *MIS Quarterly*, Mac 98

Chin, W.W. (2001), PLS-Graph User's Guide, Version 3.0, *Soft Modelling Inc*.

Citibank NA Annual Report 2001

Daft, R.L. (1998), *Essentials of Organisational Theory and Design*, South-Western College Publishing

Davenport, T.H. (1997), *Information Ecology*, Oxford University Press.

DeLone, W. (1988) Determinants of Success for Computer Usage in Small Business, *MIS Quarterly*, March, pp.50-61.

DeLone, W.H. and McLean, E.R. (1992), Information Systems Success: The Quest for the Dependent Variable, *Information Systems Research*, March, v3n1, pp.60-95

Edstrom, A. 1977, User influence and the success of MIS projects: A contingency approach, Human Relations, v30, pp. 595-607

Franz, C.R. et al. 1986, Organisational Context, User Involvement, and the usefulness of Information Systems, Decision Sciences, Summer 1986

Garrity, E.J. and Sanders, G.L. (1998), Introduction to Information systems Success Measurement, in Garrity, E.J. and Sanders, G.L (Eds), *Information Systems Success Measurement*, pp. 1 – 11, Idea Group Publishing..

Griffin (1996), *Management*, Houghton Mifflin Company

Hasan, H and Ditsa, G. (1999), The Impact of Culture on the Adoption of IT: An Interpretive Study, *Journal of Global Information Management*, Vol 7, No 1, and pp.5-15.

Hofstede, G., Neuijen, B., Ohayv, D. and sanders, G. (1990), Measuring Organisational Cultures: A Qualitative and Quantitative Study Across Twenty Cases, *Administrative Science Quarterly*, Vol 35, pp.286-316.

Hoyle, R.H. 1995, *Structural Equation Modelling: Concepts, Issues and Applications*, Sage Publications Inc.

http://theweb.badm.sc.edu/grover/ISWorld/isoehom3.htm

Igbaria, M., Guimares, T., and Davis, G.B. (1995), Testing the Determinants of Microcomputer Usage via a Structural Equation Model, *Journal of Management information Systems*, *Vol* 11, No 4, pp. 87-114.

Katz, J.P. and Townsend, J.B. (2000), The Role of Information Technology in the "fit" between Culture, Business Strategy and Organisational Structure of Global Firms, *Journal of Global Information Management*, Vol 8, No 2, pp.24-35.

Kettinger, W., Lee, C. and Lee, S. (1995), Global measures of information service quality: A cross-national study, *Decision Sciences*, Vol 26, No 5, pp569-588.

Lucas, H.C. Jr. 1976, Empirical evidence for a descriptive model of implementation, MIS Quarterly, v2n2, pp. 27-42

Malone, R. (1994), Wireless Communications with a Human Face, *Communications News*, Vol 31, No 5, pp.36.

Myers, B.L, Kappelman, L.A. and Prybutok, V.R. (1998), A Comprehensive Model for Assessing the Quality and Productivity of the Information Systems Function: Toward a Theory for Information Systems Assessment, in Garrity, E.J. and Sanders, G.L. (Eds), *Information Systems Success Measurement* (pp.94 – 121), Idea Group Publishing.

Myers, B.L. Kappelman, L.A. and Prybutok, V.R. (1997), A Comprehensive Model for Assessing the Quality and Productivity of the Information Systems Function: Toward a Contingency Theory for Information Systems Assessment, *Information Resources Management.*

O'Reilly, C.A., Chatman, J. and Caldwell, D.F. (1991), People and Organisational Culture: A Profile Comparison Approach to Assessing Person-Organisation Fit, *Academy of Management Journal*, Vol 34, No 3, pp.481-516.

Pankratz, H. (1991), Strategic Alignment: Managing for Synergy*, Ivey Business Quarterly*, Winter, Vol 55, No 3, and pp.66-71.

Pitt, L.F., Watson, R.T. and Kavan, C.B. (1995), Service Quality: A measure of Information Systems Effectiveness, *MIS Quarterly*, Vol 19, No 12, pp.173-187.

Pitt, L.F., Watson, R.T. and Kavan, C.B. (1997), Measuring Information Systems Service Quality: Concerns for a complete canvas, *MIS Quarterly*, Vol 21, No 2, pp.209-221.

Revenaugh, D.L. (1994), Implementing Major Organisational Change – Can we really do, *TQM Magazine*, Vol 6, No 6, pp.38-48.

Robbins, S.P. (1998), *Organisational Behaviour*, Prentice-Hall: United States of America, 8th Edition (International).

Robey, D. (1991), *Designing Organisations*, Irwin Inc., Third Edition.

Robson, W. (1994), *Strategic Management and Information Systems - An Integrated Approach*, Pitman Publishing

Saunders, C.S., and Jones, J.W. (1992), Measuring Performance of the information systems function, *Journal of Management Information Systems*, Vol 8, No 4, pp.63-82.

Seddon, P. (1994), A *Re-Specification of DeLone and McLean's Model of IS Success*, Department of Accounting and Finance, Melbourne University, 14 June.

Seddon, P. and Kiew, M.Y. (1994), A Partial Test and Development of DeLone and McLean's Model of IS Success, 10 June, *ICIS Proceedings.*

The Information and Communication Technology Management Framework for Facilities Management Business in Malaysia

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ABSTRACT

Information and Communication Technology (ICT) become more important nowadays. The Malaysia government has also define attractive policies to make our economy environment more attractive such as Multimedia Super Corridor which is emphasize the implementation of ICT in various economy sector and also to make ICT as an important agenda. This includes facilities management sector in Malaysia. Therefore, this research will be planned to build a national ICT Management Framework for facilities management sector in Malaysia. This framework is a strategy and synergistic combination of a number of key components, working in tandem. The framework is best viewed as an interconnected triangle consisting of three key elements, namely, people, infrastructure and applications. The ICT Management framework must identify the importance to innovation of building strong link between ICT and facilities management sector. These will enhance facilities management sector capability to produce and deliver globally competitive product and services, to facilitate growth.

INTRODUCTION

As the use of computers and telecommunications have changed over time, the portfolios of information systems suitable to an era of inward-focus automation of basic activities are unlikely to be suited to an age which focuses on information to support executive decision making, connect the organization to another organizations in the business environment. According to Konsynski and Tapscott, ICT is a factor in contemporary business environment to growth and as agent to link between two or more organizations with distinct and probably different structures, strategies, business process and organizational cultures.

The companies must take part and alert with new ICT system because to enter in globalization business, all the management system must be up date and all staff in the companies should know about ICT very well especially for the management.

All the companies in Malaysia must take action to build their company ICT system and there must have a good ICT framework. Framework is very important because framework is a collaborative community based effort in which these commonly needed data themes are developed, maintained, and integrated by organizations. Companies see the framework as a way to share resources, improve communications, and increase efficiency. Framework is best viewed as an interconnected triangle consisting of three key elements, namely people, infrastructure and applications.

Many types of organizations participate in developing and use the framework for their management. Although different organizations have characteristics data use pattern, all organizations need different resolutions of data at different times, particularly when they are working together. The framework represents a nationwide community for data sharing, and provides the benefits for the companies as a guideline to involve in globalization market.
Developing the ICT framework take a long time but, it is very important especially for facilities management in the companies. In Malaysia, facilities management still a relatively new concept, which makes it difficult to present a definitive description. Facilities management can be described as multifarious because of the diversity of its core component such as technical, financial, administrative and management skill.

The scopes of facilities management will depend mostly on the company of which it is a part. Some companies may consider that the facilities management department should manage all non-core activities. This could therefore

include departments such as purchasing, accounts, legal, and travel. Other companies may have their facilities management department incorporated into another support service function, such as finance or personnel.

Nowadays, facilities management has become a profession. Quite different from the role taken on by the engineer in the early eighties which was described by Becker "Facilities management resided in the boiler room not the boardroom" (Becker, 1990). Facilities management is important and the companies should take serious with facilities department.

The companies can manage their facilities management very well if they have a good system. For this situation, a framework is important to clearly for organize their company as a guideline and basic step to make any changes their process management to enter in era globalization.

MATERIALS

Information System Planning In The Modern Context

By the mid 1990's, it was arguably reasonably reasonably well established that some sort of formalized strategy information system planning was an appropriate undertaking for most organizations. Information system planning is to be closely allied to the organizations business planning activity, the accept wisdom at the time suggesting that ICT should only be attempt once a business strategy have been develop and articulate, and hence understanding reach of direction the organization planning to follow for the next few year, its goal, objectives, core business processes and its changes agenda, for examples. With this business strategy establish and share understanding reach among executives, an information system plan could be develop, determining the information and information system needs to support the business strategy, and thus guiding investment decision into the future.

An interactive and generative process is envisaged, recognizing a general trend of establishing a business strategy, then an information system strategy, and finally information technology, but acknowledging the constraints and pressures in the real world which may act to limit the strategies somewhat. Given the rate of technology change, and the potential and impact that modern ICT could have directly on business strategy, and the outset o this process it is important to be aware of technological advances that may impact or alter the chosen or desire course for an organization (Peppard,1993;Liedtka,1998). The examples for the strategy framework it shows at Figure 1.
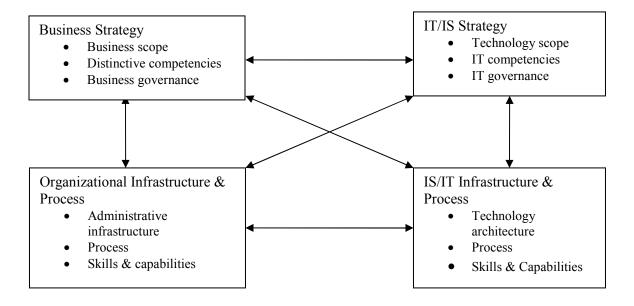
Figure 1 : Achieving Strategic Alignment (Adapted from Henderson and Venkatraman, 1994)

Rationale For Facilities Management

Most buildings represent substantial investments for organizations and usually have to accommodate and support a range of activities, taking into account competing needs. Within those activities is the organization core business, for which an appropriate environment must be created in buildings that may not have been designed for the purposes on organization might be on its core business, it cannot lose sight of the supporting services-the non-core business.

Company may have already considered the distinction between their core business and non-core business (such as cleaning and security) as part of the drive to deliver customer satisfaction and achieve better value for money. Since running costs account for a significant part of annual expenditure, there is bound to be pressure to look for savings in non-core business areas. Cutting operating budgets may be a financial expedient, but may not foster the company's long term development. Since the running of a company involve complex, co-ordinate process and activities, it is necessary to take an integrated view. A piecemeal approach to cutting costs in unlikely to produce the require savings and may impair the company's ability to deliver high-quality services.

Facilities management can therefore be summarized as creating an environment that is conductive to carrying out the company's primary operations, taking an integrate view of the services infrastructure, and using this to deliver customer satisfaction and value for money through support for and enhancement of the core business. Facilities management also can describe as something that will sweat the assets, that is make them highly cost effective, enhance the company's culture and image, enable future change in the use of space, deliver effective and responsive services, and provide competitive advantage to the company's core business. Relationship between core and non-core business in company shows at Figure 2.
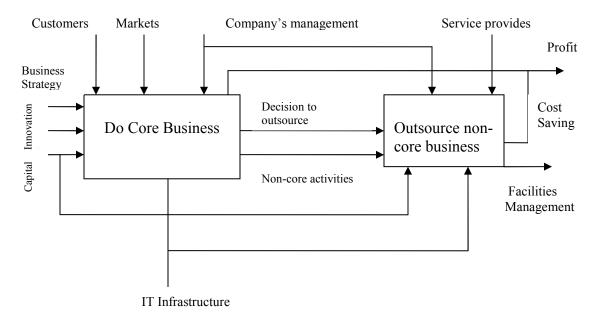
Figure 2: Basic Relationship Between Core And Non-Core Business

Company may not be aware of the extent to which value for money in facilities management can be improved. There are common themes and approaches to facilities management, regardless of the size and location of buildings, although these may not necessarily result in common solutions to problems. In some cases, estate-related and facilities services outsourced (contracted out) and in others retained in house for good reasons in each case. There are also many companies that operate what might be described as a mixed sourced in some measure as well as being retained in house.

Whichever course of action has been taken, the primary concern is the basis for the decision. Where the companies approach has been arrived at for entirely proper reasons, such as demonstrating better value for money from one approach as opposed to the other, facilities management is working effectively.

THE DEVELOPMENT OF ICT IN FACILITIES MANAGEMENT

The use of information technologies without the overarching direction of and information system, more often than not, leads to generation of voluminous, poorly focused and irrelevant information. The creation of excess information in this way is a good reminder of the need to evaluate an information system on the basis of a cost-benefit analysis.

The lack of information on products and components in terms of usage and cost can lead to difficulties in focusing the role of Facilities Management and establishing the supply chain within it. Difficulties in monitoring and tracking financial information can also prevent efficient budget control, accurate estimation of work, and contract and purchase management. Good planning in maintenance, operation and refurbishment can be hindered by the availability of life cycle information that is, for instance, crucial in the planning the replacement of components.

Currently, there are no standards that support information exchange and sharing across the building life cycle. Given that there is potential for improvement in business process though the exchange data on the facilities management process, there is a growing need to investigate the issues involve in developing a standard that can benefit this most important part of the business life cycle. This standard could then be use to assist in the development of an information management system to support the exchange of information and the assessment of facility requirements. Such an information system requires a large volume of data. Accurate assessment of a facility's needs requires knowledge of equipment standards from a design and construction information systems, access to accurate maintenance records and repair and replacement costs, access to operation and occupancy information, other operating costs, space management data, operation standards and data from occupational and health and safety information system and from a financial and commercial information system.

An integrated information system as shown in Figure 3 could assist facility managers and other project tem members to combine data and information on a facility's life cycle, and base on the integration of cost and commercial data, design and manufacturing and construction data together with facility operation and maintenance data.
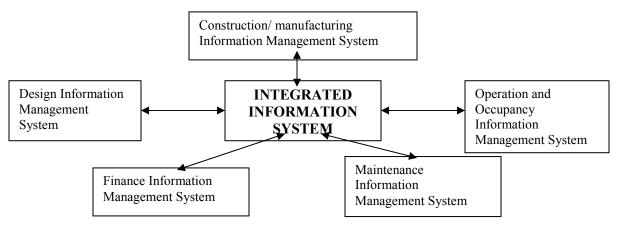
Figure 3 : Integrated Information Management System

CONCEPTUAL FRAMEWORK

The overall conceptual framework that forms the basis of this pilot research project is shows at Figure 4.
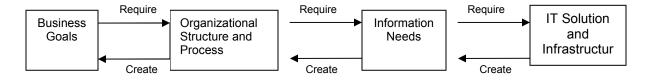
Figure 4 : Sample of Conceptual Framework

This conceptual model hyphenise that information technology acts as both amenable (provides new possibilities for organizations to achieve business goals) as well as a source of innovation (emerging technology provides new possibilities for organizational structure and processes and may generate new business goals)

In addition, this model may influence organizations in at least three different ways:
1. Strategic positioning
    Information technology may provide a means for organizations to uniquely position themselves in the market place in a manner that would be impossible without the availability of information technology. Examples of strategic positioning are emerging in the form of 'virtual organizations' which provide substantially improved value to customers compared to traditional organizations. Strategic applications of information technology may involve inter-organizational information sharing, such as the use of distributed database.
2. Work group productivity
    Instead of affecting the entire organization, work group productivity effect subsets of an organization. The use of groupware (e.g., Internet collaborative applications) has the potential to empower and integrate project teams for substantial improvements in project productivity and at the same time reduce the need for middle management.
3. Process redesign
    Process redesign may affect the productivity of one or more individuals as jobs are reconfigured and processes simplified. Information technology can facilitate the task of process redesign by providing tools that eliminate routine jobs and decentralize decision-making.

CONCLUSION

As developing countries, face the new opportunities and challenges of the global network economy, there is increasing debate about how ICT can more effectively enable socioeconomic development. Although several countries have in fact created national ICT task forces and developed national ICT strategies, the lack of comprehensive frameworks to illustrate how to use and deploy ICT development leaves nations struggling to identify effective strategies, sometimes even pursuing detrimental and costly approaches.

Strategies for use the ICT are not universal. Countries face different circumstances, priorities and financial means and should therefore adopt different strategies accordingly. The framework can be help in determining a strategy regardless of what goals have been established, since coordinated action along the five areas identified in the framework is always likely to yield more effective results. However, the evidence and analysis presented suggest that strategy that focuses its ICT interventions towards the achievement to development goals is more likely to achieve marked socioeconomic development.

Facility management is essentially workplace management. In essence, it is a manifestation of facility management as the interface that manages changes in people, facilities and technology. They are many opportunities and expansion areas be it in properties, human resources, finance or ICT. Facilities management should have the ability to anticipate as to what organizations will require in future years. In the past, the role of facilities was merely that of service provider, and now, facilities management as a business solutions.

REFERENCES

Becker, F. (1990). *The Total Workplace*. Van Nostrand Reinhold, New York

Bernard William Associates (1999). *Facilities Economic*. Building Economics Bureau Ltd.

Brian a. and Andrian B. (2000). *Total Facilities Management* Blackwell Science, USA.

Daylon, D. (1987) *Computer Solution for Business: Planning and Implementing a Successful Computer Environment*. Microsoft Press, Redmond, Washington.

Henderson, J.C and Venkatraman, N. (1994). Strategic alignment: a model for organizational transformation via information technology, in *Information Technology and the Corporation of the 1990s : Research Studies*, T.J. Allen and M.S. Scott Morton eds. Oxford, Oxford University Press.

Konsynski, B. (1996). Electronic commerce and the extended enterprise, in *Competing in the Information Age: Strategic Alignment in Practice*, J. Luftman, Ed. Oxford: Oxford University Press.

Linariza, H. (2000). *Facility Management : An Introduction*. School of Housing, Building and Planning, University Science Malaysia.

Mohamed A. El-Haram and Andrew, A. (2002). *The Role of the Facility Manager in New Procurement Routes*. Journal of Quality in Maintenance Engineering, **8**(2), 124-134.

Peppard, J. (1993). Using IS/IT to gain competitive advantage. in *IT Strategy for Business*, J. Peppard, Ed. London: Pitman

Peter, B. (1995). *Facilities Management Towards Best Practice*. Blackwell Science, USA.

Expert System in Supporting Business: The Challenge and Future Prospect

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ABSTRACT

Business environment is paying increased attention for expert system technology to aid in decision making. Business Expert System (BES) is computer applications that provide decision support similar to that of human expert in solving problems. Through expert system (ES), rules can be associated to evaluate the conditions and determine the result. There are several areas in business that employed ES to help the business run more efficient and fast in decision making such as product availability, credit grades, security levels, document generation, insurance and many more. Nowadays there are many software and technologies that have been developed to help naïve developer to construct an ES for their business. This paper discusses these software and technologies and reveals the advantages of the ES in business and also its future prospect. This paper also discusses the challenges of implementing ES in business and the sign of new life in the rule-based system market, which suggest a coming upswing of interest.

INTRODUCTION

Business and its environment are more complex today than ever before and the trend is toward increasing complexity. The decision making process today is more complicated than it was in the past. Thus, experts are needed for advice when an organization faced with complex decision to make or a problem to be solved. These experts have specific knowledge and good experience in the problem area. In order to help decision maker, ES is essential because of its ability to mimic a human expert.

ES is a system that uses human knowledge captured in a computer to solve problems that ordinarily require human expertise (Turban & Aronson , 2001). The purpose of an ES is to capture the specialized knowledge and experience of experts and apply them to individual problems. This knowledge then stored and manipulated by the system to provide a specific advice, hint, explanation, conclusion and recommendation in reaction to input by users. ES can make inferences and arrive at a specific conclusion. Then, like a human consultant, it advices non experts and explains, if necessary, the logic behind the advice (Jackson, 1998). Extracting the relevant knowledge from the human expert is a critical task and usually will be done by a knowledge engineer, an individual who studies how human experts make decisions and translates the rules into terms that a computer can understand, and who will then build the ES knowledge base (Peter, 1998).

ES as one of the computerized support system is quickly gaining credibility in many organizations world wide. Within recent years, ES have been built and implemented for many business applications. At a slightly later time, business began to learn and experiment with the ES technology in order to build up an in-house capability for this advancing technology. ES will serve as a tool to improve the effectiveness and efficiency of selected business operations.

EXPERT SYSTEM IN BUSINESS

The growing number of successful applications of ES such as medical diagnosis (Sridhar & Kumaravel, 2002; Venkatachalam *et al*., 2002), environmental (Rahman *et al.*, 1999; Ta-oun *et al.*, 1999), agriculture (Tahir & Tanalol, 2002), engineering (Saad & Bolong*,* 2002), business and many other applications have prove the effectiveness and the efficiency of ES. In terms of business functional areas, ES has been and is continuing to be built in applications such as finance, accounting, marketing, contracting, strategic management, tax planning, insurance, fault isolation and others. A survey by Eom (1996) revealed that many ES have a profound impact, shrinking the time for tasks improved customer satisfaction, improved quality of products and services, and accurate and consistent decision making.

The ability to speed up the processing time and the accuracy of selection, make ES very effective in insurance organizations as the entire industry becomes increasingly more complex. For example, The Meiji Mutual Life

Insurance Company in Japan used Life Insurance Plan Selection ES to help them in order to overcome the problems faced by the company (Attar, 2003). The company found difficulties to ensure that all the insurance sales staff had the expertise and the latest knowledge required to provide the best advice and services to the customers. Attar (2003) has developed the ES so that when the details of a customer are entered, the system assesses the suitability of all plans and report on the best five suited to their needs and a justification for the choice.

Flory (1997) reveals some advantages of ES as decision tools in the performance of complex accounting tasks, like easy access of a comprehensive information storage system, uniformity and consistency in the performance of accounting functions and can solve actual accounting problems as well as to help train inexperienced accounting personnel. Boer and Livnat (1990), constructed ES to determine the accounting treatment for leases by the lessee. The system was used as a teaching aid. The students in one accounting class used the ES and textbook material, while another class used only the textbook material in solving problems pertaining to leases. The results indicated the students that used the ES made fewer errors in classifying leases as either capital or operating leases than did the students who used only textbook material.

Another business application that intended using ES is sales and marketing. For example, Elf-Atochem North America, the chemical manufacturers has been using ES to help people in sales and marketing (Attar, 2004). Atochem's sales people need to identify the best grades of product to meet precise technical specifications. Attar (2004) has developed Rilsan® Advisor, the ES that leads a series of questions about the customer's application by following decision trees that embody detailed expert knowledge about Atochem products. When the information about an application completed, it recommends grades to meet the needs. The system helps to reach high quality decisions for experienced sales people, while novices, the system act as a teacher who is expert in Atochem's products. Hence, gives them a set of guidelines that leads them away from choosing unsuitable products to start out a new application.

EXPERT SYSTEM FOR STRATEGIC MANAGEMENT

Expertise and experience are key factors for experts in strategic analysis in order to give advice on strategic matters such as the strength or the competitive position of an enterprise. ES may be able to do the same if this heuristic knowledge can be modeled and processed properly. Strategic analysis is one that is well documented and intricate, lending itself admirably to being modeled by an ES.

Applications Business System division of IBM has been using Business Insight, an ES for strategic management as a decision support tools to integrate both the qualitative and quantitative data that managers must take into account when planning strategy. According to McNeilly and Gessner (2003) from IBM Corporation, Business Insight presents a user with a strategic analysis, business observations, key factors influencing the business success, business strengths and weaknesses, and predictions for the success of different strategic options. From the user's response to questions posed by the system at input time, it can perform a range of analyses giving the user practical insight and advice on his business and marketing strategies. The system shows a trail of its logic for every comment or recommendation it makes.

According to Wierenga (1992), what makes these domains especially suited to knowledge-based reasoning, is the fact that many situations faced by marketing managers cannot be adequately represented by mathematical models, but instead rely on heuristic decision making. This, together with the extensive theoretical foundations of these domains have, makes ES on marketing problems potentially very strong, provided the expert's heuristic knowledge can be captured in the reasoning process (Arons *et al.,* 1998).

EXPERT SYSTEM DESIGN

Figure 1 shows the architecture that make up a typical ES for a particular problem domain. The architecture consists of two parts: the development environment and the consultation environment. According to Turban & Aronson (2001), the development environment is used by a knowledge engineer to build the components and put knowledge into the knowledge base, while the consultation environment is used by the end user to obtain expert knowledge and advice.

The user views and interacts with the system through a *user interface*. There are varieties of ES interfaces, including natural language, question-and-answer, menu driven or graphics. Somehow the best user interface is interfacing that user friendly.

Knowledge acquisition is the accumulation, transfer, and transformation of problem solving expertise from experts or documented knowledge sources to a computer program for constructing or expanding the knowledge base (Turban & Aronson, 2001). Among the sources of knowledge include human experts, end user, reports, books, regulations, database and web information. Knowledge acquisition is the "bottleneck" in the development of an ES because it remains the most difficult task to acquiring knowledge from expert (Turban & Aronson, 2001; Durkin, 1996; Tahir & Tanalol, 2002). This is so, since the acquisition of knowledge from human experts requires special skills and abilities by the knowledge engineers, as well as the application of techniques with an interdisciplinary character (Tzafestas & Tzafestas, 1997).

Figure 1: Architecture of an ES

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The "heart" of ES is the *knowledge base* which contains the domain knowledge. It contains both facts and rules. Fact is general knowledge about the problem domain while rules or also known as production rule is formal way of representing knowledge in heuristic manner that direct the use of knowledge to solve a problems in particular domain. A rule consists of an IF (condition) and a THEN (action) part. Swamynathan & Geetha (2002) pointed that knowledge represented by the production rule is relevant to the line of reasoning being developed if the IF part of the rule is satisfied; consequently, the THEN part can be concluded, or its problem-solving action taken.

The *inference engine* is the "brain" of ES that models the process of human reasoning. According to Durkin (1996), this components act as processor for ES that matches the facts contained in the working memory with the domain knowledge contained in ibbc knowledge base and draw conclusions about the problem. It searches the rules for a match between their premises and information contained in the working memory. When the inference

engine finds a match, it adds the rule's conclusion to the working memory and continues to scan the rules looking for new matches.

During the consultation session, all the facts that are discovered will be stored in *working memory*. Working memory matches the information enters by a user with knowledge contained in the knowledge base to infer new facts. The ES then enters these new facts into the working memory and the matching process continues until the conclusion is reaches.

One way that makes the ES looks unique because of its *explanation facility*. With this facility, ES can provide an explanation to the user about *why* the question is being asked and *how* the conclusion is being reached. Users will feel more confident with the results and more comfortable to use the system.

Human element in Expert System

The main people involved in ES developers are expert, knowledge engineer and user. Each plays a key role in the development of the system (see Fig. 2).

The Expert

The domain expert is a person who provides the skill and knowledge to solve the problems that most people cannot solve with much efficiently. Expert can be referred as a person who has worked in the domain area, understands its problem-solving-techniques and has the special knowledge, judgment and skills that are not known or available to most people. The domain expert is responsible to provide their expertise and knowledge to the knowledge engineer about how he or she done the job. The knowledge then will be represented as rules in ES.

Knowledge Engineer

The knowledge engineer plays several roles during the ES development. Generally, his or her main task is to elicit the knowledge from domain expert and transform elicited knowledge into the ES. Among the responsibility carried out by knowledge engineer are helps the expert to articulate the necessary knowledge, structure the knowledge and problem solving methods in a right way that allows the ES to solve problem, select the suitable software package that can best represent the expert's knowledge and inference strategies, responsible for coding, testing and reviving the system and also maintaining the ES.
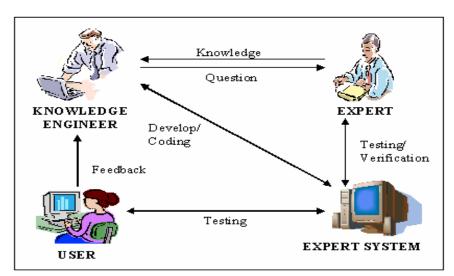
Figure 2: The Human Involved in Expert System

User

The end user is the individual who will use the system to assist them in making the decision. In most applications, acceptance of the system depends on how the system fulfills the requirements of the end user. Thus, the needs of the user must be considered throughout the design cycle of ES.

The development of Expert System

Like most artificial intelligence, building ES requires highly iterative process. Iterative here means a series of repeated actions (Awad & Ghaziri, 2004). Generally, work on the system begins with *domain identification phase*, where the world view or the potential of the ES has been examined. Figure 3 presents phases in ES development.

The next phase is to acquire the necessary knowledge on the problem that is used to guide the development effort. The process of acquiring knowledge from the expert is formally known as *knowledge acquisition*. This is done in initial interviews with the expert and by observing experts during the performance of their job. Next, knowledge engineer and expert begin the process of tracking the expert's problem solving knowledge. Once the knowledge engineer has obtained a general overview of the problem domain and gone through several problem-solving sessions with the expert, he or she is ready on begin actual design of system.

During the design phase, an initial prototype system is built. The purpose of the prototype is to provide a vehicle for obtaining a better understanding of the problem (Durkin, 1996). Once the prototype has been implemented, the knowledge engineer and domain expert *test* and refine its knowledge by giving it problems to solve and correcting its shortcomings (Luger, 2001).
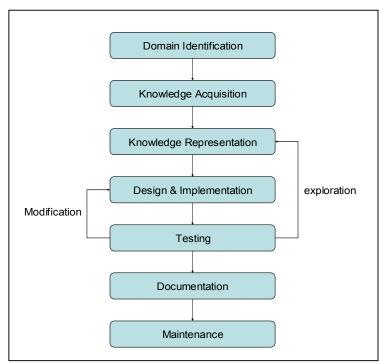
Figure 3: Phases in ES development

Once the overall structure of the system and its knowledge validated, the next phase is *documentation*, where it explains how to operate the system and possibly provides a tutorial that steps through the major operational features of the system. After the documentation phase, the system is deployed in the work environment. Then, it will need to be periodically *maintained*, because an ES evolves over time. Experts are constantly training themselves on new situations; an ES must be adjusted for these cases. Therefore, it is important that an effective maintenance program be established for an ES project.

THE CHALLENGES AND FUTURE PROSPECT

Business decision making (BDM) has a major impact on the level of quality of enterprise's operation. The main field of the management of the BDM is presented by the economic treatment of decisions, which are based on various sorts and types of information i.e. factual and heuristic (Potocan, 2001). Business Expert System (BES) is computer applications that provide decision support similar to that of human expert in solving problems. Through ES, **rules** can be associated to evaluate the conditions and determine the result. BES can help the decision makers had a variety and flexible information in business decision making. Implementing ES in business is still challenging. The challenges and the way to overcome the challenges will be discussed in next section. The sections also open the other way to enhance the ES to be coming a powerful tool in business.

The Challenges

There are several areas in business that used ES to help the business run more efficient and fast in decision making such as product availability, credit grades, security levels, document generation, insurance and many more. Heather (2000) quoted McGraw, the vice president of corporate technology at Cigital saying that businesses must determine which software **characteristics** are most important to their success such as reliability, usability, functionality, security, performance, production time, safety and so on. This characteristic is reflected the characteristic of ES because in business there are lots of business rule such as the criteria for selecting the proposal, planned investment, price to be set, budget structure and many more that can be use as the knowledge based for ES. Even though business rule change, ES still can adapt easily to the changes. Now days there are many software and technologies that have been developed to help naïve developer to construct an ES for their business. There are SUMit ES technology, VP-Expert, Expert Valuation System, ES Language Technology, ES for Advertising Persuasion (ESAP) and so on.

According to Kamel (2002), the failure in implement any technology are associated with the nature of the decision maker such as unwillingness to spend time learning, preference to rely more on personal experience and intuition rather than information technology tools and techniques and resistance to changes. ES is not replacing humans but support their decisions (Trencher, 1998). The objective is to augment and thereby assist humans. For example, an insurance company have several conflicting objectives when processing claims because claims experience is a major element of overall customer service and therefore fundamentally affects customer satisfaction; the insurer wants to be as responsive and quick as possible in handling claims. Insurer recognizes that a high percentage of claims are legitimate and does not want to alienate its good-faith customers by subjecting them to needless delay and inconvenience. On the other hand, it is critically important to identify potentially fraudulent claims that require further scrutiny. ES can help in several areas such as below:-

- To identify the factors that the best claims examiners use and the patterns, relationships and thought processes involved in examining factors to determine whether a claim might be fraudulent.
- To devise a way to collect appropriate data at the time a claim is filed, where it enable a thorough examination of the claim.
- In looking for the proper patterns and relationships to provide insurers with an automated warning of possible fraud, while at the same time expediting the handling of claims with a low probability of fraud.

An interview survey by Vedder *et.al* (1999), the immediate problem for Mary Kay Cosmetic Company in implementing the ES is there is no one in the company knew how to maintain the ES. This is because after completion of the project, Mary Kay did not continue its relationship with the developer. It will be a problem for the design team to add new rules into the ES because no one was available to make the changes. This problem can be solved either make business relationship with the developer or give a training how to maintain the ES to the staff that involve in using it.

Time pressure which served as a controversial factor for some situations, it has been attributed a creativity stimulating potential, while in other cases the time deficit has been indicated to suppress creativity. In business, a tool that consumes little time and easy to use, leaving more time for high-value managerial management activities are needed for creative problem analysis and decision development (Skyrius, 2002). For example, management at Mary Kay Cosmetics develop an ES to assist with the selection of packaging materials for cosmetic products based on marketing requirements and chemical composition of the product. The use of ES greatly simplified the organization and sequencing of the package decision process, thus **saving time** (with fewer and shorter meetings) and effort (spent on redesigns) (Vedder, 1999). Furthermore, the ES automated package/product compatibility, as well as some technical and cost feasibility issues. It's greatly speeded the entire decision process, saving approximately four weeks.

The Future of ES

ES can be more powerful tool if it's combining with other artificial intelligence techniques such as Fuzzy Logic (FL), Intelligent Agents (IA), Neural Network (NN) and many more. An accurate market intelligence and effective decision making is an essential for quicker access to information on their business, markets, customers, suppliers and distributors. This is leveraging competitive advantage for their business. According to Al-Sharouf and James (2004), the emergence of **software agent** technology, will give a supporting mechanism for enabling new trends in e-business. The agent is software that helps delegates in making decisions and also known as Intelligent Decision Support System (IDSS). They focus in building a statistical testing approach for testing multi-bidding e-commerce. The future direction is on address how and when to apply statistical approaches using software agents.

Cheng (2002) proposed an **intelligent agent-based** system that is capable of recommending optimal products based on the customer's current preferences obtained form the iterative system-customer interactions. The system is to recommend products that best satisfy the consumers current needs and with the optimal quality. The system use the ephemeral information provided by a consumer at the time they consulting the system for suggestions and the built-in expert knowledge about the products to look for the optimal ones. This decision making method is only used to recommend optimal notebook computers and home theatre systems. For future prospect, Cheng proposed whether this approach can be used for other products, especially for the products with more features such as digital cameras.

ES for e-business metrics with emphasis more on the data gathering and knowledge acquisition strategies were been build (Swamynathan and Geetha, 2002). The system generates rules using the induction learning algorithm and maps it to the JESS ES shell script. The ES gives a reports and expert opinion from data warehouse are very useful in decision making performance. However this system can be enhanced to include fully noisy data and totally random data by using FL. FL can be use to classify unknown and totally random data set into some useful production rule without adversely affecting the over all inference rules. FL is concerned with the reasoning about 'Fuzzy' events or concepts. Example of fuzzy concepts is 'salary is high'. When salary is high, at RM 8000 per month, RM 9000 per month or RM 10,000 per month? If we define the threshold of high salary at RM 9,000, then the implication is that a salary RM 8,999.99 is not high. When humans reason with terms such as 'high' they do not normally have a fixed threshold in mind but a smooth fuzzy definition. Humans can reason very effectively with such fuzzy definitions, therefore, in order to capture human fuzzy reasoning we need FL.

Other future prospect, ES in business can implement hybrid technologies to enhance the abilities of the system. According to Ariffin *et al.,* (2004), the combination ES, NN, FL and Natural Language Processing (NLP) can assured adaptability, personalization as well as user-friendly for the knowledge management system. ES is used to be the knowledge-based repository, where it is important to comprise a good data repository. NN is a model that mimics to human neuron system that ability in manipulates and learns from the set of input or information, where it used to utilize the previous sets of data and cases in order to predict or forecast the similar situation in future. Usage of NLP in knowledge management system will make the system owns the ability in understanding the natural human languages. This will provide the workers with additional elements like dictionary, interactive glossary module and machine translator. However there are further researches in making sure whether their hybrid methodology is possible and practically implemented.

DISCUSSION

This paper revealed the important of ES in business either in Decision Making System or Knowledge Management System. From the survey there are many papers that discussed the usage of ES in business for superior and successful company. The advantages of ES show that there are lots of potential on implementing ES in the business areas. The potential of ES in business are:-

- Performance – ES do not forget, but human does. By using ES in business the basic decision making suppose to be clearly not having a mistake.
- Reproducibility - Many copies of an ES can be made but to train new human experts is time-consuming and expensive.
- Efficiency – can increase throughput and decrease personnel costs such as ES not inexpensive to operate, much cheaper than paying the human expert and saving in wages (by eliminating a clerk).
- Consistency – ES similar transactions handled in the same way but human can be bias.
- Timeless – information will always be there when ever we need for decision making.
- Knowledgeable – The knowledge of multiple human experts can be combined to give a system more breath then a single person is likely to achieve.

ES can be more powerful when it has been combined with other artificial intelligence techniques such as Fuzzy Logic, Neural network, Natural Processing Language and many more. The combination will overcome the disadvantages of ES.

CONCLUSION

ES is well known in business as a system that improves company decision's making, knowledge management and strategic management. However the popularity of ES is drop off due of certain factors such as human perception, didn't have the sensory experience, didn't have common sense and not suitable for complex decision making.

Researches on ES are still active and will continue with some modest expansion. The most prominent companies today are CleverPath Aion (CA) (with Aion/Cleverpath), Fair Issac with Blaze Advisor, ILOG and Pegasystems.

There are three signs of new life in the rule-based systems market, which suggest a coming upswing of interest. Firstly, there is an increasing interest in business process management (BPM). Rule-based systems are not the same as BPM systems - they are business process *automation* systems - they are being suggested for use in the BPM context to help to support, automate or enforce processes across business functions. Pegasystems now describes itself as a BPM company, and companies such as Staffware and FileNet have partnerships with rule-based system companies

Secondly, conferences are on the rise for academics and for businesses, such as the RULE series of international conferences on rule-based programming sponsored by the Association for Computing Machinery (ACM), and European Business Rules Conference, Zurich.

And finally, there is a new three-letter acronym - the BRE or business rules engine. CA is the only company to explicitly adopt this in its nomenclature so far, but it always helps in the IT industry to have a buzzword or phrase similar to Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) or Online Analytical Processing (OLAP).

Although the popularities of ES is decline due of certain factors, ES still can be the best decision making tool in business if the ES combine with others intelligent techniques. Furthermore, the developer and the company should take a serious action in representing the knowledge into the system for better ES.

REFERENCES

Al-Shrouf, F. M., and James, W. L. (2004). An Agent-Based Knowledge Management Model for Enabling a Statistical Testing Approach to Decision Support E-Commerce. *Proceedings of Knowledge Management International Conference 2004.* Sintok, Kedah: Malaysia.

Ariffin, A. H., Rahmat, A. R. and Wan Ishak, W. H. (2004). Intelligent System Approaches to Enhance Knowledge Management in Organization: Premilinary Study. *Proceedings of Knowledge Management International Conference 2004.* Sintok, Kedah: Malaysia.

Arons, H. S., Waalewijin, P., and Flaes, M. (1998). *Implementation and Results of a Prototype Expert System on Strategic Analysis.*

Attar Software LTD. (2003). *The Life Insurance Plan Selection System at the Meiji Mutual Life Insurance Company.* http://www.attar.com/pages/case_ml.htm

Attar Software LTD. (2004). *Product Information Expert System goes on-line at Atochem North America.* http://www.attar.com/pages/case_ato.htm

Awad, E., and Ghaziri,H. (2004). *Knowledge Management.* Upper Saddle River, NJ: Prentice Hall.

Boer, G. and Livnat, J. (1990). Using Expert Systems to Teach Complex Accounting Issues. *Issues in Accounting Education.* (pp. 108-119).

Cheng, C.L. and Wei, P.L. (2002). Design and Implemention of Expert Agents for Product Recommendation to Support Electronic Shopping. *Proceedings of the International Conference on Artificial Intelligence in Engineering and Technology.* 17-18, June 2002. pp 714 - 719 . KK, Sabah : Malaysia.

Clark, H. (2000). *Ask the Expert Technical Pointers on Successful Software Risk Management.* www.srmmagazine.com/issues/2000-q4/expert-sum.html

Durkin,J. (1994). *Expert System: Design and Development.* NY: MacMillan.

Eom, S. B. (1996). A Survey of Operational Expert Systems in Business (1980 – 1993). *Interfaces*, Vol. 26, No.5.

Flory, S. M. (1997). *Here's an Expert System-Based Support Tool for making Accounting Decisions.* http://www.nysscpa.org/cpajournal/old/11583355.htm

http://www.brs-inc.com/rev003.html

http://www.coba.unt.edu/bcis/faculty/veddar/Idsi.pdf

http://www.few.eur.nl/few/people/deswaanarons/publ/de_swaan_arons_waalewijn_flaes_ribes98.pdf

Jackson, P. (1998). *Introduction to Expert Systems,* 3rd ed. Reading, MA: Addison-Wesley.

Kamel, S. (2002). The Use of DSS/EIS for Sustainable Development in Developing Nations. *Proceedings of the Informing Science Conference.* Krakow: Poland (CD-ROM).

Luger, G.F. (2002). *Artificial Intelligence: Structures and Strategies for Complex Problem Solving,* 4th ed. Reading, MA: Addison-Wesley.

McNeilly, M., and Gessner, S. (2003). An Expert System for Strategic Analysis.

Peter, S. (1996). *An Introduction to Knowledge Engineering.* International Thompson Computer Press.

Potocan, V. (2001). How to Provide for an Appropriate Dealing with Business Decision-Making from the Viewpoint of Informing. *Proceedings of the Informing Science Conference*. Krakow: Poland (CD-Rom).

Saad, I., and Bolong, N. (2002). Expert System for Renewable Energy: Conceptual and Methodologies Approach. *Proceedings of the International Conference on Artificial Intelligence in Engineering & Technology.* 17-18, June 2002. pp 653 – 656. KK, Sabah : Malaysia.

Sridhar, S., and Kumaravel, S. (2002). Expert Systems for Renal Calculi Analysis. *Proceedings of the International Conference on Artificial Intelligence in Engineering & Technology.* 17-18, June 2002. pp 540 – 543. KK, Sabah : Malaysia.

Swamynathan, S., and Geetha, T.V. (2002). Design of Expert System for e-Business Metrics. *Proceedings of the International Conference on Artificial Intelligence in Engineering & Technology.* 17-18, June 2002. pp 607 – 611. KK, Sabah : Malaysia.

Tahir, A., and Tanalol,S.H. (2002). Knowledge-Based System in Agriculture: Knowledge Acquisition and Implementation. *Proceedings of the International Conference on Artificial Intelligence in Engineering & Technology.* 17-18, June 2002. pp 227 – 231. KK, Sabah : Malaysia.

Trencher, M. L. (1998). *Expert System Come of Age to Help Drive Insurers Business.* RMIS- Web National Underwriter Risk Management Information System.

Turban, E. and Aronson,J. E. (2001). *Decision Support Systems and Intelligent Systems*, 6th ed.

Tzafestas, S. G., and Tzafestas, E. S. (1997). *Knowledge Acquisition: A Comprehensive Overview Of Methods and Tools.* http://www.ici.ro/ici/revista/sic97_2/TZAFESTA.html

Upper Saddle River, NJ: Prentice Hall.

Vedder, R. G., Dyke, T. P. V., and Prybutok, V. R. (1999). *An Expert System That Was.*

Venkatachalam, P.A., Ngah, U.M., Hani, A.F., and Shakaff, A.Y. (2002). Seed Based Region Growing in Breast Cancer Detection and Embedded Expert System. *Proceedings of the International Conference on Artificial Intelligence in Engineering & Technology.* 17-18, June 2002. pp 464 – 469. KK, Sabah : Malaysia.

Wierenga, B. (1992). Knowledge Based Systems in Marketing, Purpose, Principles, Performance, Perceptions and Perspectives. *Management Report Series*, no. 112.

Information Technology and How It Can Improve the Muslims in the Field of Education

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ABSTRACT

Information technology (IT) is an area that has affected all our lives in one way or another since the late 20th century. This technology has rapidly changed the world to the point where we now feel that we live in a much smaller place. These IT developments, especially the Internet, have brought people closer together despite the distances between them. Muslims should accept the challenge and use it to the greater benefit of the Islamic community at large. In their desire not to tarnish the image of Islam, Muslims should be careful not to behave in such an extremely conservative manner as to leave a gap within the Muslim communities of the world. This research is targeted at identifying ways in which IT can bring a benefit to the ummah in general and more specifically to enhance the area of Education. This can be divided into distance learning (online course), da'wah and islaah, fatwa online, translation of Quran and Hadiths, information, Islamic software development, and sermons (khutbah). In Malaysia, some of the schools have been equipped with computers for the school children to have the exposure in using technology. Another example, the New Straits Times website has a section in education for even the preschool children, primary and secondary schools' students, and up to tertiary education. This research concluded by promoting the use of IT in the field of Education. Thus, the quality of learning for the Muslims can be improved. IT can help to invite others to know more about Islam.

INTRODUCTION

Objective

This research objective is to explore the possibilities of Information Technology to improve the Muslim ummah in the area of education.

Methodology

This research will be based on secondary sources such as articles, journals, books, Internet, etc. From these sources, then it will formulate the important points as put forward by scholars and IT professionals on how Information Technology can be used as a tool to improve the ummah.

Muslim Ummah

What is meant by Muslim ummah is there will always be a group of righteous people on Earth. The Muslims as a whole are the ummah that unites around the *Qur'an* (Holy Book) and *Sunnah* (act of the Prophet Muhammad SAW). They carried out the basic Islamic duties, believed in the principles of faith, and subscribed to Islamic moral values. The Muslim ummah will never be devoid of righteous people. Most Muslims adhered to the fundamentals of Islam and admitted that there is no God but Allah and that Muhammad SAW is the Messenger of Allah. The Arabic word for nation, "ummah", is employed in the Qur'an with many different meanings. The Arabic scholar al-Fayruzabadi mentioned ten different meanings for the word, which some of them are:
1. "A leader or example for others". Allah said: "Ibrahim (Abraham) was indeed a devout model of behavior (ummah), pure in faith and not of the polytheists" [Surah al-Nahl: 120]. This is the way the majority of the classical commentators interpreted this verse. Alternatively, the word "ummah" in this verse could be interpreted as "nation", meaning that he was a nation unto himself, since he was at one time the only believer on the face of the earth.

2. "An era of time". Allah said: "Of the two, the one who had been released remembered him after a period of time (ummah)" [Surah Yusuf: 45]. Likewise, He said: "If We delay for them their punishment until a specified term (ummah), they will ask: "What kept it back?"" [Surah Hud: 8].

3. A mode of thinking or an approach to life, whether correct or false. Allah said: "Nay! They said: "We found our forefathers following a certain way (ummah), and we will guide ourselves by their footsteps". Likewise, whenever We sent a warner to any people before your time, the wealthy among them would say: "We found our fathers following a certain way, and we will follow in their footsteps"" [Surah al-Zukhruf: 22-23].

4. "A group of people", however small. Allah said: "And when he arrived at the watering place in Madyan, he found there a group of men (ummah) watering their flocks" [Surah al-Qasas: 23]. Allah also said: "Every time a new group (ummah) enters, it curses its sister group" [Surah al-A'raf: 38].

Information Technology (IT) could be applied to improve the Muslim ummah in the area of economy or market, social, political, education, and much more. This research strongly suggested in applying Information Technology (IT) in the area of Education, which can be divided into Da'wah and Islaah, Software, Electronic, and Ijtihad. This paper explored on how IT could bring improvement to the ummah and to promote Islam to the world.

INFORMATION TECHNOLOGY IN ISLAMIC PERSPECTIVE

Islam did not against the development or enhancement of technology. Islam concerned with the problems faced by mankind, and Islam also encouraged Muslims to develop themselves, so that they could benefit the ummah. "It deals with all aspects of man's economic and political but always in the framework of total human development" [Z. Kausar].

Even though Islam encouraged its followers to seek prosperity and cope with the technology, Islam also laid some foundations that must be followed. If these foundations abandoned, then Muslims might lose in pursuing the worldly life. Despite of seeking progress, Islam concerned with effects on moral and faith. Therefore Islam has laid some philosophical foundations for development.

"The Philosophical foundations of the Islamic approach to development are as follows:
1. Tawhid (God's unity and sovereignty). This laid down the rules of God-man and man-man relationships.
2. Rububiyyah (divine arrangements for nourishment, sustenance and directing things towards their perfection). This is the fundamental, law of the universe, which threw light on the divine model for the useful development of resources and their mutual support and sharing. It is in the context of this divine arrangement that human efforts took place.
3. Khilafah (man's role as God vicegerent on earth). This defined man's status and role specifying the responsibilities of man as such, of a Muslim ummah as the repository of this khilafah. From this followed the unique Islamic concept of man's trusteeship, moral, political and economic, and the principles of social organization.
4. Tazkiyah (purification plus growth). The mission of all the prophets of God was to perform the tazkiyah of man with God, with man, with natural environment, with society and with state" [Z. Kausar].

Islam encouraged its followers to seek knowledge and mastered it, so that they could teach and inform others. Information technology is a very interactive means of sending information because it integrated audio, motion, and globally connected. If Muslim could take this chance to learn about IT, they could widely spread Islam all over the world. Through the Internet, distance is no longer a barrier for ending information.

Al-Afghani stated "if a community did not have a philosophy, and all the individuals of that community were learned in the sciences with particular subjects, those sciences could not last in that community for a century. The Ottoman government and the Khedivate of Egypt have been opening schools for teaching of the new sciences for a period of sixty years, and they are yet to receive any benefit from those sciences" [Z. Kausar].

Al-Qur'an and Information Technology

There are many verses in the Holy Qur'an that could be used as guidance for Muslims to understand Islamic opinion about world development or technology enhancement. Some are listed below:
- "Truly, successful is one who causes his self to grow in purity" [Al Qur'an, 91:9].
- "And seek, with the wealth that God has given you, the abode of the Hereafter, but do not forget your share in this world. And do good (to others) as God has done good to you, and spread not mischief, for God does not like those who do mischief" [Al Qur'an, 28:77].
- "Say: Travel through the earth and see was the end of those before you" [Al Qur'an: 30:42].

-       "We (Allah) revealed (Our Will) to him (Nuh) saying: Build an ark under our watchful eye, according to Our guidance and Our inspiration!" [Al Qur'an, 23:27].

The Hadiths and Information Technology

Here is some of the Holy Prophet's SAW saying which could be used as guidance for Muslims in understanding Islamic view about IT:

-       "Earning a lawful livelihood is obligatory upon every Muslims" [Suyuti, al-Jami'al-Saghir].
-       "A man has not earned better income than that which is from his own effort" [Sunan Ibn Majah].
-       "Seek the bounty of God and be not a burden on others".
-       "He who seeks the world lawfully, to refrain from begging, to cater for his family, and to be kind to his neighbor, will meet God with his face shinning like the full moon" [Mishkat].

EDUCATION

Educational Technology is a term widely used in the field of education (and other areas), but it is often used with different meanings. For example, it could be meant by hardware, which is a device to deliver information and serve as tools to accomplish a task. Hence, educational technology referred to a particular approach to achieving the ends of education. Instructional technology referred to the use of such technological processes specifically for teaching and learning. The evolution of multimedia has significant and positive impacts in the concept of da'wah (invitation towards Allah). Apart from extensive usage in the education, entertainment and business fields', multimedia titles could also be used to spread Islamic teachings.

There are growing numbers of multimedia CD-ROMs that carried various Islamic topics such as prayer presentation, interactive, video hajj presentation, and Qur'an translations in various languages, together with Hadiths, history of the Prophets, Islamic history and Muslim contribution to the world. Coupled with multimedia features (such as text, sound graphics, picture, video and animation) for interactive environment. The aim is to provide both Muslims and non-Muslims with an informative, unique and exciting way to learning Islam. An example of such application is multimedia CD-ROMs titled "Sign of The Creator" by Harun Yahya.

Distance learning [Online Islamic courses

It enabled students to study in a faraway country without really having to be physically there. An example would be an Iranian student residing in Iran, but studying an American degree in an American institution. Current information technology (online streaming and advanced web cam technology) allowed video-conferencing over long distances. Therefore a student thousands of miles away could still participate with the course. This is an advantage for Muslims because they (or their parents) fear that the western environment and culture would affect the students.

Another issue is on paying the tuition fees, and expenses of a place where there is a high cost of living such as studying in the UK. There are other issues of racism and social bias that could be avoided, and this is an advantage for the women who strictly enforced the principles of covering the "aurah" are followed. This way a person could benefit from a good education from the USA or UK for example, but still remained committed to Islamic morals and teachings. In addition, it could save the costs of accommodation and living in the advance countries where the cost of living are much higher.

Moreover, there are other educational facilities such as, online Islamic digital libraries (www.academicinfo.net/Islamlibrary.html) that have links to other sites and offered quality reading in the world. A lot of interests have been expressed in teaching Muslims about the astronomy of Islam, which include the timings of the prayers and how to determine other important events of Islam.

Da'wah and Islaah

"Da'wah" is the best way to spread Islam and increased the community of Muslim ummah in the world. "Da'wah means an invitation. In the Islamic context it means an invitation to Islam. Therefore Da'wah means conveying the message of Islam to Non-Muslim and inviting them to Islam, while "Islaah" means to improve,

correct, rectify or repair. In Islamic terminology, "Islaah" means correcting a Muslim or providing more knowledge of Islam to a Muslim" [Dr. Zakir Naik].

Based on the above definition, Da'wah is possible to be done to invite others to learn about Islam. However, basic knowledge and good understanding of Islam are necessary in order to spread Islam. In the modern era, Da'wah could be done in many ways, and application of IT played an important role in Da'wah such as electronic media, broadcasting media, print media, Internet and other media.

a. *Forms of Da'wah*

According to Dr. Zakir Naik, there are two forms of Da'wah:
1. Live and direct without any media. In this term Da'wah is done directly, face-to-face or without any interface. The message of Islam could be brought forward to Non-Muslim directly regardless the time and places.
2. Indirect through means of media. IT played an important role in indirect Da'wah; IT tools are used in this form of Da'wah.

b. *Different Media of Da'wah*

There are many medias that could be used for Da'wah. Dr. Zakir Naik in his "Forms of Da'wah" divided the medias into four categories:
1. Print Media
2. Audio
3. Video
4. Electronic Media

Firstly is print media. Print Media is a media that provided articles to the public. Print media could be classified into non-periodical and periodical. Non-periodical print media consisted of literature such as pamphlets, booklets, books, and more. Periodical print media consisted of newspapers, magazines, which are published periodically, either daily, weekly, monthly, annually, etc. Islamic literatures, magazines could be easily found today and they provided articles about Islam.

Secondly is audio. Audio is a media that provided a sound. Audiocassettes, audio compact discs, and digital audiotapes are the most popular audio media. The advantage of audio media is it could be heard anywhere, anytime such as at home, in the vehicle while traveling and walking or moving to the other places with the help of portable audio equipment. It also could be heard by a lot of people through radio broadcast.

Thirdly is video. Video is an audiovisual media or a media that provided sound and picture. The most popular video media are videocassettes, video compact discs (VCD) and digital video discs (DVD). It could also be shown to the public through cable TV networks, TV stations and satellite TV channels.

Fourthly is electronic media. Electronic media or computer media is another media, which could be used to do Da'wah and Islaah. Internet is used to convey messages and improve Muslim ummah. Now, there are many Islamic websites such as www.islamonline.net, www.islam.com, which provided forum discussion, chatting, and mailing list in order to get the latest information. It is very useful and the easiest way to do Da'wah, Islaah, and to know more about Islam. It will have an impact on the ummah to improve one's knowledge and practices to be a good Muslim. Electronic media could be stored on hard discs, diskettes, CD ROMs and DVD.

The Internet also facilitated the propagation of Islam. There are materials available in a variety of languages on the web, which are published by individuals and organisations. Many scholars put their ideas on the web so people could learn the thoughts of (and be influenced by) "scholars" who lived thousands miles away, besides listening to their local imam (scholars) [Gary Bunt].

Newsgroups could be used as a tool of Da'wah; which non-Muslims often contribute to the posts. They asked questions or voiced their comments to the Muslims. This is a chance to give Da'wah and dissolved misconceptions and prejudices. Anonymity of the Internet allowed those who might otherwise not approach Muslims the chance to interact and learn about Islam [Abdullah Al-Wassiti].

Fatwa on-line

"On-line fatwa" is one of the developments of networking. Fatwa that are subjected to database searched for a particular keyword or topic. Individuals could access to variety of websites, and search from the archives, which relate to one interest and field. For examples, IANA website and Fatwa Online provided archive of religious opinions on various issues. Surfers are allowed to send questions that they felt doubt with, and the scholars will response to them [Gary Bunt].

Islam Online is the only one of the Muslim web page, which is professionally produced and used the latest web technology, in Arabic and English. Its technology is produced and maintained by the same group of companies that also moved Al-Jazeera Satellite Television online in Arabic. It provided a daily selection of international news and interest to Muslims with wide range of advices from formal fatwa issued by the scholars in response to psychological counseling focused less on behavior than on psychology. This site, and others similar to it, also offered composed lessons, hadiths interpretation, scripture and other pronouncements.

Translation of Qur'an and Hadiths

Numerous versions of the translations of the Qur'an could be found, linked into diverse explanation and other materials. A good example is the website produced by Harf Information Technology, which adopted the multimedia aspects on the Internet to allow recitations to be played together with Arabic texts, English translations, and high-quality recitations. Beside the Holy Qur'an, most of the famous Hadith books also translated into English.

Information

New types of information technology such as the Internet and CD-ROM could be used to enhance courses in colleges and universities. Information Technology could improve Muslim ummah in term of knowledge. Education is the key to success. Every mankind should seek knowledge for improvement. It is supported by hadiths of Prophet SAW which one of them is, "Seeking knowledge is obligatory to all Muslim man and women". This showed that education is very important for everyone. Through IT, education could be spread widely for easy learning. There is no limit in gaining information. Beside IT could increase the knowledge on Muslims; it could also uphold the Muslims to become an educated ummah.

In the USA computers are used extensively not only by the adults but also by the children who learnt most of the Islamic rituals and knowledge through computer programs such as ALIM, AL-USTADH and AL-QARI. The use of ICT in general could benefit Muslim children, for example, Islamic computer programs available locally to enhance the teaching at the Madrassa (school) [Prof. S. Rogerson and M. M. Begg].

A large number of Islamic books and articles are also available for free including areas of belief, Islamic jurisprudence, guidelines on the Islamic morals and character, selected supplications, comparative religions studies and material for non-Muslims, Islamic magazines, Islamic history, information about almost all Muslim countries, websites with news services on the Muslim world [Gary Bunt].

According to Prof. S. Rogerson and M. M. Begg, IT skills are now an obligatory skill for life besides the numeric and literacy skills. "Indeed the Imams (scholars) too should be IT literate if they are to function to their full capacity. In addition to giving answers to questions in person, they ought to be able to reply to email questions from people who may be at the other side of the world. Islam is portrayed as a global religion, it will therefore demand global Imams – only the new technologies can provide such a capacity when positively used and without disregarding the social responsibility issues that have arisen through the computing revolution".

To place a computer in every mosque, able to unite the ummah through virtual communication among all the Muslims all over the world. This cyber mosque could be an accurate reference to the Islamic ummah and sources of new activities and current issues about Muslim. This would give opportunity for people to exchange opinion through cyber mosque.

Islamic Software Development

Another area in which IT could improve Muslim ummah is the development of software. There are lots of Muslims who have the intellectual capabilities to develop software. Now OIC (Organization of Islamic

Countries) has set up a committee called COMSTECH (Standing Committee on Scientific and Technological Co-operation) to promote scientific and technological corporation among its 57 member countries. Any organization involved in an effort to improve and strengthen the state of science and technology within the Muslim world faced gigantic challenges. COMSTECH has undertaken a large number of important programs to meet these challenges [Professor Ata-Ur-Rahman]. Software could be developed for academic, business, and other purposes. Such programs should include Islamic and ethical principals. For example, software to calculate Zakat (tax) payment for a business. This may be useful for both the zakat payer and the collector as it could save the time in calculating the zakat.

Harf Information Technology is a company that applied e-commerce for their business in providing Islamic software products. In order to see its products, log on to www.harf.com. There are many Islamic software products that are provided by Harf Information Technology, which some of them are Alfazh Al-Qur'an and Al-Mushaf (for desktop publishing).

Alfazh Al-Qur'an is a program that is used to memorize the Holy Qur'an and to learn the correct recitation. This program also taught the pronunciation of Arabic sounds and the recitation rules. This advance educational method helped one to memorize the Holy Qur'an by listening to it and repeating after the tutor. This program has two sections, which are the educational section and the practice section. The educational section taught us the Arabic alphabet, with different vowel marks, the pronunciation, the rules of recitation, and provided exercises and tests for evaluation. The practice section displayed the Qur'anic text and highlighting the recited verse and the letters that have special rules of recitation, so one could memorize the Holy Qur'an verse by verse. Translations of the meaning of the Holy Qur'an are available in Arabic, English, German, Indonesian, Turkish, French, and Malay. This program runs under Windows 95, 98, 2000.

Al Mushaf (for desktop publishing) is a program that allowed one to add Qur'anic text to mail message, and personal document to be printed out. It has many abilities such as to add Tafsir of Al-Jalalain below the copied verse or as a footnote, to insert the translation, control the format and fonts of the informatics text services, and to identify (color) different Qur'anic text recitation Waqf signs, "Allah" words, Sugda and Hezb signs. This program runs under Windows Arabized and 2000.

Beside Islamic software products, Harf Information Technology, which started in 1985, also developed great Islamic materials on electronic media. One of them is The Holy Qur'an Digital Book.

The Holy Qur'an Digital Book used the voice of Saikh Abdul-Rahman Al-Sudeis and Saikh Saud Al-Shureim who are the Imam of Al-Haram Mosque in Mecca. The Holy Qur'an Digital Book intended to help students, beginners, and non-Arabs to learn the Arabic language and the Qur'an through listening to the recitation and reading the instant Arabic text. This Digital Book is compact size and portable. It provided the user with convenient listening with the help of the sensitive audio feature. Other features in The Holy Qur'an Digital Book (from Harf Information Technology) are:

- LCD (Liquid-Crystal Display) in Arabic.
- Online audio-visual display.
- Easy search for Surahs and verses.
- Repetition of the required sentence for easy memorizing.
- Index of Surah names.
- FB and FF buttons for rewind and forward.
- Pause and replay functions.
- Book marking of Surahs and verses that will be saved even after shutdown.
- Usable at night through background light.
- Pocket size.

The specifications of The Holy Qur'an Digital Book are:
- Size: 107.5 mm x 68 mm x 16.3 mm.
- Weight: 105 gm. (including batteries).
- Power: DC 3 V.
- Batteries: 2 x AAA.
- Speakers: 5MW for right and left speakers.
- Frequency: 20 Hz - 20 kHz.

There is another website that also provided Islamic materials in electronic media. In order to see its products, log on to www.islamicbookstore.com, this is the Internet's largest Islamic store. One of its products is Al Hilal (wallet-size digital qibla compass, prayer time, calendar and calculator).

Al Hilal provided digital qibla compass functionality, prayer times for over 250 cities of the world, calculator feature, and more. Al Hilal is built in small size, sleek compact case portable so that fit into the pocket, or wallet.

The features of Al Hilal are:
- Qibla direction indicator for 250 cities worldwide.
- An automatic alarm for the five prayer times for 250 cities worldwide.
- Local time for 250 cities worldwide.
- Convenient calendar.
- Useful calculator.
- 5 local methods by region, Shafie and Hanafi.
- Daylight savings time.

QIBLA.
- Press the QIBLA key.
- The direction of Mecca will be displayed on the screen.
- The arrow at the bottom of the screen indicates the direction of Mecca

SALAT
- Every prayer time, Al Hilal will ring the alarm automatically and display the prayer time on the screen.
- Press the SALAT key.
- View the upcoming or previous prayer times by pressing the salat keys.

SPECIFICATION
- Display: Dot Matrix LCD.
- Size: 88 * 59 * 7.7 mm.
- Weight: 36g (including battery).

With the help of Al Hilal, one could easily know where the Qibla is and the prayer times regardless the time and places. It is easy to bring and useful when traveling.

Ijtihad

In his book G. Bunt, discussed about decision-making issues in Islamic context. A number of interviewees' showed people believed that the Internet (and related technology) could be the greatest force of any innovation or social change on Muslims during the next few decades. According to an interviewee at the International Islamic University in Islamabad, the development of IT technology allowed people to make ijtihad much easier. In other word, ijtihad is to find independent judgment based on the Islamic sources. By typing the keyboard, a lot of information on certain issues could be accessed. Even though the technology helped in making decision, without using the human's mind, ijtihad could not be done. However it is visible that modern devices made ijtihad much easier and especially with email, for example, it is easier to verify the findings with any scholars who lived in other parts of the world [G. Bunt].

Sermons (Khutbah)

There are large amount of sermons available online which these are one of the transformational qualities of the Internet on Muslims. Some of them prepared for local (for example, Tanzeem-e-Islami Pakistan), while others for international audiences (for example, Taliban, Khutbah Online, and Al-Muhajiroun). They presented a selection of recorded sermons to be downloaded.

With the present technological limitations, to download a sermon is time consuming since the file is huge. In the future, "when technology (including bandwidth) improves to allow a surfer to rapidly listen to and view sermons and other information "on demand"; not just through a computer, but by digital television or WAP telephone" [Gary Bunt].

RESULTS AND DISCUSSION

IT could improve the Muslim Ummah in wide areas such as Education, Social, Economic, and Political. For this research purpose it covered how IT could improve the Ummah in the field of Education. Education is

divided into Distance learning, Da'wah and Islaah, Fatwa online, Translation of Qur'an and Hadiths, Information, Islam development software, Ijtihad, and Sermons.

Firstly, IT made possible to conduct distance learning with video conferencing. Thus people could get oversea education without being there physically. This way, it could save time and cost. Secondly, with IT, it is possible to make da'wah and islaah. Da'wah is to invite others to learn about Islam, while islaah is to improve one practices, and knowledge of Islam. Moreover, one of IT products is Internet. It is possible now to get fatwa online and advices from scholars. One example is Islam Online where people all over the world seek scholars' advices to their problems.

Lastly, the advancement of Internet, CD ROMs, and software made possible for Qur'an and hadiths to be translated into many languages, to get the latest information such as news, to adopt cyber mosque, to make ijtihad, which is decision-making, and sermons or khutbah. Software produced by Harf Information Technology Company provides people such as to recite and learn Qur'an, to know the Qibla direction, Islamic calendar, calculator, prayer time, and more.

CONCLUSION

In conclusion, IT leads the improvement of the Ummah through Education. People all over the world could gain knowledge and information about Islam through print media, audio, video, electronic, and Internet. Education is divided into Distance learning, Da'wah and Islaah, Fatwa online, Translation of Qur'an and Hadiths, Information, Islam development software, Ijtihad, and Sermons.

In the holy Qur'an cited, "And spend of your substance in the cause of Allah, and make not your own hands contribute to (your) destruction: but do good, for Allah loveth those who do good" [Surah al-Baqarah: 195].

REFERENCES

"Education", New Straits Times Press (Malaysia) Bhd., Available at: http://nie.nst.com.my/

"Oxford Advance Learner's Dictionary", Oxford University Press, Available at: http://www1.oup.co.uk/elt/oald/

Abdullah Al-Wassiti (October-November 1996), "Nidaul Islam: Islamic Resources & Activities on the Internet", Available at: http://www.islam.org.au

Abdullah Yusuf Ali (1998-2002), "The Holy Quran: Text and Translation", The Sabr Foundation, Available at: http://www.islam101.com/quran/quranYusuf/quranYusuf.html

Agboola, Kayode A (July 2000), "The Internet as Channels Religious Communication", International Islamic University Malaysia.

Ali Mazrui, and Alamin Mazrui (2001), "The Digital Revolution and the New Reformation", Harvard International Review; Cambridge, Available at: http://www.library.cornell.edu/colldev/mideast/mazruis.htm

Babak Rahimi (2003), "The Rise of Cyber Democracy in Revolutionary Iran", Paper delivered at the ISA Conference, Brisbane, Australia.

Blake Corinne (1998), "The Journal for Multi Media History", Teaching Islamic Civilization with Information Technology, Available at: http://www.albany.edu

Brian Kahin, Charles Nesson "Borders in Cyberspace: Information Policy and the Global Information Infrastructure", Cambridge, Mass.: MIT Press.

Dr. Ahmed Iskanderani (2001), "Information Systems & Islam", Conference on "Information Systems & Islam" held jointly by IIUM and IRT in Kuala Lumpur, Malaysia, Available at: http://www.iiu.edu.my/isi2001/paper.htm

Dr. Algar (2000-2003), "Online Islamic Courses", Al-Islam.org, Available at: www.al-islam.org/help/onlinecourses.html

Dr. Ibrahim B. Syed (2001), "X International Islamic Free University", Islam For Today, Available at: http://www.islamfortoday.com/syed04.htm

Fakhre Alam (2000), "Challenge of Modernity", Delhi University, Available at: http://www.milligazette.com

Fakhrudin A. Daghestani, Subhi A. Qasem (1990), "New Technologies and Development of the Muslim World", The Islamic Academy of Sciences.

H Bunt, Gary (2000), "The Islamic Internet Souq", Q-News, No. 325, Available at: http://www.flwi.rug.ac.be/cie/bunt2.htm

H Bunt, Gary (2000), "Virtually Islamic: Computer-Mediated Communication and Cyber-Islamic Environments", Cardiff: University of Wales Press, Available at: http://www.islam21.net

Harf Information Technology (2002), Available at: www.harf.com

Haroon Cambell, "Alienation Of Humanity In The Age Of Technology", Islam Online, Washington DC, Available at: http://www.islamonline.net

Harun Yahya (1999-2003), "Making Islam A Means Prosperity", Available at: http://www.islamonline.net/iol-english/dowalia/techng-2-2-2000/techng2.asp

Huma Ahmad (1995-2003), "Muslims on the Internet: the Good, the Bad...the Ugly", Jannah.org, Available at: http://www.jannah.org/articles/internet.html

Islam Online, "Can Muslim Use the Comdex Computer Conference to Upgrade Their System?", Washington DC, Available at: http://www.islamonline.net/iol-english/dowalia/techng-17-11/techng2.asp

J.A.Johnson (2002), "Computers: Tools for an Information Age", 7th edition, Prentice Hall PTR.

Jens Mortensen (November 25, 2002), "Red Rover", TIME, Available at: www.fido.jpl.nasa.gov

Jon W. Anderson (5-8 June 2002), "Transnational Civil Society, Institution-Building, and IT: Reflections from the Middle East", NMIT Working Papers, Available at: http://nmit.georgetown.edu/papers/transnatcs.htm

Jon W.Anderson (2000), "Muslim Networks, Muslim Selves in Cyberspace: Islam in the Post-Modern Public Sphere", Catholic University of America, Available at: http://nmit.georgetown.edu

Justin Sutcliffe (Dec 3, 2002 / Jan 6, 2003), Newsweek.

Kadous M. Waleed (Oct-Nov 1996), "Islamic Resources & Activities on the Internet: Internet: Gimmick or Tool?", Nida'ul Islam, Available at: http://www.islam.org.au

Kenneth C. Laudon, Carol Guercio Traver, and Jane Price Laudon (1995), "Information Technology (Concepts and Issues)", South-Western Educational Publishing.

Louis Fried (1995), "Managing Information Technology In Turbulent Times", Wiley Europe.

M.A.R. Fareed (November 2000), "Web Exclusive Interview: Muslims 100 Years Behind in IT Revolution", Q-News, Available at: http://www.muslimindia.com/akhtar.ht

Michele Zanini and Sean J.A.Edwards (2001), "The Networking of Terror in the Information Age", Networks and Newarks: The Future of Terror, Crime, and Militancy, Rand Corporation.

Mohd. Ridzwan Md. Iman (6th June 2002), "Keganasan siber - Haruskah Malaysia berpaksikan pendekatan Barat?", Utusan Malaysia, Available at: www.niser.org.my/news/2002_06_06_01.html

Richard Heeks (2002), "Information Systems and Developing Countries: Failure, Success and Local Improvisations", The Information Society an International Journal, Available at: http://www.slis.indiana.edu/TIS/abstracts/ab18-2/heeks.html

Rob Kling (2002), "Science and Engineering Indicators 2002", National Science Foundation, Division of Science Resources Statistics, Available at: http://www.nsf.gov/sbe/srs/seind02/toc.htm

Rogerson, Prof. Simon, and M.M.Begg (August 1999), "Islam, ICT and Computer Professional", IMIS Journal, Available at: http://www.ccsr.cse.dmu.ac.uk

S.M Mohd Idris (1982), "Appropriate Technology, Culture and Lifestyle in Development".

Shaikh Mohd Saifuddeen Mohd Salleh (2002), "IkimView: Strive for home-grown technology", Available at: http://www.emedia.com.my/Current_News/NST/Saturday/Columns/20030524082037/Article/

Stephen P. Robbins, and Robbins Coulter (2002), "Management", 7th edition, Prentice Hall.

Susan Raab (November 25, 2002), "Shop Around The Clock", TIME, Available at: www.shop2000online.com

Talero, E. (1997), "National Information Infrastructure in Developing Economies" in B. Kahin and E.J. Wilson III (ed), National Information Infrastructure Initiatives: Vision and Policy Design, MIT Press.

Tavis Adibudeen, "Material and Intellectual Globalization", Available at: http://www.1ummah.org/archive/msg00048.html

Timothy J. O'Leary and Linda I. O'Leary (2002), "Computing Essentials", McGraw-Hill.

Toffler, A (1991), "The Third Wave", Bantam Books.

Unknown Author (1998-2002), "The Straight Way", Available at: www.thestraightway.com

Unknown Author (11th June, 1999), "Information Technology for Sustainable Development", Paper presented in the Round Table, Available at: http://www.teriin.org/discuss/environ/itsust.htm

Unknown Author (2001), "Proposal for the Establishment of the Majma' al-Bahrayn", Institute for the Preservation of Traditional Islamic Scholarship, Available at: http://islamic-world.net/papers/majma.htm

Unknown Author (June 29, 2000), Malaysian Leader Urges Muslim Nations to Embrace Technology or Lose Out in the Long Run, Jordan Times, Available at: http://www.jordanembassyus.org/06292000003.htm

Unknown Author, "Islamic World Website Plan", Available at: http://islamic-world.net/papers/IslamicPlan.doc

Unknown Author, "Vital Relevance of Science and Technology To The Muslim Ummah", For The International Islamic Forum for Science, Technology, and Human Resources Development, Available at: www.iiftihar.or.id/aboutus/mission.htm

Yaacov J. Katz, Daniel Millin and Baruch Offir (March 1996), "The Impact of Information Technology - From Practice to Curriculum", The Dual Role of Computers in Education: Problem Generators and Problem Solvers Proceedings of the International Working Conference, page 168-179, London: Chapman and Hall.

APPENDICES
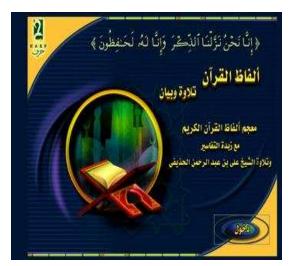
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Al Hilal (Wallet-Size Digital Qiblah Compass, Prayer Times, Calendar, and Calculator) w/ Belt Clip

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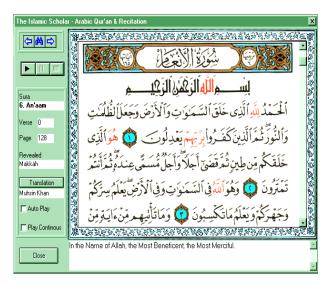
Al-MUShaf (for Desktop Publishing)

This is video payer presentation from World Wide Web (source of multimedia material).

The Islamic Scholar Software CD-ROM V3.0.

Software and Innovation: Analysis of the Task-Technology Fit Theory and Small Business as End User of Accounting Software Application

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ABSTRACT

This paper attempts to explore the usage of the accounting software packages for small business application from the perspectives of the end user. The ultimate objective of this paper is to investigate the data entry task, in which constitutes a higher proportion of usage of the accounting software packages targeted for small business. Within the Theory of Technology-Task Fit (TTF), this paper raises an argument that the embedded design of software navigation for data entry task will affect the quality of the task performance. Further, this will contribute to the quality of user experience. Based on the finding of the selected software, this research proposes an innovative way of embedded design of software navigation for the data entry has to be one of the importance attributes for small business decision-making adoptions of the accounting software packages. And for the entrepreneurs of the accounting software packages, an innovative way of designing the software navigation for data entry can be an important determinant to differentiate their products quality with the competitors. The entrepreneurs or the software creators of the accounting software packages thus should not neglect the innovation part of designing the software navigation for the data entry tasks.

INTRODUCTION

Computing application has become an integral part of the daily business operations. For small business, one of the motivators for adoption is the ability of the computing application in handling the business financial and accounting transactions. Specifically, the accounting software or system package is useful and perceived as importance by small business for the needs to shift from the manual process of recording the financial or the accounting transactions to a more systematic, automated and better approach towards record keeping and management. Small business as end user of the computing application nowadays are becoming more sensitive and demanding in the process of acquiring the accounting software packages for business used. Griese and Kurpicz (1985) in their survey reported that the user convenience of the software, software flexibility and software performance are the three most frequently features mentioned by the small medium business as part of the criteria in their decision making process of purchasing data processing system. Chau (1995), in examining the factors that influence small business in purchasing software package reported differences of views in software selection between the business owner and the managers. For instance, the owners viewed software technicality much more importance than the non-technical side in comparison to the managers. The managers considered the price and the popularity among the most important criteria, while the owners considered those attributes as least important. Further, Nazem (1990) found that the majority of small business opted for off-the-shelf software packages and they are heavily utilized the software standard modules such as General Ledger (GL), Account Payable (AP), Account Receivable (AR) and Payroll Applications. Interestingly, their study also indicated that small business who used off-the-shelf package do not appear to be overly emphasized on the security. Ismail et al (2001) also found heavy utilizations of GL, AP, AR and Payroll in their survey on the northern region of Peninsular Malaysia among the SMEs. The majority (52.8%) of the respondents used combination of manual and computerized accounting systems, while fully computerized systems used accounted only for 33.3%. In term of years of adoption, none of the respondent adopts the software more than 10 years. And the five highest reported problems as follows: inadequate skills/experience; getting employee trained; poor vendor support; the underestimated effort required for system implementation; and poor performance of software

Up-to-date, regardless of the high popularity of the accounting software packages adoption, very few in the academic literature have developed curiosity towards the usage of this software to support the small business operations. This paper thus attempts to explore the usage of the accounting software packages for small business application from the perspectives of the end user. The ultimate objective of this paper is to investigate the data entry task, in which constitutes a higher proportion of usage of the accounting software packages targeted for small business. The quality of data entry undeniably is fundamental towards derivation of better and useful information for business decision-making. Within the Theory of Technology-Task Fit (TTF), this paper raises

an argument that the embedded design of software navigation for data entry tasks will affect the quality of the task performance. Further, this will contribute to the quality of user experience and will affect their perception towards the quality of the software. This research proposes an innovative way of embedded design of software navigation for the data entry has to be one of the importance attributes for small business decision-making adoptions of the accounting software packages. And for the entrepreneurs of the accounting software packages, an innovative way of designing the software navigation for data entry can be an important determinant to differentiate their products quality with the competitors. The entrepreneurs or the software creators of the accounting software packages thus should not neglect the innovation part of designing the software navigation for the data entry tasks.

This paper is organized as follows. Section II focuses on the review of the Task Technology Fit (TTF) theory as a theoretical basis to support the research argument. In addition, it also includes the literature overview on the software technology and the nature of the business as well as the data entry task in relation to the users' performance and implications. Further, Section III explains the research methodology and analysis of the sample software. Section IV discusses the finding and concludes the study.

LITERATURE REVIEW

The Task-Technology Fit (TTF) Theory

Goodhue (1995) proposed the Task-Technology Fit (TTF) model as a mechanism of user evaluations on the information system success. TTF is "the extent that technology functionality matches task requirements and individual abilities" (Goodhue, 1995:1829). The basis of the TTF model is that the individual user will give higher evaluation on the utilized information system (IS) if the technological or system characteristics fits or matches the nature of the carried task. In addition, the model argued that the user capabilities and skills will also affect the IS evaluation performance. Four hypotheses were empirically tested in the study. The findings support the propositions that user evaluations of TTF are affected by the characteristics of the technology, the characteristics of the task as well as the individual's skills and abilities. Within the technological or system characteristics, Goodhue (1995) proposed that the integrated, common systems of IS, in which reducing the user's confusion, increasing the user understandability, locatability, accessibility and compatibility will lead the user to give higher evaluation performance. Besides, the user will also give higher evaluation performance with easy access of workstation penetration, high level of assistance ratio and the availability of the decentralized unit of assistance to help users in using the system. The task characteristics range from the variety and difficulty of the task, the interdependence of the task and "hands-on" task. Goodhue (1995) argued that, the user who are involved in variety and difficult tasks, and the tasks are interdependent with other organizational units, and to complete the tasks, the user is required to use certain technical skills or techniques (i.e. the use if third or fourth generation language) to interact with the system will lead the user to give lower evaluation performance. User evaluations of TTF also found to have affected by the interaction between the task, the technology and the individual characteristics.

Goodhue and Thompson (1995:213) have extended TTF view within the argument that "for an information technology to have a positive impact on individual performance, the technology must be utilized, and the technology must be good fit with the tasks it supports". The model called the Technology-to-Performance Chain (TPC) is derived the proposed TTF earlier in Goodhue (1995) as the predictor of performance, with the inclusion of user attitudes and beliefs as the predictor of utilization. Goodhue and Thompson (1995) based on the existing theories on users' attitude and behavior (see Goodhue, 1995 and Goodhue and Thompson, 1995 for details) proposed that the occurrence of the mandatory and non-mandatory utilization of the system affect the user's belief and attitudes, and further will affect the user's performance impact. Performance impact is related to the issues of achievement of tasks with a degree of changes in term of variables such as task efficiency and effectiveness, and quality gain. In other words, the significant improvement in the task productivity signifies higher performance impact on using the system, and vice versa. The findings reveal that the technological proposed characteristics of the technology, although not all characteristics do affect TTF. And for the tasks and user interactions, the study found differences contributed by the different job levels (i.e. compatibility and ease of getting authorization). Overall, the finding moderately supports that the task and the technology does affect users in evaluating TTF. However, the study failed to demonstrate that TTF as a predictor of utilization. They argued few possibilities to explain the failure. The explanation include the exclusion of the user's duration and frequency usage of the system, the domination of other influences on the user's attitudes and behavior such as social norms, habit etc as compared to TTF in utilizing the technology, and the limitation of the research design in which the variation of IS characteristics used must be taken into consideration. The findings further reveal that the use of TTF and utilization together appears to perform better in predicting performance impact, rather than using the utilization alone.

Software Technology, Data Entry Task and Users

"Software-nothing but pure knowledge in codified form-largely drives and enables today's economy" (Hoch et al, 1996:6). Software is a production based on the continuous innovation, creativity and efforts either from the entrepreneurs or the software creators. Quinn et al (1996) argues that software is an essential component of all aspects of innovations in business. They propose the significance role of software that ranges from the basic and applied research to the development area, manufacturing, organizational learning and other critical areas that are significance towards the promotion of innovation in business. A high quality software requires creators to have a specialized domain of knowledge, wide and diverse technical skills and high-level of user-sensitivity. Carmel and Sawyer (1998) have observed differences between the packaged software firms and the custom IS development firms. Packaged software firms design and produce software products that are targeted for mass market. The custom IS development firms build custom IS systems based on-ongoing contract or on consultation basis. Thus, the IS custom firm is much more people and process oriented, whereas the packaged software firm is more product and market oriented. Based on the industry, development, team, and cultural milieu as dimensions for analysis, Carmel and Sawyer (1998) concluded few distinct attributes of the packaged software firms in contrast to the custom IS firms on their study. Due to the purpose of mass market, the packaged software business is based on profit and market share as the indicator for success, while the custom IS business uses user satisfaction and acceptance of the system as success indicator. For the packaged software firms, the development structure is based on line positions, the design and development process is integrated, and coordination play roles to control or manage the design. User is normally not involved in the development of the software. The packaged software firm also tends to be highly entrepreneurial and individualistic. Because of the business culture that emphasize on highly entrepreneurial and individualistic, the packaged software team tends to be self-managed, motivated and willing to work long hours. The team also may have multiple involvements in the software development life cycle and sharing vision for their product.

The packaged software is attractive to small business because they are affordable, and easy to install and use due to the less requirement of technical expertise (Cragg and King, 1993). The characteristics of the accounting software packages within the category of the low end, the mid-range and the high-end packages proposed by Tavakolian (1995) has changed and less applicable in today's market due to the fast innovation in the software technology. For instance the mid-range accounting system has been observed to slowly moving towards the Web adaptation for e-commerce support (Davis, 2000). Dhaliwal and Konsyuki (1980) prescribed technical considerations to ensure the integrity of the input data in the computerized accounting systems. The emphasis to ensure the data integrity must be given at the initial stage of the activity session when operators interact with the system. Specifically the activities such as converting and transmitting data from source documents to the production of turnaround documents and other form of analysis for further usage in business transactions. Input validations from the software embedded modules or techniques as part of data integrity control mechanisms can range from the validity tests, completeness tests, logical tests, limit tests, self checking digits and control totals (refer to Dhaliwal and Konsyuki, 1980 for details). One interesting aspect highlighted by Dhaliwal and Konsyuki (1980) is the form of job designation that contradicts with the nature of the software (i.e. the authorization applies to only one role, but job made two roles). In addition, the data entry activities can be the typical form of errors that affect the integrity of data.

Data entry task is fundamental towards ensuring the quality of data in the system. Jinks et al (2003) for instance presents their analysis on the data entry task in the field of healthcare. Specifically the activities of data entry task of using Teleform. Teleform is a computer-assisted data entry system to support the clerks' data entry job. The experience and skills of the clerks as users are proven to be significant in the error reduction of the data entry. In addition, the characteristic of the technology such as the user-friendliness of the Teleform also contributes to the data entry task efficiency. Heavily involved in massive data entry activities can also led to physical and psychological problems. The visual fatigue, musculoskeletal disorders such as low back pain, carpal tunnel syndrome (CTS) and job stress are the common problems experienced by the computer users including the data entry clerk/operator/user. Balci and Aghazadeh (2004) present their analysis that frequent work-rest schedule is significant towards minimizing the effects on discomfort, performance, and muscular load levels. The embedded software navigation design thus can play significant roles in reducing possible health problems for the user that involves in massive data entry task activities.

RESEARCH METHODOLOGY AND ANALYSIS

Two accounting software packages have been acquired from the local market. For the purpose of this study, the analysis and discussion will refer the Software 1 as S1 and the Software 2 as S2. The price of these software ranges from MYR1500.00 to MYR2500.00 and both software are widely available in the local market. Generally, the embedded modules application (i.e. AR, AP, GL, Invoicing etc) in both software are targeted for

the small business financial or accounting operations. For the purpose of this study, two partial extractions of the software design for data entry presented in the form of column and row (Table 1 for S1, and Table 4 for S2). This is one of the typical forms of input design for the data entry. The method will enable the analysis of the embedded navigation development approach for S1 and S2 towards the task completion of the data entry. The data entry task is partially based on the complete activities of *the task scenario of new sales order for an item/product preparation for new customer* using the software. The detail analysis and explanation only reflect one routine of navigation for data entry with the input screen. In reality, users' routines of navigation for data entry with the input screen are varied and difficult to quantify. The use of one routine is sufficient for the purpose of this research study that is to raise an argument that the embedded design of navigation for data entry task contributes to the quality of the task performance. As proposed by the TTF theory, the degree of fit is determined by the technology characteristics and the task characteristics. Thus the embedded design of navigation of S1 and S2 as presented through the extraction of partial tasks of data entry will provide good observation towards the effect of the navigation design techniques as one characteristic of the software technology that have direct contribution to the quality of task performance.

Analysis of the Software 1 (S1)

Table 1: Partial Extraction of Data Entry Task of S1

COL1 (Quantity)	COL2 (Product Nc)	COL3 (Descriptior)	COL4 (Acc Nc.)	COL5 (Amount)	COL6 (Job)	COL7 (Tax)

There are seven columns for the data entry task. The observed generic navigation techniques applies to these seven columns include the common Mouse Operation and keystroke such as Tab Key, Shift Tab Key, Escape Key and Control Tab Key (see Table 2). The availability of Mouse Operation helps to improve the users' performance for data entry task. The use of Escape Key for exiting the sales data entry screen however can cause users' frustration because no warning or reminder dialog box to users to save their data entry works before exiting the screen. If the user has accidentally pressed the Escape Key, and the user does not save the current work yet, than the user has to start the task all over again. This undeniably can affect the quality of the task performance.

Table 2: Generic Navigation Techniques Apply to All Columns of S1

Navigation Technique	Role in Data Entry Task
Mouse Operations	Advance cursor to begin data entry
	To move to the previous input box
	To move to the next input box
	To move to the next row
Tab Key	Advance cursor to begin data entry
	To move to the next input box
Shift Tab Key	Advance cursor to begin data entry
	To move to the previous input box
Escape Key	Automatic exit the sales input screen to the main screen with no interaction to ask if users want to save the record or not
Control Tab Key	To go to the main screen

S1 also contains embedded navigation techniques apply to the specific columns (see Table 3). For instance, the use of Spacebar Key to trigger calculator tool for Column 1, Column 4, Column 5 and Column 6. The Spacebar Key to trigger utility such as the calculator tool is not a typical representation of navigation key technique for the accounting software packages. The user thus is expecting to know in advance through manual or online help that this utility available to be used. The used of Enter Key is also not consistent in the navigation design. In Column 3 for instance, the user cannot use the Enter Key to move to the next input box as other columns. The inconsistent use of Arrow Up Key and Arrow Down Key is also apparent in the S1 navigation design. The use of the Arrow Down Key in Column 2 for instance will navigate to the next row of the same column for data entry and not to the next input box as applies to rest of the columns. In Column 3, the Arrow Up Key and Arrow Down Key are not available as navigation techniques.

Table 3: Specific Navigation Techniques Apply to Specific Columns of S1

Columns	Navigation Technique	Role in Data Entry Task
Column 1 (Quantity) Function: To input the quantity that has been ordered by the clients	1. Enter Key	Advance cursor to begin data entry To move to the next row
	2. Arrow Up Key	To move to the previous input box Advance cursor to begin data entry
	3. Arrow Down Key	To move to the next row Advance cursor to begin data entry
	4. Space Bar Key	To trigger calculator tool
	Navigation Technique	**Role in Data Entry Task**
Column 2 (Product/Item No) Function: To select/input the product/item number	1. Mouse Operations	To trigger the item number list for selection To click on the command button from the list box to proceed
	2. Enter Key	To trigger the item number list for selection To move to the next input box
	3. Arrow Up Key	To move to the previous input box Advance cursor to begin data entry
	4. Arrow Down Key	To move to the next row in the same column Advance cursor to begin data entry
Column 3 (Description) Function: To input the description of the product	**Navigation Technique**	**Role in Data Entry Task**
	1. Enter Key	Advance cursor to begin data entry To move to the next line for data entry
	Navigation Technique	**Role in Data Entry Task**
Column 4 (Price) Function: To input the price of the product	1. Enter Key	To move to the next row
	2. Arrow Up Key	To move to the previous input box
	3. Arrow Down Key	To move to the next input box
	4. Space Bar Key	To trigger calculator tool
	Navigation Technique	**Role in Data Entry Task**
Column 5(Discount Rate) Function: To input the discount rate if applies	1. Enter Key	To move to the next row
	2. Arrow Up Key	To move to the previous input box
	3. Arrow Down Key	To move to the next input box
	4. Space Bar Key	To trigger calculator tool
	Navigation Technique	**Role in Data Entry**
Column 6(Total) Function: Auto calculates the total based on the price, unit and discount rate if applies. Users can change the total with no warning message if errors occur.	1. Enter Key	To move to the next row
	2. Arrow Up Key	To move to the previous input box
	3. Arrow Down Key	To move to the next input box
	4. Space Bar Key	To trigger calculator tool
	Navigation Technique	**Role in Data Entry**
Column 7(Job) Function: To input the job type that involve	1. Enter Key	To move to the next row
	2. Tab Key	To trigger the item number list for selection
	3. Arrow Up Key	To move to the previous input box
	4. Arrow Down Key	To move to the next input box
	Navigation Technique	**Role in Data Entry**
Column 8(Tax) Function: To input the job type that involve	1. Enter Key	To move to the next row
	2. Arrow Up Key	To move to the previous input box
	3. Arrow Down Key	To move to the next input box
	4. Space Bar Key	To trigger calculator tool

Analysis of the Software 2 (S2)

Table 4: Partial Extraction of Data Entry Task of S2

COL1 (Item/Product	COL2 (Quantity)	COL3 (B/O)	COL4 (Unit)	COL5 (Description)	COL6 (Price)	COL7 (Amount)	COL8 (Tax)	COL9 (ACCOUNT)

There are nine columns for the data entry task. The observed generic navigation techniques apply to these columns are the Mouse Operations and the common keystroke such as Tab Key, Shift Tab Key, Control Tab Key, Arrow Up Key and Arrow Down Key (see Table 5). The availability of Mouse Operations helps to improve the users' performance for the data entry task. S2 utilize the Arrow Up Key and Arrow Down Key consistently to signify navigation to the upper and lower line for data entry. S2 improvised the quality of user experience for data entry task by maximizing the number of common navigation keys in comparison to the S1.

Table 5: Generic Navigation Techniques Apply to All Columns of S2

Navigation Technique	Role in Data Entry Task
Mouse Operations	Advance cursor to begin data entry
	To move to the previous input box
	To move to the next input box
	To move to the next row
Tab Key	Advance cursor to begin data entry
	To move to the next input box
Shift Tab Key	Advance cursor to begin data entry
	To move to the previous input box
Control Tab Key	Advance cursor to begin data entry
	To move to the previous input box
Arrow Up Key	To move to the next line (upper) within the same column
	Advance cursor to begin data entry
Arrow Down Key	To move to the next line (lower) within the same column
	Advance cursor to begin data entry

Because of the availability of the generic keys, only a small number of columns embedded with specific navigation techniques. All of these techniques (i.e. Column 1, Column 4, Column 8 and Column 9) are consistently design for specific navigation. Besides, the visible cues for mouse clicking provide better assistance for the users.

Table 6: Specific Navigation Techniques Apply to Specific Columns of S2

	Navigation Technique	Role in Data Entry Task
Column 1 (Item/Product Number) Function: To input the item/product number that has been ordered by the clients	1. Mouse Operations	To trigger the item/product number list for selection. Icon is visible for mouse clicking. To click on the command button from the list box to proceed.
	2. Enter Key	To trigger the item/product number list for selection. To move to the next input box
Column 2 (Quantity) Function: To input the item/product number that has been ordered by the clients	None	
Column 3 (Back Order) Function: To input the back order quantity if applies	None	

	Navigation Technique	Role in Data Entry Task
Column 4 (Category of Unit)) Function: To input the category of unit applies to the product	1. Mouse Operations	To trigger the unit category list for selection. Icon is visible for mouse clicking. To click on the command button from the list box to proceed.
	2. Enter Key	To trigger the unit category list for selection. To move to the next input box
Column 5 (Description) Function: To input the product description	None	
Column 6 (Price) Function: To input the product price	None	
Column 7 (Total Amount) Function: Auto calculates the total based on the price and unit. Users can change the total amount and column price is auto adjusted.	None	
	Navigation Technique	**Role in Data Entry Task**
Column 8 (Tax) Function: To input the tax category	1. Mouse Operations	To trigger the tax list for selection. Icon is visible for mouse clicking. To click on the command button from the list box to proceed.
	2. Enter Key	To trigger the tax list for selection. To move to the next input box
	Navigation Technique	**Role in Data Entry Task**
Column 9 (Account) Function: To input the account category	3. Mouse Operations	To trigger the account list for selection. Icon is visible for mouse clicking. To click on the command button from the list box to proceed.
	4. Enter Key	To trigger the account list for selection. To move to the next input box

DISCUSSION AND CONCLUSION

In conceptualizing the TTF on the specific domain of the accounting software application, the data entry tasks and the characteristics of the embedded design of software navigation will determine the degree of fit. The degree of fit determines the task performance of the users in completing the task using the software technology. Within the context of this study, the data entry task is an independent task and routine in nature. The speed of data entry, in addition to the quality task of the data entry performed by the users will determine the quality data that is being fed into the system. As demonstrated by few researchers, users' experience, attitudes and skills contributes to the quality of the data entry task. Thus ideally, the embedded design of software navigation must support the nature of the data entry task. The embedded design of navigation of the accounting software packages thus must contain ability to enhance the speed quality of the data entry, in addition to the support mechanisms that can lead to the achievement of zero data entry errors.

As presented in the previous section, there are some apparent differences between S1 and S2 in the approach design of the software navigation. S2 approach is more systematic, thus the embedded navigation techniques are consistent and predictable to the user throughout the process of completing the data entry task. In addition, the visible cues and the appropriate selection of keystroke for navigation will enhance the quality of the user experience. S1, with the inconsistent navigation design will impose difficulty on users to complete the data entry task. Within this simple analysis, users' performance speed will be negatively affected due to this inconsistency. Lacking of the visible cues to signify the correct navigation technique (i.e. visible icon for mouse clicking) in addition to the availability of Escape Key to automatically exit from the current input screen without warning can also affect the user quality experience in using the system. Further, if users accidentally changed the data of the total amount (Column 6), the new changes will not affect the set price. Here, the calculation error obviously occurs. In the other hand, if any changes in S2 pertaining to the total amount (Column 7) either accidentally or intentionally performed by the users, the price is auto adjusted to reflect the current change of the total amount. As demonstrated by the analysis, one can easily stipulate that S2 navigation design is much more sensitive and

fully reflects on the technological requirement of the data entry for optimum level of performance as compared to S1.

This research has been able to demonstrate how innovation of the creator can play significant role towards the quality of the task performance of the user. In the production of the accounting software, the entrepreneur or the creator must not ignore the innovative part of designing the navigation techniques in order to ensure the produced software can be efficiently adopted by the end users. Based on the application of the TTF Theory, this study has highlighted the importance of the innovative development of the navigation technique on the software to be treated as one of the differentiator qualities of the software in making comparison to the other competitors in the industry. For the potential adopters (i.e. small business owners/managers) of the accounting software packages, the innovative navigation design of the software shall be one of the attributes of the decision-making criteria for adoption if the nature of the tasks is dealing with massive and frequent data entry.

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REFERENCES

Balci, R., and Aghazadeh, F. (2004), Effects of exercise breaks on performance, muscular load and perceived discomfort in data and cognitive tasks, *Computers & Industrial Engineering,* 46:399-411.

Carmel, E., and Sawyer, S. (1998), Packaged Software Development Teams: What Makes Them Different, *Information Technology & People,* 11(1):7-19.

Chau, P.Y.K. (1995), Factors used in the selection of packaged software in small businesses: Views of owners and managers, *Information & Management,* 29:71-78.

Cragg, P.B., and King, M. (March 1993), Small-Firm Computing: Motivators and Inhibitors, *MIS Quarterly,* 47-60.

Dhaliwal, D.S and Konsyuski, B.R. (1980), Data Integrity Considerations in Computer Based Accounting Systems,

Goodhue, D.L. (1995), Understanding User Evaluations of Information Systems, Management Science, 41(12):1827-1884.

Goodhue, D.L. and Thompson, R.L. (June 1995), Task-Technology Fit and Individual Performance, *MIS Quarterly*, 213-236.

Griese. J., and Kurpicz, R. (1985), Investigating the Buying Process for the Introduction of Data Processing in Small and Medium-sized firms, *Information & Management,* 8:41-51.

Hoch, D.J., Roeding, C.R., Purkert, G., Lindner, S.K., and Muller, R. (1996), Secrets of Software Success: Management Insights from 100 Software Firms around the World, Boston, MA: Harvard Business School Press.

Ismail, N.A., Abdullah, S.N., and Tayib, M. (July 2001), The Extent of IT Use in Accounting Among SMIs, *Akauntan Nasional,* 44-47.

Jinks, C., Jordan, K., and Croft, P. (2003), Evaluation of a computer-assisted data entry procedure (including Teleform) for large-scale mailed surveys, *Computers in Biology and Medicine*, 33:425-437.

Nazem, S.M. (1990), Sources of software and levels of satisfaction for small business computer applications, *Information & Management,* 19:95-100.

Quinn, J.A., Baruch, J.J., and Zien, K.A. (1996), Software-Based Innovation, *The McKinsey Quarterly,* 4:94-119.

Tavakolian, H. (1995), PC-based financial software: emerging options, *Industrial Management and Data Systems*, 95(10):19-24.

Attitudinal Factors Contributing to Organizational Commitment among Employees in an East Malaysian City

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ABSTRACT

Organizational commitment is often associated with job effectiveness, level of satisfaction, and the employees' intention to quit or stay with their organizations. Individuals with higher level of commitment to the organization are more likely to put in efforts to add value to the organization. They would be more willing to contribute their ideas, co-operate with their superiors, follow instructions and directives from the management, and engage themselves in activities that they perceived as beneficial to the organization as a whole. As such, employees with strong organizational commitment are definitely desirable, and subjects related to factors contributing to organizational commitment would inevitably be of interest to employers and managers. In this study, it is hypothesized that employees' self-efficacy, job involvement, and perceived organizational support would be among the factors contributing to organizational commitment. Standardized scales developed to measure these factors were adopted to collect data from a total of 95 employees from six organizations in various industries in Kota Kinabalu. It is found that perceived organizational support contributed most significantly to organizational commitment. The contributions of self-efficacy and job involvement are also found to be significant, although far weaker than that of perceived organizational support.

INTRODUCTION

The Hawthorne studies taught us lessons about how the workers' attitudes and social behaviors may affect their performance and productivity. Over the years, researchers had studied various attitudinal factors that may have influenced worker productivity. Organizational commitment is one of those factors frequently examined. One significant attempt to operationalize the measure of the factor was done by Mowday, Steers, and Porter (1979). They defined organizational commitment as "…the relative strength of an individual's identification with and involvement in a particular organization" (p.226). They contended that it can be characterized by at least three related factors:

- A strong belief in and acceptance of the organization's goals and values;
- A willingness to exert considerable effort on behalf of the organization; and
- A strong desire to maintain membership in the organization.

A highly committed employee would accept the goals and values of the organization, be willing and motivated to exert high levels of energy on behalf of the organization, and would exhibit desirable employee behaviors as a part of the organization. Such characteristics in an employee would indeed make him or her valuable to any organization.

Effects of Organizational Commitment

There are some valuable research findings pertaining to the influence of organizational commitment on worker attitudes and performance. Organizational commitment was found to be associated positively with job satisfaction of employees (Glisson & Durick, 1988; Mowday et al, 1979; Porter, Crampon, & Smith, 1974; Porter, Steers, Mowday, & Boulian, 1974). In a more specific study, it was found that where there is no conflict between organizational loyalty and professional standards among a sample of accounting professionals, organizational commitment correlates positively with job satisfaction (Norris & Niebuhr, 1983).

Organizational commitment has been found to have direct and indirect effects on work performance and behaviors. Mowday, Steers, and Porter (1979) discovered positive correlation between organizational commitment and supervisor-rated work performance. In another study, organizational commitment was observed to mediate relationship of leadership behavior with job satisfaction and performance (Yousef, 2000). In addition, organizational commitment was also found to be associated with employees' attendance, turnover,

and intention to stay with or leave an organization (Mowday et al, 1979; Porter, Crampon, & Smith, 1976; Porter, Steers, Mowday, & Boulian, 1974; Steers, 1977; Stevens, Beyer, & Trice, 1978).

Predictors of Organizational Commitment

It is quite widely accepted that individual characteristics of employees are likely predictors of organizational commitment. For instance, age, gender, education, and employment tenure of employees are among the characteristics that are quite effective in predicting organizational commitment (Batesman & Strasser, 1984; Koch & Steers, 1978; Morris & Sherman, 1981; Steers, 1977; Stevens, Beyer, & Trice, 1978). However, it appears that the effects of these individual characteristics may be indirect, often mediated by other attitudinal factors (Mottaz, 1988).

In the process of ascertaining the determinants of organizational commitment, Mottaz (1988) concluded that intrinsic rewards – personal-related factors that are considered rewarding by the employees – are more powerful determinants of organizational commitment than social and organizational rewards. This pattern appeared to be consistent across different occupational groups of sample in the study. This reflects that employees' attitudinal factors have significant impact on the level of their organizational commitment.

One such factor that may affect employees' organizational commitment is their level of self-efficacy. This refers to the general feelings they have on their capability to cope with the challenges they face. Employees with higher levels of self-efficacy would be more confident with their competence at work, and more likely to exercise initiatives to add value to their organizations. Morris and Sherman (1981) found that employees with greater sense of competence tend to have higher level of organizational commitment.

Employees' job involvement appears to be associated with organizational commitment. Stevens, Beyer, and Trice (1978) reported the employees' ego involvement with their jobs have significant positive correlation with their levels of organizational commitment. In another study, organizational commitment was observed to have positive correlation with job involvement (Mowday et al., 1979).

Apart from the above factors, organization-related factors such as leadership behaviors (Batesman & Strasser, 1984; Morris & Sherman, 1981; Yousef, 2000) and the extent to which the organization is seen as dependable (Buchanan, 1974; Hrebiniak, 1974; Steers, 1977) were found to be significant predictors of organizational commitment. Employees' perceived organizational support appeared to have contributed to stronger feelings of affiliation and loyalty to the organization (Eisengerger, Fasolo, & Davis-LaMastro, 1990). Perceived organizational support of employees was found to be positively correlated with the various domains – affective, continuance, and normative – of commitment (LaMastro, 2003) and with organizational commitment specifically (Shore & Tetrick, 1991).

RATIONALE OF THE STUDY

Since the 1980s, the state government of Sabah has concerted efforts to take on the challenges brought about by a new economy. These challenges are well described by Richard and Ti (1989):

> As a developing economy with a dominant primary commodity export base, Sabah is highly sensitive to changes in the global environment. …It is becoming increasingly apparent that the industrial world has reached a plateau of growth thereby changing the market for primary products. …Sabah needs to develop a more diversified value-added economy to be better able to compete in today's global environment and thereby ensure long-term growth. (p.3)

As a response to these challenges, human resource is among one of the ingredients for growth to be put in place to enhance the state's competitiveness according to the Sabah Action Blueprint (Institute for Development Studies, 1987).

As more efforts of industrializing the state economy are in progress, the demand for human resources would definitely increase (Chua, 1999). On a statewide scale, it was reported that as at September 2002, the total number of employed persons in Sabah was approximately 1.062 million (Institute for Development Studies, 2003), comparing to 332,345 in 1980 (Richard & Ti, 1989).

In the management and development of human resource, employee attitudes and performance are major concerns of employers everywhere. As human resource management becomes one of Sabah's main ingredients for growth, there are needs to determine factors that may contribute positively to employee performance and

productivity. This study attempts to determine the factors contributing to organizational commitment, which is one factor likely to affect employee work performance – directly or indirectly (Glisson & Durick, 1988; Mowday et al, 1979; Porter et al, 1974; Porter et al, 1974; Steers, 1977; Stevens et al, 1978).

Although employees' individual characteristics may have contributed to their organizational commitment to a certain extent, such effects may have been indirect and perhaps mediated by other attitudinal factors. When advance in age, with limited educational attainment, and after working with an organization for a considerable long period of time, the employee's level of organizational commitment – especially in the continuance domain – would inevitably be higher due to the lack of alternative career options. While acknowledging that these factors could be helpful as predictors of organizational commitment, Mottaz (1988) proposed that theoretical consideration of the effects of attitudinal factors would be more relevant to further understand and explain what determines and contributes to organizational commitment.

The rationale of this study is that attitudinal factors of employees would contribute significantly to organizational commitment. The confirmation of such effects would help employers understand and explain how the level of organizational commitment of their employees is affected in order to derive human resource management strategies that would improve employee attitudes and organizational commitment, and ultimately their productivity at work.

RESEARCH HYPOTHESIS

The purpose of this study is to determine the degree to which employee attitudes contribute to their organizational commitment. Specifically, the attitudinal factors considered are self-efficacy, job involvement, and perceived organizational support. The hypothesis of this study is that

H1: Self-efficacy, job involvement, and perceived organizational support of employees will have significant effect on their levels of organizational commitment.

PROCEDURES

This study is conducted among six organizations in Kota Kinabalu from various industries – education, information and communication technology, property development, accounting and management services, and public service. These organizations employ in total about 200 employees of various ethnic backgrounds who are mostly Sabahans or permanent residents of the state of Sabah.

A survey is conducted among the employees of these organizations through their management. Survey instrument is distributed to and collected from the employees by their management. A total of about 150 forms were distributed to the operatives of the organizations – executives, officers, and those who made up the main operating core of the organizations. They were given about one week to complete the form and submit it back to their management. A total of 96 forms were collected back, making a response rate of about 64.0%. Out of the 96 forms collected, one form was only half completed and was discarded from further consideration. Thus, the number of responses considered for statistical analysis is only 95.

Subjects

The subjects of this study are employees who are among the operating workforce of six organizations in Kota Kinabalu. Responses from a total of 95 subjects were analyzed. The subjects are made up of various ethnic backgrounds – Kadazan and Dusun (22.1%), other native groups of Sabah (19.8%), and Chinese (58.1%). In terms of job tenure, 62% of the subjects had worked with their present organization for one to three years and four subjects had worked with their present organizations for more than 10 years.

SURVEY INSTRUMENT

The survey instrument for this study consists of scales to measure self-efficacy, job involvement, perceived organizational support, organizational commitment, and other factors included for pilot test of another study. It has a total of 116 Likert-scaled items on a 7-point scale (from "Strongly disagree" to "Strongly agree"). The scales to measure self-efficacy, job involvement, perceived organizational support, and organizational commitment are adopted from previous studies, and had demonstrated fairly high degree of validity and reliability.

Self-Efficacy

Self-efficacy is measured by using the 17 items in the General Self-Efficacy Scale developed by Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982). Cronbach's alpha coefficient for the scale was determined to be .86 when administered among 376 students in an introductory psychology course and demonstrated criterion validity when tested with 150 inpatients in a medical institution (Sherer et al., 1982).

Job Involvement

Job involvement is measured by using the 20 items developed by Lodhal and Kejner (1965). They defined job involvement as "…the degree to which a person's work performance affects his self-esteem" (Lodhal & Kejner, 1965, p.25), and elaborated it as

> …the internalization of values about the goodness of work or the importance of work in the worth of the person, and perhaps it thus measures the ease with which the person can be further socialized by an organization. (p.24)

According to them, job involvement is acknowledged to be a multidimensional attitude, and thus it can be scaled with adequate, but not high reliability. The 20 items for the Job Involvement scale was developed and tested through three rounds – involving 137 nurses, 70 engineers, and 46 graduate students respectively. The split-half reliability of the 20-item scale was adequate but not extremely high – ranging from .56 (for nurses) to .80 (for graduate students). Corrected by means of the Spearman-Brown formula, the split-half reliability ranges from .72 (for nurses) to .89 (for graduate students). There were sufficient evidence to establish the validity of the scale in terms of discrimination and congruence.

Perceived Organizational Support.

Perceived organizational support is the employees' perception of their organization's care and concern for their well being in general. Eisenberger, Huntington, Hutchison, and Sowa (1986) postulated that there will be agreement in the degree of support from the organization expected by employees in a wide variety of situations. Based on this hypothesis, they developed a 36-item instrument to measure perceived organizational support. These items were tested on 361 employees from nine organizations of various industries – manufacturing, finance, telecommunication, retail, legal service, education, and postal service. Factorial validity was determined by confirmatory factor analysis. The Cronbach's alpha value was found to be .97, and item-total correlations ranges from .42 to .83, with mean and median of .67 and .66 respectively. These items were often used for studies on perceived organizational support, and its factorial validity and reliability remain consistently high. In the second study reported in the same paper, Eisenberger and colleagues (1986) used 16 items from the original 36 items, yielding Cronbach's $\alpha = .93$. For this reason, these 16 items were used in the present study to measure perceived organizational support.

Organizational Commitment. The 15 items developed by Mowday, Steers, and Porter (1979) was used to measure organizational commitment. These items were tested on 2,563 employees from nine different work organizations – hospital, public agency, university, telecommunication company, etc. The responses to the questionnaire were found to be highly consistent (α ranges from .82 to .93 with a median of .90). Favorable evidence was also found for test-retest reliability for two samples over two-, three-, and four-months period ($r = .53, .63, .75$ for psychiatric technicians, and $r = .72, .62$ for retail management trainees). Evidence of validity – convergent, discrimination, and predictive – was also adequately obtained.

RESULTS

Out of about 150 survey forms distributed, 96 forms were collected back. One form was discarded because it was incomplete. The total number of responses submitted for data analysis is 95. The data was entered and sum of scores for each scale – self-efficacy, job involvement, perceived organizational support, and organizational committed – was computed. The correlation between these factors was then determined (Table 1).

Table 1: Correlation Matrix for Attitudinal Factors affecting Organizational Commitment

	Self-Efficacy	Job Involvement	Perceived Organizational Support	Organizational Commitment
Self-Efficacy	1.000	.503*	.367*	.582*
Job Involvement	.503*	1.000	.517*	.619*
Perceived Organizational Support	.367*	.517*	1.000	.724*
Organizational Commitment	.582*	.619*	.724*	1.000

* $p < .01$ (2-tailed)

It is observed that all the factors are significantly correlated with one another ($p < .01$). Specifically, self-efficacy, job involvement, and perceived organizational support have significant correlations with organizational commitment (Pearson r = .582, .619, and .724 respectively). In order to examine the extent to which these factors contribute to the variance in organizational commitment, regression analysis is performed.

Based on the correlation analysis, linear regression is performed with organizational commitment as the dependent variable. Having the highest correlation with organizational commitment, perceived organizational support is entered first, followed by job involvement, and finally self-efficacy. The results yielded are displayed in Table 2.

Table 2 : Attitudinal Factors Contributing to Organizational Commitment

Predictors	R	R^2	ΔR^2	Sig. F Change
Perceived Organizational Support	.724	.524	.524	.000
Job Involvement	.841	.708	.028	.008
Self-Efficacy	.824	.679	.155	.000

Dependent Variable: Organizational Commitment

All the predictors contribute significantly to the variance in organizational commitment. Perceived organizational support contributes the highest variance (ΔR^2 = .524, p<.01) as expected. However, despite of having higher correlation with organizational commitment, job involvement (ΔR^2 = .028, p<.01) contributes less than self-efficacy (ΔR^2 = .155, p<.01) to the variance of organizational commitment.

DISCUSSION

Although employee characteristics such as age and job tenure could be good predictors of organizational commitment, this study focused on attitudinal factors of employees. It is the rationale of this study that the understanding of such effects would help employers and managers to predict, manage, and control the behaviors of their employees more effectively, especially in the efforts of promoting organizational commitment.

Results from the data analysis yielded significant evidence that perceived organizational support, job involvement, and self-efficacy of the subjects would contribute to the variance in their organizational commitment. Furthermore, perceived organizational support appeared to be the more dominant factor among the three in consideration. This suggests that employees who perceive their organizations as supportive would be more likely to be committed to the organization. This finding is in agreement with several previous studies, which had indicated that, perceived organizational support is positively associated with various aspects of organizational commitment (Eisengerger, Fasolo, & Davis-LaMastro, 1990; LaMastro, 2003; Shore & Tetrick, 1991).

The significance of perceived organizational support as a predictor of organizational commitment of employees (ΔR^2 = .524, p<.01) deserves serious attention from employers and managers. This would imply that organizations wanting to promote organizational commitment should place employees' welfare among the top agenda pertaining to human resource management and development strategies. Some strategies to improve perceived organizational support among employees include involvement of employees in policy and operational planning, proper assessment and understanding of employees' needs, design and formulation of policies based on employees' feedback, and so on.

It is found that self-efficacy of employees contribute more significantly to their organizational commitment (ΔR^2 = .155, p<.01) than job involvement (ΔR^2 = .028, p<.01). It seems that those who are highly involvement in their job are less likely to be committed to their organizations comparing to those with high self-efficacy.

They may love their jobs, but that may not necessarily mean that they are loyal and devoted to their organizations. On the other hand, employees with higher level of self-efficacy are likely to be more confident with their job competence. Thus, they may be less vulnerable to influences that may affect their organizational commitment negatively. This seemed to indicate that – to promote organizational commitment – employers and managers should focus more efforts in enhancing self-efficacy of employees.

In order to enhance self-efficacy of employees, employers and managers have to understand how self-efficacy is developed. In their study, Bandura, Adams, and Beyer (1977) discovered that self-efficacy may change over the process of a behavioral change, such as through participation in completing a new task (participative learning), or by observing someone successfully complete the new task (modeled behavior), such as in simulations and on-the-job training. Similarly, it was also observed in several other studies that training experiences would significantly affect self-efficacy (Gist, 1989; Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991). Therefore, employers and managers should develop systematic strategies in training and developing their employees, provide them with opportunities to try out newly acquired skills, and autonomy in solving work-related problems to help them develop self-efficacy.

Employers and managers should also constantly review job designs of employees. Operational routines may cause boredom at work and subsequently negatively affect job involvement of employees. Thus, job tasks of employees – scope and design – should be reviewed, enriched, and enlarged over time to create job challenges. Together with the other strategies to reinforce perceived organizational support and self-efficacy, job involvement would be enhanced. Collectively, these would contribute towards organizational commitment.

CONCLUSION

Although employee characteristics such as age and job tenure may be good predictors of organizational commitment, understanding of how attitudinal factors of employees affect their organizational commitment is important for more effective management and control of employee behaviors. The results in this study supported the hypothesis that self-efficacy, job involvement, and perceived organizational support of the subjects significantly contribute to their organizational commitment. Perceived organizational support appeared to contribute most ($\Delta R^2 = .524$, p<.01) to the variance in their organizational commitment, followed by self-efficacy ($\Delta R^2 = .155$, p<.01), and then job involvement ($\Delta R^2 = .028$, p<.01).

REFERENCES

Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Personality and Social Psychology*, *35* (3), 125-139.

Batesman, T. S., & Strasser, S. (1984). A longtitudinal analysis of the antecedents of organizational commitment. *Academy of Management Journal*, *27*, 95-112.

Buchanan, B. (1974). Building organizational commitment: The socialization of managers in work organizations. *Administrative Science Quarterly*, *19*, 533-546.

Chua, K. H. (1999). Optimizing human resource capability. In Anthony Kiob and Alice Jekop (Eds.), *Strategic human resource management: Creating a versatile state labour force*. Kota Kinabalu, Sabah, Malaysia: Institute of Development Studies (Sabah), 61-71.

Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of Applied Psychology*, *75* (1), 51-59.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, *71*, 500-507.

Gist, M. E. (1989). The influence of training method on self-efficacy and idea generation among managers. *Personnel Psychology*, *42*, 787-805.

Glisson, C. & Durick, M. (1988). Predictors of job satisfaction and organizational commitment in human service organizations. *Administrative Science Quarterly*, *53*, 61-81.

Hrebiniak, L. G. (1974). Effects of job level and participation on employee attitudes and perception of influence. *Academy of Management Journal*, *17*, 649-662.

Institute for Development Studies (Sabah). (1987). *Sabah action blueprint*. Kota Kinabalu, Sabah, Malaysia: IDS (Sabah).

Institute for Development Studies (Sabah). (2003). *Number of employed persons by the industry, 2002*. Retrieved Feb 13, 2004 from http://www.ids.org.my/publications/facts/2003/Nov-Dec.htm.

Koch, J. L. & Steers, R. M. (1978). An empirical analysis of organizational identification. *Academy of Management Journal*, *14*, 213-216.

LaMastro, V. (2003). Commitment and perceived organizational support. *National FORUM of Applied Educational Research Journal*, *13E* (3), [Electronic Version]. Retrieved July 3, 2003 from http://www.nationalforum.com/13lama~1.htm.

Lodahl, T., & Kejner, M. (1965). The definition and measurement of job involvement. *Journal of Applied Psychology*, *49* (1), 24-33.

Morris, J. H., & Sherman, J. D. (1981). Generalizability of an organizational commitment model. *Academy of Management Journal*, *24*, 512-526.

Mottaz, C. J. (1988). Determinants of organizational commitment. *Human Relations*, *41* (6), 467-482.

Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior*, *14*, 224-247.

Porter, L.W., Crampon, W. J., & Smith, F. J. (1976). Organizational commitment and managerial turnover: A longtitudinal study. *Organizational Behavior and Human Performance (1976)*, 87-98.

Porter, L.W., Steers, R. M., Mowday, R. T., & Boulian, P. V. (1974). Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of Applied Psychology*, *59* (5), 603-609.

Richard S. Gunting., & Ti, T.C. (1989). Changing economic environment and its implications on human resource development in Sabah. In Mohd. Yaakub Hj. Johari (Ed.). *Issues on human resource development in Sabah.* Kota Kinabalu, Sabah, Malaysia: Institute for Development Studies (Sabah). p.3-14.

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R.W. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports*, *51*, 663-671.

Shore, L. M. & Tetrick, L. E. (1991). A construct validity study of the Survey of Perceived Organizational Support. *Journal of Applied Psychology*, *76* (5), 637-643.

Steers, R. M. (1977). Antecedents and outcomes of organizational commitment. *Administrative Science Quarterly*, *22*, 46-56.

Stevens, J. M., Beyer, J. M., & Trice, H. M. (1978). Assessing personal, role, and organizational predictors of managerial commitment. *Academy of Management Journal*, *21*, 380-396.

Tannenbaum, S. I., Mathieu, J. E., Salas, E., & Cannon-Bowers, J. A. (1991). Meeting trainee's expectations: The influence of training fulfillment on the development of commitment, self-efficacy, and motivation. *Journal of Applied Psychology*, *76* (6), 759-769.

Yousef, D. A. (2000). Organizational commitment: A mediator of the relationship of leadership behavior with job satisfaction and performance in a non-western country. *Journal of Managerial Psychology*, *15* (1), 6-24.

Impact of Globalisation on Human Resource Management

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ABSTRACT

Globalisation- a wonderful way of living, doing business and working-along with information technology tend to bring paradigm shifts in human resource management and thereby a fundamental change in industrial relations. The paradigm shifts in human resource management include organization structure based on empowered teams, downsizing, de-layering, team design and analysis in place of job design and analysis, employee referrals and outsourcing in place of lengthy and detailed selection process, considering much of candidates' soft skills viz., attitude, aptitude and emotional intelligence rather than hard skills viz., technical skills, knowledge and abilities, on-line training and development in place of on-the- job and class room training and development , development–oriented performance appraisal and performance-based individual compensation package in place of designation-based uniform compensation package. Thus, these shifts are towards team/synergy based in case of employee contributions to the organization and towards individual/low-cost based in case of organization's contributions to employees.

Industrial relations generally denote the relationship of employees, employer, employees' associations, employers' associations and the State. Industrial relations deal employees in a collective sense. But the paradigm shifts in human resource management have set a stage to bring fundamental change in the concept of industrial relations i.e., shift from collective relationship of employees with the employer to individual relationship of each employee with the employer. In fact this is already set-in in information technology industry. Consequently, the role of other institutions of industrial relations viz., employees' associations, employers' associations and the State, is getting diminished. Thus globalisation tends to reshape the industrial relations as Individual Employee-Employer Relations. As such, individual bargaining slowly replaces collective bargaining, employee associations become weak, and the State slowly shifts its responsibility to the market forces.

This paper is based on the thesis that business environment determines the organisational and human resource strategies and in turn industrial relations pattern. The regulated business environment leads to formulating controlled and protective organisational strategies that in turn results in welfare-centred human resource strategies. These strategies produce equity-cum- protective based industrial relationswhere, employees' associations, employers' associations and the State protect employees'/employer's rights. On the contrary, deregulated business environment consequent upon globalisation leads to formulating competitive strategies that in turn results in competency building-cum-low-cost centred human resource strategies. These strategies produce individual and performance based industrial relations where market forces decide and defend/offend employee/employer rights.

This paper aims at exploring the shifts in industrial relations pattern consequent upon globalisation. The patterns of industrial relations before and after globalisation are explored, addressed, and compared based on the data and information collected from different types of organizations. Thus, this paper intends to build a model of industrial relations in congruent with globalisation.

INTRODUCTION

The business across the borders of the countries had been carried out since times immemorial. The post World War II period witnessed an unexpected expansion of national companies of mostly capitalistic countries into international or multinational companies. A number of countries initially were capitalistic and the sole objective of business during that stage was profit maximization through cost minimization of all inputs including labour. Then Managements followed commodity approach, machinery concept and factor of production approach to labour. Owners' of businesses in those days exploited the labour by following individual approach to human resource management viz., individual employing techniques, wages based on demand and supply factors and performance of individual employee etc., and maintenance of relations with individual employees, but not with a group of employees. Thus the individualistic approach to HRM in those days resulted in individual based

industrial relations. This approach led to excessive labour exploitation in all sectors in various countries, which resulted in shifting up of economic systems from capitalism to communism consequent upon the great revolutions and /or demand of the masses. Communism in various countries gave fillip to the birth and the growth of trade unions, and other institutions of industrial relations in order to protect the workers from exploitation.

The excessive and undue exploitation of labour was also common in India particularly in tea, coffee and rubber plantations and jute and cotton textile industries until 1920. The cumulative effect of such exploitation led to the formation of first all India trade union in 1920 i.e., All India Trade Union Congress, which inspired the formation of a number of company level trade unions and other all India unions like Indian National Trade Union Congress, Centre for Indian Trade Unions and Hind Mazdoor Sabha (Subbarao, 1999: 511-515). Emergence of these trade unions along with their militant tendency and revolutionary approaches could clog the labour exploitation in organised sector to a greater extent by establishing industrial relations institution like Collective Bargaining, Labour Welfare Officers, Joint Consultative Committees, Standing Orders and Tripartite and Bipartite Bodies. In addition, Government of India started playing its role of custodian of working population by involving itself in the industrial relations process and by enacting labour legislations. These developments changed the individualistic approach to HRM to collective approach, which in turn shifted the industrial relations from individual employee-employer relations to collective relations among employees, employer, trade unions and the Government in India. This had been the experience in various countries adopted mixed economic system or communistic economic system with varied degrees.

India's choice of mixed economic system and subsequent adoption of socialistic pattern of society enabled the trade unions to protect the workers even unduly by regulating the managements with the help of the labour laws in force that resulted in absence of work culture, formation of employee negative mind set, high demands and lower contributions of the employees and the like. This was more prevalent in public sector particularly during 1960s and 1980s. These developments to a considerable extent resulted in negative performance most of the public sector undertakings and limited performance of and low labour productivity in private sector. This situation was prevalent in other countries also particularly in communistic and socialistic countries in varied degree.

At this point of time, most of the economies in the world including the erstwhile communistic counties have chosen capitalistic pattern of society/ market economies in view of the limitations of communism. This global trend along with the huge fiscal deficit and crisis in balance of payments forced the Government of India to globalise its economy in 1991 and create a favourable climate for restoration of capitalistic tendencies or markets economic situations. Papua New Guinea (PNG) is relatively a newly born country, which got its Independence on September 16th 1975. PNG globalised her economy in 1986 along with the major world economies

Globalisation tends to result in exchange of the cultures across the globe, location of manufacturing centres and/or various business processes in and spread of markets to various countries. Thus globalisation led to internationalisation of capital, human resources, markets, material, management and manufacturing posing sever competition to the companies of developing countries from multinational and translational companies not only in their home countries but also in various foreign countries wherever the former operate (Subbarao, 2003:114-121). This multidimensional competition made the companies to align and realign all their strategies, operations and resources including human resources around the customer and customisation approach. Customisation approach to business was in fact, the earliest approach and it is coming back in a different degree (Moffat, 1990: 132-135 and Kotler, 1996: 266-267). This process has its impact on management of various resources including human resources.

Governments in capitalistic economic systems, provide free and deregulated environment to the business to operate and formulate competitive corporate as well as human resource management strategies (Human Resource Management Journal, 1997: 50). Further, globalisation provides free and deregulated environment for the business in all those countries whose economies are opened for the rest of the globe. As such business in such economies centre their strategies on customer, but not on humanness of human resources as they treat all resources equally for the purpose of winning the customer preferences in the short-run and deliciousness in the long-run. The deregulated environment created by the Governments and /or globalisation discourages most of the business regulative institutions or measures including industrial relations institutions, which hampers the freedom of the business to operate competitively. As such the terms and conditions of employment of human resources are mostly determined by the market forces, as is the case with other resources. Therefore, human resource management structure and industrial relations pattern are based on the theme of the corporate strategies that, in turn, are shaped mostly by the country's economic system and/or globalisation. Thus, globalisation along with the capitalistic economic system result in insignificant role for business regulating devices including collective approach to HRM and industrial relations (Sundeep Khanna(1996). Against this thesis, an attempt is

made to find-out the impact of globalisation on human resource management structure and on the industrial relations pattern in the two developing countries viz., India and Papua New Guinea.

OBJECTIVES

The objectives of this paper are:
- To study the impact of globalisation on human resource management structure in Indian public sector and private sector organization in comparison with those of Papua New Guinea,
- To examine the impact of structural changes in human resource management on the industrial relations institutions and pattern in India and Papua New Guinea, and
- To identify the cause and effect relationship among globalisation, human resource management and industrial relations in these two developing countries.

METHODOLOGY

Impact of the globalisation on significant areas of human resource management and industrial relations in selected public and private sector companies in India and Papua New Guinea has been studied. Companies are randomly selected representing both manufacturing and service sectors in India and Papua New Guinea. Both secondary and primary sources of information are resorted to collect necessary information for writing this paper. Structured questionnaires were canvassed electronically to selected companies and trade unions in India and personal interviews were conducted with the present and the former executives, trade union leaders and labour historians in Papua New Guinea in order to collect necessary information. However, limited responses of the respondents and availability of less time at the disposal of the researcher have been the limitations of the study.

IMPACT OF GLOBALISATION ON HUMAN RESOURCE MANAGEMENT

Impact of globalisation on human resource management structure and practices has been studied from the view points of organization structure, job design, human resource planning, employment, performance appraisal, human resource development, career planning, salary and benefits Further, the impact of paradigm shifts in the structure and practice of HRM on industrial relations has been analysed.

Organization Structure

Companies in the past structured their organizations based on functional or departmental and matrix structures and also believed that strategy follows the structure. But Chandler (Chandler, 1962:222) in his research study found that changes in a company's strategy bring about new administrative problems, which in turn, require a new refashioned structure for the new strategy to be implemented successfully. Corey and Star (Corey and Star, 1971) also view that a company's internal organization should be reassessed whenever strategy changes. Organisational structure is a managerial tool in the process of implementation of organizational strategies and in turn achievement of objectives. Thus, companies modify their organizational structures based on the strategy to establish the fit between strategy and the structure.

As stated earlier, organizations used to concentrate on departmental, functional, geographical and matrix structures before globalisation. Organizations during the last quarter of the 20th century inter-weaved the organic/ humanistic principles in place of mechanistic principles to bring an apt fit between structures and strategies. But organizations could not find appropriate fit between these structural approaches and the strategies formulated after globalisation.

As such the companies started structuring flat structures, team-based structures, strategic business unit structures, empowered structures and virtual structures, adaptive/mobility structures, flexible structures, decentralised structures and externally focused structures during the post-globalisation period. Organization design based on these approaches result in broad banding characterised by a few levels, empowerment of employees, payment based on individual/team performance, horizontal reinforces, and few rules (Rastogi, 1998:45-46). In addition, companies with multiple portfolios also started adopting different structures for different portfolios of the organizations rather than one structure for the entire company. As such the human resource management implications vary from one portfolio to another portfolio of the same company. Further, human resource management policies and practices also vary from one strategic situation to another strategic situation. For example, Government of India allowed the establishment of private sector banks after 1991 as a

part of the process of globalisation and liberalisation that in turn created a problem of severe competition to the existing public sector banks like State Bank of India, Syndicate Bank, Indian Bank and Punjab National Bank. These banks formulated a low cost strategy in order to meet the competition from the private sector banks. As a part of implementation of this strategy, these banks de-layered their organizations by closing regional offices. In fact, information technology provided an opportunity of coordinating the branch offices by making most of the operations that were hither to performed by the regional offices redundant. In addition to de-layering, these banks also downsized their operations as a part of implementation of low cost strategy. Consequent upon de-layering and downsizing, these banks had to change their organization structures. These decisions resulted in retrenchment of surplus human resources in the name of golden hand-shake/voluntary retirement, providing new skills to sizeable employees owing to redundancy of certain skills(Human Capital,2000:18), mobility of a significant number of people to the new jobs consequent upon change in organization structure along with the introduction of information technology on massive scale and expansion of mutual funds portfolio of these banks and creation of new portfolios like issue management, housing finance and the like . Similar examples are also drawn from the banking industry of Papua New Guinea.

The process of globalisation, liberalisation and privatisation   in Papua New Guinea which was initiated in 1986 helped the Bank of South Pacific (BSP) to acquire a public sector bank viz., Papua New Guinea Banking Corporation (PNGBC) on 10th April 2002 , despite the huge opposition from the employees of the latter. Bank of South Pacific acquired and absorbed Papua New Guinea Banking Corporation in April 2002. by bringing major changes in the latter's organization structure. Some of the PNGBC employees were retrenched and some other employees were redeployed to various jobs in BSP. Consequently the size of employment of the Bank of South Pacific declined from 2099 in April 2002 to 1904 in December 2002 (Bank of South Pacific Annual Report, 2002:19) , despite the increase in assets from Kina 765.9 million to Kina 1799.2 million , deposits from kina656 million to Kina 1552 million, capital from kina77.4 million to Kina 146.5 million and net profit from kina18.9 million to Kina54.7 million during the period 2001 and 2002(Bank of South Pacific Annual Report,2002:30)

Thus, the shifts in organisational structure in case of public sector companies in these two countries occurred due to the fact that the Governments in both the countries either partly or fully shifted their responsibility of doing business to the shoulders of the private sector or shirked its responsibility of supporting the public sector organizations in carrying out their business followed by the globalisation which resulted in either retrenchment or redeployment or transfer of employees to lower level jobs. This process necessitated the individual employees affected by the structural shifts to acquire new skills, accept new jobs which carry different compensation packages, some times lower than the previous ones. Thus the HRM policies/practices of the companies were revamped towards the individualistic approach, which gradually affected the industrial relations process. Employees and trade unions, which were the significant actors of the traditional industrial relations neither opposed these moves of the management nor collectively bargained with the management effectively as the governments and managements, set their minds in tune with the challenges of globalisation. In fact, the other significant actor of the traditional industrial relations i.e. government shifted itself to the management side as it relinquished its basic philosophy of custodian of employees for the competitively high growth rate of industrial development of the country, compared to other countries.

The situation of structural shifts is more dramatic in private sector compared to that of public sector, consequent up on strategy shifts and the environmental sensitiveness. Coca-Cola followed the brown-field strategy in entering the Indian Market and as such acquired the manufacturing facilities of the existing bottling companies throughout the country without the obligation of retaining all the employees of these bottling companies. This resulted in retrenchment, redeployment, re-training, salary-cut and/or demotion for poor-performers and abnormal salary hike and /or promotion for high-performers. Employees /trade unions of the former bottling companies could not play their due roles as they hither to played before globalisation. According to the trade union leaders of Coca-Cola India Limited, Hyderabad Unit, it is mostly due to the fact that management created the fear of loss of jobs in the minds of employees and thereby followed the individualistic HRM approach. According to the Regional Human Resource Manager, Coca-Cola India follows individualistic HRM approach due to frequent structural shifts in the wake of severe competition from Pepsi-Cola.

Similar incidents are also common in case of Indian private sector companies in view of competition from national as well as multinational companies. Companies in sun-setting industries group like Panyam Cements Limited restructured its organization by downsizing its operations in order to cut the costs due to sever competition based on cost. This strategy resulted in retrenchment, hike in work-load, out-sourcing and long-working hours. Tata Electricals and Locomotives Limited, Viskhapatnam Steel Plant of Steel Authority of India Limited also follow the individualistic HRM approach due to the structural change and implementation of turn-around strategy consequent up on globalisation. Individualistic HRM approach in these organizations also made the trade unions defunct unlike before globalisation (Business World: 1989:54).

Revamping organisational restructures and shifts in the structures are relatively more volatile in the software industry as its environment depends upon its cliental organizations, their structures, level of technology, etc. In fact rate of change of technology is highest in software industry compared to other industries. In addition either out-sourcing or being out-sourced is quite common in software industry that led the companies of this industry to design their organization structures based on virtual structures and /or flexible structures. The flexible structure in variably results in flexible-cum-individualistic HRM approach while the virtual structure result in either non-commitment or insignificant commitment to the human resource aspect of total operations management.

Thus the implementation of competitive strategies consequent upon globalisation led to structural shifts in varying degrees in different types of business firms i.e., public sector, private sector, national, multinational, large, small, sun-setting, maturing and sun-raising resulting in the creation of new organisational structures like team structures, virtual structures, flexible structures etc. These new structures created an opportunity to the managements to deal with the employees individually in employment, development and compensation. But at the same time these structures require the employees to work in temporary and flexible teams in contributing to the achievement of the strategies efficiently. In turn the HRM policies and practices took paradigm shift from the individual contribution to team contribution as employees work in a team as lines of commands and control are wiped out in the team/flat/virtual structures which would result in synergy in case of employees' contribution to the organization is concerned. These structures also result in the shift of collectivistic HRM approach to the Individualistic HRM approach in case of employing, developing and compensating the employees which is in contrast with the HRM structure and practices followed before globalisations.

Job Design

The next significant aspect of in human resource management is job design and analysis. Traditionally jobs were designed based on engineering approach and later based on the humanistic and job characteristic approaches. These approaches led to narrow jobs, which did not fit in the framework of post-globalisation business strategies. Consequently companies started re-designing the jobs based on job bandwidth, which is based on employee multi-skills and empowerment, and horizontal reinforces. Further, some companies found that team design rather than job design has appropriate fit to the post-globalisation business strategies, resulting in de-jobbing (Vikram Chhachi,1996).

Team design and de-jobbing consequent upon employee multi-skills lead to surplus of workforce and thereby resulting in retrenchment, flexible work and work sharing barring the traditional formal communication channels and lines of command (Team Power, 2000:34). Employees learnt how to adept themselves to these shifts in job design due to fear of loss of job or cut in compensation package. In addition, organizations also provided training and facilitation programmes and enabled the employees in acquiring multi-skills and to cope up with the new demands of competitive and challenging strategies.

Dr. Reddy's Laboratories in India before introducing business process reengineering in 1998 indicated the possible consequences and demands on employees and enabled them individually to cope-up to the new demands ignoring the trade aurous. All the employees geared up to the requirements of the business process reengineering like teamwork, multi-skills, flexible work, work-sharing etc. The organization could implement the business process reengineering with no difficulty from the employees side. Thus trade unions-an important actor of industrial relations was ignored in this process.

Some Indian organizations like State Bank of India and Life Insurance Corporation of India formulated the retrenchment strategies like transformation through computerization before globalisation. Trade unions did not allow the managements to implement the strategy through various techniques of industrial conflicts. (Business To-day, 1984:16). However, these organizations could implement these strategies smoothly after globalisation that resulted in massive shifts in job design, job description and job specification. In addition, broad–banding replaced narrow jobs and team design replaced job design to a greater extent. Consequently a number of employees were retrenched through voluntary retirement scheme and other employees were trained and redeployed. Thus these organizations could implement the strategy and redesigned the jobs as the globalisation process made the trade unions and other actors of industrial relations defunct, by upholding the organizational interest.

Change in the job design is quite normal in the software industry like WIPRO, Infosys and Tata Consultancy Services Limited and the young employees in this industry do automatically change their mindset and skills depending upon the skill requirements owing to the threat of loss of job or lower salary. In fact, software industry that emerged mostly after globalisation is a non-union industry. Thus globalisation resulted in significant shifts in job design to de-jobbing, multi-skilling and employee empowerment. These paradigm shifts

in job design enabled the teamwork and resulted in synergy in case of human resources contribution to the organization.

Human Resource Planning

Globalisation along with information technology enabled the production technology transferable from country to country easily and at a fast rate. Consequently, organizations started concentrating their strategies around technology that were hither to concentrate around human resources before globalisation. Thus, organizations reduced their emphasis on human resource planning but increased emphasis on technology planning as a part of their strategic planning. Organizations like Satyaun Computers, Wipro and Infosys shifted their human resource planning from number of and kind of employees to internal skill mobility planning. The traditional industries like Indian Railways, Tata Iran and Steel Company Limited in India and Eda Ranu in Papua New Guinea plan for outsourcing rather than plan for human resources exclusively for them. Major Indian Railway trade unions viz., All India Railwaymen's Federation and National Federation of Indian Rail-workers, which were volatile in protecting employee interest before globalization became silent when Indian Railways planned for outsourcing certain operations, like catering and sanitation in railway stations.

Human Resource planning function was under the influence of trade unions before globalisation as the latter had been insisting on the less number of working hours, short shifts duration. In addition, Government of India had been influencing the managements of public and private sector companies in planning for recruitment of candidates from certain communities in their human resource planning, as a part of its reservation policy. But, the Government after globalisation stopped influencing the private sector in this regard as a part of its strategy of attracting foreign investment.

Thus globalisation has been contributing to the shifts in human resource planning like planning for skill-mobility and outsourcing plan. In addition, globalisation either minimized or eliminated the influence of two actors of industrial relations viz., trade unions and government on human resource planning.

Employment Practices

Domestic business environment has become more volatile due to the foreign direct investment, technology transfers, fast expansion of the operations of multinational companies and translational companies, mobility of the human resources, dispersion of manufacturing facilities with the help of information technology and soft political and economic policies of the governments towards foreign companies owing to globalisation. These developments in variably reduce the gaps between national business environment and international business environment. Added to this, the global companies have learnt how to produce, market and operate like a local company in various countries they operate, by acquiring the characteristic of local companies i.e., having the strengths of a global company and operating like a local company. These factors magnified the competition between multinational companies and domestic companies and made both the companies to formulate and implement strategies and counter strategies by acquiring competitive abilities and distinctive competencies at a fast rate (Dhawan Radhika, 1996:62-64). Of late, these companies realized that the appropriate human resources both in terms of hard skills and soft skills bring the distinctive capabilities in production, finance, marketing and other areas. Consequently, they started developing appropriate techniques in employing right human resources at a fast rate rather than relying heavily on traditional techniques of recruitment and selection.

The most important such recent techniques of recruitment followed by many sun– raising companies such as Zee Telefilms Limited, Global Trust Bank Limited, Satyam Computers Limited, and Bio-technologies Limited in India and Deltron, Datec and Global Technologies in Papua New Guinea is ' Employees Referrals'. Employees referrals is requesting the present employees to recommend prospective employees and motivating them to apply as the latter are well aware of hard and soft skills of the candidate (s) they refer and also the job and organizational requirements. Present employees provide information of most suitable candidates as it determines their credibility in the company. These shifts in the recruitment practice reduced the importance of trade unions and also Government in addition to relying upon the lengthy selection procedures of the past.

Other shifts in the recruitment practices include walk-ins, consult-in, head-hunting, body shopping e-recruitment and outsourcing. All these new practices help the companies to formulate and implement strategies fast and efficiently in the dynamic environment. Organizations, of late discovered that the soft skills compared to hard skills of employee determine the employee's efficiency on and contributions to the job and thereby to the achievement of the competitive strategies after globalisation. As such organizations started emphasizing on testing the candidate's aptitude, attitude, emotions and interest. In fact, Infotech Limited discovered and realized that the employees with positive attitude take-up the activities willingly on their own and they acquire the

necessary skills, if they do not possess them (Subbarao, 2003,:103),commit themselves to the organisational goals and strategies and thereby towards their individual goals rather than looking for trade unions or Governmental agencies for help. In the words of Regional Human Resource Manager, Andha Pradesh Region of Coca–Cola India Limited, such employees not only eliminate the unnecessary intervention of trade unions, but also reduce the amount of supervision and enhance productivity.

The complex strategies led the organizations to select the candidates and employ them with multi-skills rather than expert skills in one area. Some of the companies like L&G in India, Larsen and Toubro Limited's cement works division in India realized that most of the company operations up to a certain level could be performed by majority of the employees, if required basic skills are provided through formal or informal training. As, such L&T started selecting the candidates with basic multi-skills and developing them and empowering them. These employees, always look for a change and thereby not only pro-act to organizational requirements, but also fully commit themselves towards the achievement of organizational strategies. These employees do not have need for or time to think of trade unions or government for support, as organizations never find a chance to victimize them. In addition, the other shifts of selection like on-line selection tests and on-line interviews enable the companies to reduce the cost of and time duration in this process.

Performance Appraisal

Other significant area in human resource management is performance appraisal. Performance appraisal techniques were traditionally used to punish the employees and then trade unions used to interfere in the management's decisions and actions and protect the employees. Of late, organizations started using performance appraisal ratings for identification of employee weaknesses and initiate training and development programmes in order to develop employees that in turn reduced the role of trade unions.

360^0 performance appraisal is another major shift in performance appraisal area that enables the employees to have all-round feedback and to initiate the steps to correct and develop themselves to contribute efficiently for strategy implementation, as is the practice in Coca-Cola India and Larsen and Toubro Limited. Other performance appraisal shifts include: developing performance measures to assess the value addition of human resource contributions as adopted by Royal Dutch Shell, measuring employee involvement in key corporate functions as adopted by KPMG Peat Mar Wins and Federal Express (Subbarao, 2003: 138), aligning performance systems with strategies, creating internal performance consultants to define benchmarks along with employees, analyse performance and enable the employees to attain it. These shifts aim at enabling the employees to understand the strategies, acquire necessary skills to contribute to the achievement of strategies and develop confidence in attaining the benchmarks (Sharma, 2000:29). Thus shifts in performance appraisal also eliminated the influence of trade unions and tend to follow individualistic approach to HRM.

Human Resource Development

Traditionally trade unions and collective bargaining institution were less concerned with training and development aspects of human resource development. In fact, managements have been concerned much with these aspects as employee contribution to the organizational strategies depends on how efficiently they are imparted with necessary skills, knowledge and aptitude. There is no phenomenal shift in the role of industrial relations institutions in this regard even after globalisation, as their role was and is dismal before and after globalisation. But trade unions and governments as actors of industrial relations were/are concerned with the career planning and development aspect of HRD (Rao, T.V.,1991:21) The managements during the post-globalisation era take interest in career planning and development of those employees whose skills are in demand. As far as career planning is concerned most of the companies belong to sun-rising and maturing industries in India are going for contract staff rather than concentrating on career planning due to the advantage of the former over the latter. Thus the globalisation resulted in excessive dependence of the companies on contractual staff rather than regular staff that reduces the budget on human resource development as is the practice in Larsen and Toubro Limited in India and Eda Ranu in Papua New Guinea. Contract staff takes care of their training and development by themselves (Human Capital, 2001:48). Further, they never become the members of company trade unions. Thus globalisation, in this respect contributes for the decline in membership of trade unions and thereby their finances and activities.

Salaries And Benefits

Government of India before globalisation favoured socialistic pattern of society and consequently minimization of inequalities in the distribution of incomes and salaries. In fact, these were the trends in the erstwhile socialistic and communistic countries before globalisation. But, the market economies around the globe disfavoured these trends and set a new trend for wage differentials in order to attract high skilled and talented employees (Human Capital, 1999:16). In addition, market forces determine the price for all resources including human resources. Thus globalisation results in higher salaries and benefits for those employees whose skills are in scarce supply and lower salaries for those employees whose skills are in abundant supply (Human Capital, 2001:18).

In addition, globalisation also set trends for adjustment of salaries based on performance. As such different employers working on the same job get different salaries based on their performance levels, as is the case with Coca-Cola India, Infosys, Satyam Computers and Wipro in India and Daltron, and Global Technologies in Papua New Guinea. Thus salaries and benefits vary from employee to employee based on their performance levels and demand and supply factors. However, public sector is an exception to this shift. Consequently individual bargaining based on demand and supply factors displaced the collective bargaining in this regard also paving the way for individualistic HRM. However, salary increase has become a rare phenomenon in public sector after globalisation.

SUMMATION OF IMPACT ON HRM

The above analysis indicates that globalisation resulted in paradigm shifts in human resource management in various sectors in varying degrees and nature. Large scale private sector which has been exposed to international competition directly and small scale private sector which exposed to domestic competition directly and global competition indirectly experienced paradigm shifts in human resource management viz., down-sizing, de-layering, virtual organizations, team design, outsourcing, de-jobbing, employee empowerment, development based performance appraisal, on-line training, employee-based training, salary based on performance and demand and supply factors, and the like which resulted in the individual employee based human resource management in case of employment, training, development, and compensation and team based human resource management as far as employee contribution to the achievement of organisational strategies is concerned. These paradigm shifts invariable have their impact on industrial relations, as industrial relations are the outcome of the human resource management.

Impact Of Globalisation On Industrial Relations

Industrial relations deal with the relations among workers and their unions, management and their organizations and the state. As such the three important actors of industrial relations are the workers and their organizations, employers and their organizations and the Government (Dunlop, John T. 1958: viii). The interactive and dynamic roles played by these crucial actors in the process of protecting the interests of workers and companies in a balanced and mutually exclusive manner created a number of industrial relations institutions including collective bargaining, machinery to prevent and settle industrial disputes and participative management. Traditionally, these actors and institutions of industrial relations had been expected to maintain industrial peace and to secure unreserved cooperation and goodwill among different groups in industry with a view to drive energies and interest towards economically viable and socially desirable channels. It also aims at the development of a sense of mutual confidence, dependence and respect and at the same time encouraging them to come closer to each other for removing misunderstanding, redressing grievances, if any, in a peaceful atmosphere and with open mind and fostering industrial pursuits for mutual benefits and social progress (Subbarao: 1999:494-495).

Trade Unions

The commodity approach towards labour and machinery concept of labour together with the management's exclusive concentration on their goal of profit maximization by exploiting labour resulted in the formation of trade unions to remind the management to aware of their responsibilities towards the most important and living resource of the organization i.e., human resource. Thus the trade unions were emerged to protect the employees' interest.

Trade unions across the globe had been recognised as legitimate social and economic organizations of employees and have become part and parcel of industrial organizations as a vital organ of industrial relations. Trade unions aim at achieving various objectives primarily protecting the economic and social interests of

employees and as such they have helped workers in getting higher economic gains, sometimes without enhancing employee contribution to the organisational goals. They have also succeeded in unionising workers in small business entities.

Trade unions have undergone serious stresses, negotiated with managements and sometimes fought against employers by organising strikes and by threatening managements in order to achieve the demands of workers. They adopted various strategies to safeguard workers' interests including representing the workers' issues to the management, negotiating in the collective bargaining, organising strikes, enforcing political pressures etc. As such, management of most of the companies could not make unilateral decisions before globalisation that might have affected employee-employer relations directly or indirectly, positively or negatively. Further, management were restricted in the areas when they could take decisions about human resources management independently of the trade unions as the latter became more sophisticated and professional. Thus, unions before globalisation became employer-regulating device and sought to regulate the discretion of employers at every point where their action might have affected the welfare of employees. Trade unions questioned, criticised, challenged, modified and regulated even the corporate strategic decisions particularly those affected the employees before globalisation.

Trade unions, thus, played a vital role in protecting employees' interest and a devil's advocate role for managerial decisions and actions, before globalisations. This is true in case of all kinds of Indian organizations (public sector, private sector and small industries) like Indian Railways, Indian posts, Hindustan cables Limited, Anhra Prsdesh State Road Transport Corporation, Tata Electrical and Locomotive Company Limited and Andhra Pradesh Lightings Limited and organizations in Papua New Guinea like Air Niugini, PNG Telekom, and the erstwhile PNG Banking Corporation. The situation of protective and welfare economics strengthen the trade unions in terms of membership, finance, organization and militant strategies and political leadership and enabled them to fight against managements of various companies, some times leading to organisational dysfunctional and chaos.

Globalisation along with the deregulation of economies led to severe competition among businesses and placed the customer first by displacing the position of employees and made the latter and their unions to realize that they are also for customers along with management but not vice-versa. This situation led to the employees to realize that they have to protect themselves and serve the customer most efficiently by developing skills and positive attitude. The able employees came out of the shadow of trade unions, acquired new skills, realized their potentialities and have grown beyond the expectations of their own as well as organizations through their individualistic approaches.

The globalisation process forced the governments and political parties to withdraw their support to trade unions. As such trade unions could not protect the interest of less skilled employees from loss of jobs when organizations downsized their operations and retrenched the less able employees and finally became lean in membership, finance, organization and leadership. Even the largest employees' federations in India like all Indian Trade Union Congress and Indian National Trade Union Congress and in Papua New Guinea like Communication Workers' Union, Financial Workers Union etc. tend to reach this stage. As such, it is needless to mention the situation of regional and organisational level trade unions. Thus trade unions tend to reach the stage of decline. It can be said that the capitalistic and globalisation trends drive the trade unions in a reverse gear. The decline of trade unions in variably has its impact as the functioning of collective bargaining.

Collective Bargaining

Collective bargaining is a process of negotiations about the terms and conditions of employment between employer and a group of employees or one or more trade unions with a view to reaching an agreement (International Labour Organization, 1957: 3). There has been evident that trade unions and management of almost all the public sector organizations and large and medium private sector organizations used to negotiate on terms and conditions of employment and arrive at agreements and consequently notify human resource management policies and strategies based on the collective agreements. Collective bargaining in Indian Railways, Indian Posts etc. has been a continuous process under the permanent negotiating machinery. Similarly, collective bargaining in private sector industries like Southern Pesticides Limited, Navabharat Ferro Alloys Limited and Nizam Sugars Limited in India was also a continuous process. Collective bargaining before globalisation played a vital role in settling the terms and conditions of employment, though minor issues of individual employees which had no bearing on other employees were redressed through the grievance procedure in most of the Indian organizations. This is also the case with PNG Telekom Limited, erstwhile PNG Banking Corporation, Eda Ranu, etc. in Papua New Guinea. Thus, the collective bargaining was instituted and functioned with a certain degree of effectiveness mostly due to the fact that terms and conditions of employment were common at least for a group of employees and the trade unions had the power to modify human resource policies formulated by management in each company before globalisation.

The post-globalisation scenario tends to drive collective bargaining in a reverse direction as terms and conditions of employment vary from employee to employee and the power of trade unions in modifying management's decisions was drastically revamped . The decaying trend of trade unions and /or emergence of non-union organizations during the late 1980s contributed to the shift from collective bargaining to individual bargaining in private sector. Dr. Reddy's Laboratories, Ushodaya Publications Limited, Eicher Tractors Limited, Satyam Computers switched over to individual negotiation during the post-globalisation era. However, the public sector industries like Indian Railways, Bharat Heavy Plates and Vessels Limited, Visakhapatnan Steel Plant of Steel Authority of India Limited, and Hindutan Cables Limited still continue collective bargaining in certain minor issues in principle as the terms and conditions of permanent employees are common. Similar trends are also observed in public sector undertakings of Papua New Guinea.

The competition from domestic private sector industries and multinational companies forced the public sector to adopt retrenchment and restructure strategies. For example, Viskhapetnam Steel Plant of Steel Authority of India Limited, Hindustan Cables Limited and Bharat Heavy Plates and Vessels Limited adopted down sizing and turnaround strategies. Consequently they retrenched redundant employees, outsourced certain employees' functions, trained and developed the partially redundant employees without negotiating most of these issues in collective bargaining. Thus management tend to take unilateral decisions in these areas without negotiating in collective bargaining meetings. Collective bargaining with regard to vital issues even in public sector took the shift to individual bargaining along with that in private sector.

Thus bargaining is phenomenally shifted to individual bargaining from collective bargaining in private sector and to a considerable extent in public sector. The fundamental changes in trade unions and collective bargaining invariably bring the shifts in nature and degree of industrial disputes.

Industrial Disputes

Though several measures are taken to manage human resource, satisfy the demands of employees and employer, disputes between employees and employer take place due to conflict of interest between capital and labour. The collective forms of industrial dispute like work-to-rule, strikes by all or a group of employees, lay-offs and lockouts were common before globalisation. Indian newspapers and magazines were publishing the news items of industrial strikes and lockouts prominently before 1990s, but could not do so later. It is quite abnormal to listen to strikes and lockouts in India as well as Papua New Guinea public, private, large and small-scale sectors after globalisation. This is mostly due to the individualistic approach adopted by the business in managing their human resources. Under this approach, employee quits the job on his own, if he is dissatisfied with the terms and conditions of employment and the management terminates the services of individual employee, if it is not satisfied with employee contributions and /or discipline. This is just and a simple way of solving the employee-employer disputes and terminating their relationships. These trends have become more prevalent in various private sector organizations like Satyam Computers, Infosys, Larsen and Toubro Limited, Coca Cola India and Tata Consultancy Services Limited. However, public sector organizations like State Bank of India, Hindustan Cables Limited, and Hindustan Petrochemicals Limited introduced the voluntary retirement scheme and enabled the employees to quit the organization on their own. But, they are still unable to terminate the service of unwanted/ redundant employees due to the nature of the organization. Bank of South Pacific, Eda Ranu , Telekom PNG Limited etc., terminate the services of unwanted or redundant employees easily. In fact Papua New Guinea organizations mostly follow the contractual employment even for the nationals. Thus, manifestation of conflicts took a reverse direction in all organizations in PNG and private sector organizations in India and a mid–way direction of docile nature in Indian public sector organization during the post-globalisation era.

Participative Management

The next important institution of industrial relations is the worker's participation in management. The concept of workers' participation in management crystallizes the concept of industrial democracy, and indicates an attempt on the part of an employer to build his employees into a team which works towards the realization of a common objective (Kesari, 1971: 4). Some of the public sector organizations and a few private sector organization adopted different schemes of workers' participation in management like Works Committees, Shop Councils, Joint Councils and Joint Management Council before globalisation. However, these councils or committees could not function efficiently mostly due to non-cooperation of the managements which were of the view that workers lack managerial abilities and they encroach the management and ownership of the firm as India was a socialistic pattern of society before globalisation.

But globalisation and economic liberalisations changed the direction of Indian and PNG economies towards market economies. Competition, consequent upon globalisation forced the managements to realize that human resource offers them a distinctive competency. As such managements to day encourage the employees to participate in decision-making, share their ideas and knowledge, disseminate the information they acquire at workplace and empower them by developing multi-skills to make decisions on their own. Globalisation led to optimum utilisation of human resources through participative management approach and contributed to the attainment of the goals of workers' participation in management idea which was hither to failed before globalisation. Thus globalisation tends to drive the operation of if not the theme of workers' participation in management in reverse direction.

CONCLUSION

The analysis of impact of globalisation on human resource management structure and on industrial relations pattern indicates that globalisation brought paradigm shifts in human resource management structure and pattern in both the countries understudy with varying degrees like de-layering, team and virtual structures, downsizing, multi-skilling de-jobbing, more weighages on employee soft skills like attitudes, emotional intelligence and the like in employee selection, outsourcing of human resource, on-line training and employee's own initiatives for self development, use of performance appraisal for employee development, compensation based on demand, supply factors and performance levels of each employee and the like. These paradigm shifts changed the traditional collective approach of human resource management to individual approach of human resource management in case of employment, development and compensation and team based structure in case of employee utilisation.

These paradigm shifts in human resource management structure brought fundamental change in industrial relations institutions and pattern. The major actors of industrial relations have been either made defunct or tend to withdraw from their respective roles and consequently only employees and employer remain to play their roles in industrial relations which was similar to pre-1920s periods of Indian industrial relations scenario and the early stage of industrial relations in Papua New Guinea. Similarly the important institutions of industrial relations like collective bargaining, Welfare Officers, Bipartite and Tripartite bodies became irreverent and redundant as employer directly deals with individual employees based on market forces and/or employee performance levels after globalisation with minor exceptions. However, the institution of Workers' Participation in Management, which could not function efficiently before globalisation, started functioning in its idea-form efficiently after globalisation due to the competitive environment.

Therefore, it is viewed that globalisation provides free and deregulated environment to the business to operate, which in turn resulted in severe competition and formulation of competitive strategies. This competitive situation forced the companies to develop competency building-cum-low-cost centred human resource strategies. These strategies demand for getting highest human resource productivity at the lowest possible cost. The efficient implementation of new human resource management strategies demanded a non-regulative environment from the industrial relations institutions paving the way for a fundamental change in industrial relations system. Thus globalisation tends to bring significant shifts in HRM i.e., from collective to individual HRM and thereby a fundamental change in Industrial relations i.e., collective relations to individual relations.

In contrast, communistic/socialistic economic systems before globalisation along with closed economies made the governments to act as the custodian of the nation and establish welfare institutions and demanded both the public and private sector industries to formulate welfare-centred corporate level and human resource strategies. Consequently a number of industrial relations institutions came in to being and checked and controlled the implementation process of employee protection. Thus Industrial relations institutions find a significant role to play in communistic/socialistic economic systems.

Therefore, it is viewed that the communistic/socialistic economic systems (closed economies) result in protective human resource management structure and thereby collective and welfare-centred industrial relations and capitalist economic systems (global economies) result in competitive human resource management structure and thereby individual and contingency based industrial relations.

REFERENCES

Benchmarking HR (1999), Human Capital, (3),6, November ,p.18.
Bank of South Pacific Annual Report, 2002:30)
Business World, 1-7 July,1989 p.54
Business to-day, 16-30,November 1984,p.16

Corey,Raymond and Star, Steven H.,(1971) *Organizational Strategy: A Marketing Approach,* Harvard Business School ,Boston.

Chandleer, Alfred (1962), *Strategy and Structure,* MIT Press, Cambridge, Mass.

Dhawan,Radhika(1996), *How to Recruit on Campus, Business to-day, January 7-21.*

Dunlop John, (1958), *Industrial Relations Systems*, p.(viii)

Human Capital (1999), July, p.16.

Human Capital (2001), August ,p.18.

Human Capital (2001), September ,p.48.

Human Resource Management Journal, 1997, p.50.

International Labour Organization (1957), *Collective Bargaining,* Workers' Educational manual Series,p.3.

Kesari,J.P.,(1971),*The System of Workers' Participation in Management*, Indian Journal of Social Work, xx (i),p.4.

Kotler Philip (1994), *Marketing Management*, Prentice Hall,pp.266-267.

Moffat Susan (1990) ,*Japan's New Personalised Production*, Fortune, October 22, pp.132-135.

Rao,T.V.,(1991),*Reading in Human Resource Development*, Oxford& IBH Publishing Company Private Limited, New Delhi.

Sharma Anurag (2000), *Performance Management*, Human Capital, May, p.29.

Skaria George (1996), *The New People Management*, Business To-day, January 7-21,pp.28-33.

Subba Rao,P.,(1999) *Essentials of Human Resources Management and Industrial Relations,* Himalaya Publishing House, Mumbai

Subba Rao,P.,(2003) *Personnel and Human Resources Management,* Himalaya Publishing House, Mumbai

Subba Rao,P.,(2001), *Business Policy and Strategic Management,* Himalaya Publishing House, Mumbai

Sundeep Khanna(1996), *The New People Economy*, Business To-day, January 7-21.

Vikram Chhachi (1996), *The Job Design Technique*, Business To-day, January 7-21.

Team Power (2000) , (1),5,November,p.34.

Job Rotation And Employee Career Development Among Production Workers

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ABSTRACT

The main purpose of this study was to examine the significant relationship between job rotation and employee career development among production workers. A model of job rotation developed by Campion, Cheraskin and Stevens (1994) was used as the premise to test the linear relationship between job rotation and employee career development outcomes that are career progression, knowledge and skill and career management. This is done by analyzing survey-based data sets particularly obtained from samples of 209 production workers in Japanese electronic manufacturing companies operating in Malaysia. The Pearson Correlation was used to measure the association between the variables and to test the research hypotheses. The results of the study reveal that there were significant correlation between job rotation practices and three career development outcomes, namely, career progression, knowledge and skill and job rotation benefits. The practice of job rotation in the workplace has played an essential role in employee development and can provide a lot of opportunities for employees to gain necessary skills and knowledge for future advancement. Job rotation is considered as an important on-the-job training and first emphasis must be given in designing and implementing job rotation program systematically for all level of employees.

INTRODUCTION

Job rotation refers to the systematic movement of employees from job to job or any change in assignment or responsibility on the premise to enhance employees' experience in the jobs (Kirk et al., 2000; Olorunsula, 2000; Khairul Aidil et al., 2000; Campion et al., 1994; Thamhain, 1992). Job rotation is one of career development intervention that has been used in providing employees with good foundation for developing their career in the workplace. The practice of job rotation has long been espoused in various human resources management area such as employee learning, career satisfaction and interpersonal effectiveness (Susan, 1996; Campion et al., 1994; London, 1983). Even though a great deal of studies have addressed the issues of job rotation from specific areas of human resources management, only a few studies have investigated the influences of job rotation practices on employee career development in the workplace (Campion et al. 1994; Ortega, 1999). However, there has been no attempt to examine the issue of job rotation and its relationship to employee career development especially among workers in Japanese manufacturing companies in Malaysia (Raduan, 2002; Lai Wan, 2001).

The main purpose of this study is to examine the significant relationships between job rotation and career development among production workers in Malaysia. The specific objectives are:

  i.   To determine the relationship between job rotation practices and career progression;
  ii. To determine the relationship between job rotation practices and knowledge and skills; and
  iii. To determine the relationship between job rotation practices and career management

The implementation of job rotation practices can be seen in the case of Japanese firms (Cosgel and Miceli, 2000). One element that appears to be fundamental of the Japanese model of human resources management (HRM) is the characteristic of flexibility Japanese firms, which depends on multiskilled employee. According to Koike (1984), job rotation was practiced in Japan as early as the late 1950s and hold true for all employee in many Japanese firms. In view of human resource management, many researchers have described job rotation in broader areas. For instance, Noe and Ford (1992) described job rotation as opportunities for employee to gain a broader knowledge of different functional areas and to develop a network of organizational contacts.

LITERATURE REVIEW

Job Rotation And Career Development

Kirk et al. (2000) defined career development as a process for achieving specific employees and organisation goals, which include providing career information to employees, helping employees identify advancement opportunities and promoting job satisfaction. Likewise, career development program also can be used to sustain or increase employees' current productivity and to achieve a balance between the individual's career needs and the organisation workforce requirements (Leibowitz et al., 1986). In other words, career development activities can help employees discover their vocational interests and strengths, whilst, employers can make it as a way to attract the best employees and retain them over time.

A study by Wright and Belcourt (1994) noted that on-the-job training is the primary vehicle for employee development in the organisation. They suggest that learning from experience or learning by doing such as business simulation and job rotation can enrich employees' development opportunities. This argument is made based on the premise that exposure to many functions within the organisation can provide them with multiple areas of expertise.

Career Progression

With regard to career progression, Campion et al. (1994) classified employee career progression into two dimensions, which include promotion and salary growth. According to Indahwati and Brian (2001), promotion in a business organisation can be defined as a management practice for recognizing and rewarding employee effort and contribution to the organisation. It is usually represented with a change of job and title and can be attached with an increase in pay, power and responsibility. Marian et al. (1995) also suggested that promotions to jobs provide the job challenge to employee with new responsibility and work contents. In most organisations, promotion decisions are generally made on the basis of seniority or ability or both (Indahwati and Brian, 2001). As a mean of relating promotion systems to job rotation practices, ability can be defined as a combination of skill, knowledge, attitude, behaviour, performance, production and talents.

Knowledge and Skills

According to Sally (1997), most people have a common understanding of skill but defining precisely what is meant by skill is problematic. Historically, skill has been associated with being skilled, having gone through a long period of training. Some researchers demonstrate through empirical research that knowledge and skills are frequently used as a basis for employee development (Tesluk and Jacobs, 1998; Uzoamaka et al., 2000). For example, Tesluk and Jacobs (1998), addressed knowledge and skill development as the direct outcomes of work experience. Several researchers have also classified various types of skills that are associated with on the job experience (Campion, et al., 1994; Thamhain, 1992; Burke and Moore, 2000). For example, Campion et al. (1994) mentioned knowledge and skills outcomes into administrative knowledge, technical knowledge and skills and business knowledge. Their findings suggest that knowledge and skills were improved by job rotation. Employees with high rates of rotation perceived greater improvement in various disciplines of knowledge and skills. These dimensions of skills also indicated in the study by Thamhain (1992) in an effort to examine engineering management skills, which included an enhanced of administrative skills, namely, ability to organize multifunctional program, attracting and holding quality people and so forth.

Career Management

The concept of career management can be defined in various ways. For example, Noe (1996) in his study on career management in the information technology sector defined career management as career exploration, development of career goals and career strategy implementation. Meanwhile, according to Christopher (1994), individual career management refers to the employees efforts to advance their own career goals. This effort is made in order to maximize career development provided to satisfy their personal career goals and achievements. For the purpose of the study, career management refers to the benefits and costs that association to the job rotation practices in the workplace (Campion et al., 1994). Essentially, individual career management outcomes here refers to the process of identifying what the benefits and costs that relate to job rotation in order to help employees in determining what steps to be taken to realize their career goals.

RESEARCH FRAMEWORK

The theoretical framework for this research was adapted from the Campion et al. (1994) model, which described the relationship between job rotation and career development outcomes inside the finance department of a large United State pharmaceutical company (illustrated in Figure 1). The primary variable of interest in the study was the independent variable of job rotation. The conceptual model classifies the job rotation practices according to employee interest. The model also suggests that employee career development outcomes, namely, career progression, employee knowledge and skills and career management are the dependent variables or potential outcomes that have been identified as associated with job rotation.

Figure 1: Research Framework for Job Rotation and Employee Career Development

Source: Adapted from Campion, Cheraskin and Stevens (1994:26)

METHODOLOGY

Research Instruments

Four indicators were used in the study to measure the constructs of interest. They included measures of the job rotation practices, career progression outcomes, knowledge and skills and career management.

Measurement of job rotation

Job rotation was measured using employee interest towards job rotation, adapted from Campion et al. (1994). Self-reported interest in job rotation was measured by employee interest in general and it was measured with a four (4)-item interval scale. For instance, "I am generally in favour of job rotation for training and development".

Measurement of career progression

Career progression is indicated by employee perception towards promotion opportunity within an organisation. Perceptions of promotion opportunity were assessed with a six (6)-item scale constructed by Marian et al. (1995). Sample items in the interval scale type include, "Job rotation creates an environment that enables me to grow in my career"

Measurement of knowledge and skills

For the present study, knowledge and skills related to job rotation practices were assessed using three indicators namely, administrative knowledge, technical skills and business knowledge. The administrative knowledge were assessed with a five (5)-item scale and both the technical skills and business knowledge were measured with a four (4)-item scale adapted from a work by Campion et al.

Measurement of career management

Career management is indicated with the benefits and costs of job rotation, all adapted from Campion et al. (1994). The benefits of job rotation were measured using four (4) categories (categorized as an interval scale), which include career effect, organisation integration, stimulating work and personal development. The costs were clustered into three categories which are workload and decrease productivity, learning curve, and satisfaction and motivation.

Population and Sampling

The target population for the present study is all the production workers in the Japanese electronic companies based in Malaysia. The database for the Japanese companies was extracted from main directories, namely, the Japan External Trade Organisation (JETRO) 2001, which provides a list of Japanese manufacturing companies operating in Malaysia. According to JETRO (2001) and Raduan (2002) there are 1346 Japanese subsidiary companies operating in Malaysia. Specifically, 722 of the companies were manufacturers and 624 non-manufacturers. The target population of production workers to be investigated in the study was restricted to 335 Japanese electronic companies in Malaysia (JETRO, 2001). In the present study, production workers refer to those working in a manufacturing production line, managing a production line and who reported to the Production Managers (Riding and Mortimer, 2000). Therefore, the sampling frame in the current study includes line operators, technicians, production line supervisors and group leaders (Raduan, 2002). The units of analysis were individuals.

Data Collection

The pilot study was conducted by distributing twenty-five samples of questionnaires at the SMK Electronics (Malaysia) Sdn. Bhd. Beranang Industrial Estate, Selangor. Out of 25 questionnaires distributed, 22 were returned and only 20 were determined to be reliable and used for analysis.

A total of 1500 questionnaires were distributed to sample of production workers in 335 of Japanese electronics companies in Malaysia by using random sampling. For each mailed questionnaire, a personalised cover letter was attached together with a reply paid self-addressed envelope for their convenience. A total of 225 questionnaires were returned to represent the sample of this study, which is a response rate of 15%. However, 16 responses were eliminated due to excessive missing data. Therefore, the reliable sample size for present study was 209.

Reliability

A reliability test was done on seven variables of interest, namely, job rotation, career progression, knowledge and skills outcomes (administrative, business and technical) and career management (benefits and costs). As shown in the Table 3.1 below, the Cronbach's Alpha obtained for job rotation was 0.7367, followed by administrative knowledge (0.8262), business knowledge (0.6943) and technical skills (0.6248). Meanwhile, the Cronbach's alpha for both benefits and costs was 0.9165 and 0.8366 respectively.

Table 1: Result of Reliability Analysis Test Based on the Alpha Scale

Variables	Number of Items	Alpha Value
Job Rotation	4	0.7367
Career Progression	6	0.8214
Administrative Knowledge	5	0.8262
Technical Skills	4	0.6943
Business Knowledge	4	0.6248
Benefits	18	0.9165
Costs	14	0.8366

RESULTS

Profile of Respondents

In this study, Table 2 below shows that most of the respondents were female (67.5%) as opposed to male (32.5 %). The total respondents were 209 production workers consisting of 141 females and 68 males. Female workers were make up the majority of production workers in Japanese electronic manufacturing companies, which accounts for 35% more than male workers. Further more, the majority of the production workers were aged 26 to 30 years (38.3%), followed by those aged 21 to 25 years (26.8%) and those aged 31 to 35 years (21.5%). As far as tenure is concerned, it showed that most of the respondents have been working with the company for one to three years (31.1%). The results show that 30.6%, of the respondents have been working for four to six years, followed by 29.2% of production workers who have been working for seven to ten years with the companies surveyed. Finally, the percentage of the respondents who have been working for ten years and more is the lowest at 9.1%. With respect to level of education, 36.4% of the respondents have SPM/STPM qualification, followed by diploma holder (11.0%) and degree qualification (1.4%). A total of 50.7% of the respondents did not managed to complete their lower secondary and/or primary education (lower than high school).

Table 2: Profile of respondents

PROFILE OF RESPONDENTS	PERCENTAGE (%)
1. Gender	
a) Male	32.5
b) Female	67.5
2. Age	
a) 16-20 years	4.3
b) 21-25 years	26.8
c) 26- 30years	38.3
d) 31-35 years	21.5
e) > 35 years	9.1
3. Number of years serving	
a) 1-3 years	31.1
b) 4-6 years	30.6
c) 7-10 years	29.2
d) More than 10 years	9.1
4. Level of education	
a) Lower than high school	50.7
b) SPM/STPM	36.4
c) Diploma	11.0
d) Degree/Bachelor	1.4
e) Others	0.5

Relationship Between Job Rotation And Career Development

Pearson Correlation was conducted between the job rotation and all dimensions of career development. The results were shown in Table 3. As seen from the results, all dimensions of employee career development were correlated with job rotation. Only costs outcome was not correlated with job rotation. With regard to correlation between job rotation and career progression, the results show that the job rotation practice is positively correlated with career progression at 0.01 confidence level and scored the highest coefficient correlation value (r=0.417).

The Pearson Correlation also proved that there is a significant relationship between job rotation and employee perception towards technical, business and administrative outcomes. The correlation coefficient value is 0.268 for technical skill, followed by 0.268 for business and 0269 for technical outcomes (p=0.00). Pearson Correlation was also conducted between the career management outcomes that is benefits and costs. As shown in Table 3, only benefits was correlated with job rotation (r=0.384). The results show that the job rotation is positively correlated with employee perception towards job rotation benefits at 0.01 confidence level. On the contrary, cost does not correlated with job rotation (r=-0.079).

Table 3: Results of Pearson Correlation between Job Rotation and Dimensions of Career Development (n= 209 Production Workers)

Job rotation	Correlations	sig. (1 tailed)
Career Progression	0.417**	.000
Technical	0.248**	.000
Business	0.268**	.000
Administrative	0.269**	.000
Benefits	0.384**	.000
Costs	-.079	.258

Note: ** $p \leq 0.01$ level (1-tailed)

DISCUSSIONS

The present study was set out to examine the relationship between job rotation and career development outcomes among production workers in Japanese electronic manufacturing companies in Malaysia. The data from 209 respondents was collected through a standardised questionnaire distributed to all respondents with the help of the human resource personnel in those companies.

Relationship Between Job Rotation And Career Progression

With regard to the relationship between job rotation and employee perception towards career progression outcome, the Pearson Correlation analysis found that there was a significantly positive correlation (r=0.417) between both variables. The finding had shown that production workers tended to perceive a greater interest in participating in job rotation, which is associated with their perception of getting promoted within the organisation. The relationship between job rotation and promotion opportunity was able to provide further support in suggesting that employees with a high level of interest in participating in job rotation are more likely to have a higher desire for a better position in the organisation. The positive relationship between both variables was consistent with the findings from studies by Campion et al. (1994) and Kusunoki and Numagami (1998), which confirmed that the rate of job rotation was significantly positively correlated with employee promotion as well as salary growth.

Relationship Between Job Rotation And Knowledge And Skills

Another objective of this study was to examine the relationship between job rotation and employee perception towards knowledge and skills outcomes. It was found that the overall link between job rotation and knowledge and skill perception was significant. It appears from the study that job rotation had significantly positively correlated with three categories of knowledge and skill outcomes which are technical skill (r=0.248), business knowledge (r=0.268) and administrative knowledge (r=0.269). However, this finding was not consistent with a study by Campion et al. (1994) which indicated a significant positive correlation for administrative and business skills, but not for technical skill.

Relationship Between Job Rotation And Benefits And Costs

With regard to the job rotation and its benefits relationships, the finding of the study shows that employees who perceived a greater interest in participating job rotation had reported greater benefits on its (r=0.384). Campion et al. (1994) noted that employee interest in participating in job rotation would influence their perception towards its benefit. Moreover, London (1983) indicated that employees who participate in job rotation might have a greater understanding on various scopes of job functions, duties and responsibilities.

This present study also attempted to test the relationship between job rotation and employee perception toward its costs. The Pearson Correlation test shows that job rotation does not correlate with employee perception toward its costs. In other words, employee interest in job rotation was not significant with their perceptions towards its costs. The finding was consistent with Campion et al. (1994), whom noted that employee interest and experience in job rotation had no effect on their perception toward its costs.

IMPLICATIONS AND CONCLUSIONS

Several implications for managers and executives may be drawn from the current research. Firstly, the research finding show that job rotation had significantly correlated with employee perception towards promotion opportunity. From this standpoint, human resource executives can draw a clear understanding of the essential influence of job rotation on employee promotion decisions. As suggested by Sullivan and Au (1998), job rotation provides an incentive to the organisation to promote workers form within, accompanied with the sets of skills needed for a higher-level position in the organisation. At the same time, job rotation provides information that the organisation can use to improve the allocation of jobs among employees. In other words, it may be easier for the management team to determine the most appropriate job for that worker.

Secondly, the emphasis on the knowledge and skill employed by employees in the workplace is also open for a new approach in designing and implementing job rotation practices. As suggested by Campion et al. (1994), organisations could more proactively design and manage job rotation as a main component of employee career development programs. In line with this, it is essential to note that job rotation should be managed as a main component of organisation OJT and career development systems. Human resource executives should have a clear understanding of exactly which skills can be enhanced by placing employees into the job rotation practices. In this effort, organisations should be able to address skills that are not enhanced by job rotation through other training programs like cross-training, coaching and various types of off-the job training.

On the other hand, several implications for theoretical contributions may also be drawn from the current study regarding job rotation and career development. Firstly, the positive correlation between job rotation and employee perception towards career development outcomes such as promotion opportunity and knowledge and skill outcomes indicated that there is a tendency among production workers to improve their current career in the organisation by actively participating in job rotation. Therefore, with regard to a model of career development developed by Wright and Belcourt (1994), job rotation can be used as a part of organisational strategy to improve employee core skills and self-development. According to this model, training activities needed to be taken according to the stage in the employee's career/position or the changing needs of both the organisation and individual. With respect to production workers, it can begin with a well-developed job rotation program for employees in early career (low tenure) and continue throughout their career in the organisation as a part of a career development process.

The practice of job rotation in the workplace has played an essential role in employee development. All employees in various manufacturing industries should be encouraged to actively participate in job rotation. With regard to the relationship between job rotation and career development prospects, it can be concluded that the practice of job rotation in the organisation can create a lot of opportunities for employees to gain necessary skills and knowledge needed in their future career. First emphasis should be given on educating employees about the importance of job rotation as part of their career development interventions. There is no point if the benefits from the practice of job rotation cannot be transformed into employee career development. As an effective means of developing employee career, it has become necessary for Japanese companies to perform job rotation among its employees

REFERENCES

Burke, L.A. and Moore, J.E. (2000). *The reverberating effects of job rotation: a theoretical of non-rotates fairness perceptions*. Human Resource Management Review. 10(2), 127-152

Campion, M..A., Cheraskin, L. and .Stevens, M.J. (1994). *Career-related antecedents and outcomes of job rotation*. Academy of Management Journal. 37, 1518-1542

Christopher, O. (1994). *The effects of organizational and individual career management on career success*. International Journal of Manpower. 15(1), 27-37

Cosgel, M.A and Miceli, T.J. (2000). *Job rotation: costs, benefits and stylized facts*. Journal of Institutional and Theoretical Economics. 21, 234-257

Indahwati Gunawan Go and Brian, H.K. (2001). *How to manage promotion decisions effectively*. Management Research News. 24 (3/4), 109-112

Kirk, J.J., Downey,.B., Duckett, S., Woody, C. (2000). *Name your career development intervention*. Journal of Workplace Planning. 12(5), 205-216

Khairul Aidil Azlin A. Rahman, Kazuo Sugiyama and Makoto Watanabe (2000). *Design management style practices that contribute towards knowledge conversion, a preliminary study from industrial design perspective in Malaysia.* Bulletin of 5th Asian Design Conference

Koike, K. (1984). *Skill formation systems in the U.S. and Japan: a comparative study.* In Cosgel, M.M. and Miceli, T.J. (Eds). The Economic Analysis of the Japanese Firm, North Holland: Amsterdam, 47-75

Kusunoki, K. and Numagami, T. (1998). *International transfer of Engineers in Japan: Empirical findings and implications for cross-sectional integration.* In Eriksson, T. and Ortega, J. (2001) (Eds.), Paper Presented at Universidal Publica de Navana, 2001

Lain Wan, H. (2001). *Education and training in the auto manufacturing industry: a comparative analysis between Japan and Malaysia.* Human Resources for Health Development Journal. 5(1-3), 39-46

Leibowitz, Z.B., Farren, C. and Keye, B.L. (1988). *Designing career development system.* In In Appelbaum, S.H., Ayre, H. and Shapiro, B.T. (2002) (Eds.), Career Development International. 7(3), 142-158

London, M. (1983). *Toward a theory of career motivation.* Academy of Management Review. 8(4), 620-630

Marian, N.R., Patricia, J.O. and Kathy, E.K. (1995). *Promotion decisions as a diversity practices.* Journal of Management Development. 14(2), 6-23

Noe, R.A. (1996). *Is career management related to employee development and performance*? Journal of Organizational Behaviour. 51(4), 41-44

Noe, R.A. and Ford, J.K. (1992). *Career building: learning from cumulative work experience.* Career Development in Organisations. 7, 45-52

Olorunsula, R. (2000). *Job Rotation in academic libraries: the situation in Nigerian university library.* Library Management. 21(2), 94-98

Ortega, J. (1999). *Job rotation as a mechanism for learning.* Working paper for Labour Market and Social Research.

Raduan Che Ros (2002). *Japanese Style-Management Abroad: the case of Malaysian subsidiaries.* Prentice Hall.

Riding , R. and Mortimer, J. (2000). *A study of the on-the-job training of production line operatives in manufacturing companies.* International Journal of Training and Development. 4(2), 111-122

Sally, D. (1997). *Changing skill needs: what makes people employable.* Industrial and Commercial Training. 29 (6), 190-193

Sullivan, J. and Au, S. (1998*). Developing world class job rotation programs to improve retention* (On-Line). Available http:/www.drjohnsullivan.com

Susan, S.D. (1996). *The new story about job rotation.* Academy of Management Executive. 10(1), 86-88

Tesluk, P.E. and Jacobs, R.R. (1998). *Toward an integrated model of work experience.* Personnel Psychology. 51(2), 321—355

Thamhain, H.J. (1992). *Developing the Skills You Need.* Research Technology Management. 35(2), 42

Uzoamaka, P.A., James, C.H. and Susan, M.S. (2000). *Knowledge-related skills and effective career management.* International Journal of Manpower. 21(7), 566-579

Wright, P.C. and Belcourt, M. (1994). *Management development: a career management perspective.* The International Journal of Career Management. 6(5), 3-10

The Effects of Trainees' Attitudes and Perception of Support on Training Outcomes

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ABSTRACT

Training could be a costly investment with little assurance of returns. Thus, the issue of training effectiveness has remained significant for investment considerations of any organization. Earlier studies on training effectiveness and transfer dwelt a lot on factors related to training designs and conditions. However, towards the end of the 1980's, researchers began to show interest in the study of attitudinal and environmental factors that may affect training outcomes. This shift of focus reflects the realization among theorists and researchers that there are human-related and environmental factors that could have affected the learning and transfer process resulted from training experiences. In this study, a training course on 5S housekeeping practices in industrial operations is conducted for about 80 operations workers and supervisors from a total of six manufacturing organizations in Sabah. Measures of trainees' attitudes – self-efficacy, expectancy, job involvement, organizational commitment – and perception of support – job support, managerial and supervisory support, and organizational support are taken before the training. Training outcomes are measured in terms of trainees' reactions to the training, the extent of learning, and the attempt to apply the trained skills at work. Multiple regression analysis is conducted to determine how the above factors affected the training outcomes.

INTRODUCTION

Training could be a costly investment with little assurance of returns. In early 1980's, Georgenson (1982) suggested that probably only 10% of the US$100 billion spent on training and development in USA led to positive transfer. In their study, Baumgartel, Reynolds, and Pathan (1984) found that less than half of their subjects reported significant attempt to transfer training to job environment after training. Marx (1986) suggested that transfer failure might be as high as 90%. In the similar note, Broad and Newstrom (1992) suggested that more than 80% of investment in training is ultimately wasted. Positive returns are not guaranteed for training investment without proper understanding of the training transfer process. Gist and Stevens (1998) proposed that two outcomes contribute to improved returns on training expenditures:

- the maintenance of skilled performance over time, and
- the transfer of skilled performance to related tasks and alternative contexts.

Earlier studies on training effectiveness and transfer dwelt a lot on issues of training designs and conditions. Wexley and Baldwin (1986) described some traditional transfer strategies – conducting training in such a way to:

- facilitate learning of not just applicable skills, but also general rules and theoretical principles underlying the training contents – teaching underlying principles; and
- facilitate use of newly acquired skills in a different work environment – learning underlying principles.

Towards the end of the 1980's, researchers began to show interest in the study of factors besides those related to training designs and conditions. Noe (1986) called for more attention for attitudinal and environmental factors that may affect training transfer. Campbell (1988) stressed that individual and situational variables could all have impact on the ultimate effectiveness of the training program. Baldwin and Ford (1988) acknowledged the significance of trainee characteristics and work environment on training transfer. Foxon (1993) reviewed more than 30 articles to identify 128 factors – organizational climate factors accounted for 42% of all the factors, individual learner characteristics accounted for 22% (motivation alone accounted for 13%), and training design and training delivery factors made up the rest – that inhibit training transfer. . This indicates the significant attention given to the study of attitudinal and environmental factors affecting transfer of training in recent years.

ATTITUDINAL INFLUENCES ON TRAINING OUTCOMES

Besides instructional effectiveness, training contents, and other training design factors, effectiveness of training programs can be influenced directly or indirectly by the attitudinal affinity of the trainees (Baldwin & Ford, 1988; Campbell, 1988; Foxon, 1993; Noe, 1986).

Self-Efficacy

Noe (1986) acknowledged that self-efficacy is an important factor contributing to trainees' motivation to learn in a training experience. Empirical evidence of its contribution to trainees' motivation, and their application and maintenance of trained skills had been found (Gist, Stevens, & Bavetta, 1991; Tracey, Hinkin, Tannenbaum, & Mathieu, 2001). Trainees who are more certain about their ability to cope with the training experience are more likely to learn from it, and transfer the skills learned to their daily work.

Expectancy

Expectancy is the perception that a certain effort will result in outcomes of a particular form. Vroom's (1964) Expectancy Theory suggests that individuals are more motivated if they develop positive expectation of outcomes that are desirable to them. The stronger one's perception that the expected outcomes will follow the effort, the more likely it is for him or her to work hard towards it. Effort-performance and performance-reward expectancies drive individuals in their decisions to take certain courses of action to improve work effectiveness, job behaviors and performance (Arvey, 1973; Hackman & Porter, 1968; Lawler & Suttle, 1973).

In the training context, trainees with stronger expectancies are expected to be more motivated to learn than those with weaker expectancies (Elangovan & Karakowsky, 1999; Noe, 1986; Noe & Schmidt. 1986). This would eventually affect trainees' initiatives and efforts to learn in a training program (Pritchard & Sanders, 1972).

Desirable incentives are considered to be instrumental in influencing one's expectancies and thus the subsequent performances. In some studies, it was observed that subjects were able to distinguish between intrinsic and extrinsic incentives, and that expectancy for intrinsic incentives appeared to have stronger effect on motivation than expectancy for extrinsic incentives (Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Lawler & Suttle, 1973).

Job Involvement

Lodhal and Kejner (1965) defined job involvement as "…the degree to which a person's work performance affects his self-esteem" (p.25). It is acknowledged as a factor likely to directly or indirectly influence training outcome and transfer (Cheng & Ho, 2001b; Elangovan & Karakowsky, 1999; Noe, 1986; Noe & Schmitt, 1986). Job involvement was found to have significant influence over learning, and that highly job-involved trainees are likely to acquire more knowledge as a result of participation in training than those who are less job-involved (Noe & Schmitt, 1986). Job involvement was also found to have positive influence over pre-training self-efficacy, which then influences pre-training motivation, and subsequently training reactions and learning outcomes (Tracey et al., 2001).

Organizational Commitment

Organizational commitment had been defined as "…the relative strength of an individual's identification and involvement in a particular organization" (Mowday, Steers, & Porter, 1979, p.226). This definition implies that individuals in an organization with higher level of commitment to the organization are more likely to put in efforts to add value to the organization. It follows that those who are more committed to their organization may devote more efforts to master training contents in training experiences designated by the organization and to apply learned knowledge and skills to the job, believing that such efforts would enhance the effectiveness of the organization. Empirical evidence for such relationship was found in several studies (Cheng & Ho, 2001b; Facteau et al., 1995; Tracey et al., 2001).

TRAINEES' PERCEPTION OF SUPPORT

Apart from trainees' attitudes, their perception of support at work may affect training outcomes as well. Noe (1986) proposed that environmental favorability – in terms of both task constraints and social influences – might affect trainee's motivation to learn and motivation to transfer. One of the categories of training input factors in Baldwin and Ford's (1988) model – besides trainee characteristics and training design – is work environment. Trainees who return to their work after a training experience are more likely to be able to apply what they have learned if they have a supportive work environment. Trainees who perceived their work environment as supportive may also be more willing to learn in training and apply the learned skills on the job after that.

In their study, Tracey, Hinkin, Tannenbaum, and Mathieu (2001) measured work environment in three dimensions covering both the task and social contexts:

- Managerial support: supervisor's relationship with subordinates and their support for training, etc.;
- Job support: opportunity to apply trained tasks on the job; and
- Organizational support: formal organizational system – appraisal, reward, accountability for training, etc.

They found significant evidence that work environment – as a composite of the three dimensions – contributed to trainees' pre-training self-efficacy, which influenced pre-training motivation and subsequently the training outcome measures.

Job Support

Peters and O'Connor (1980) proposed that situational constraints might hinder desirable work outcomes. At the workplace, trainees who intend to apply trained skills on the job may be hindered from doing do by various job-related constraints. They have listed down eight categories of possible situational constraints that may limit work performance - job-related information, tools and equipment, materials and supplies, budgetary support, required services and help from others, task preparation, time availability, and work environment. In the training context, the extent to which trainees are able to apply trained skills on the job may be affected by the situational constraints experienced at their workplace. Situational constraints perceived by trainees would negatively affect their motivation to learn and the development of their self-efficacy over training (Mathieu, Martineau, & Tannenbaum, 1993; Mathieu, Tannenbaum, & Salas, 1992).

Supervisory Support

It is quite commonly acknowledged that supervisory support may influence trainees' effort to apply trained skills on the job (Baldwin & Ford, 1988; Elangovan & Karakowsky, 1999; Ford & Weissbein, 1997). Positive supervisory behavior may influence perception of support by trainees and thus affect their intention to transfer trained skills. Ford, Quinones, Sego, and Sorra (1992) found that supervisor's attitudes as perceived by trainees have influence over the degree to which trained tasks were performed at work. Foxon (1997) observed that both anticipated management support – trainee's anticipation of management support just after a training experience – and reported management support – degree of management support reported by trainees three months after returning to work – have impact on motivation to transfer and measures of training transfer. Van der Klink and Streumer (2002) made similar observation in their study – management support perceived by trainees appeared to be a significant predictor of behavior transfer.

Organizational Support

Eisenberger, Huntington, Hutchison, and Sowa (1986) suggested that individuals tend to form "…global beliefs concerning the extent to which organization values their contributions and cares about their well being" (p.501). It is likely that trainees' perception of organizational support may influence their motivation to learn and to transfer learned skills. Tracey, Tannenbaum, and Kavanagh (1995) found that organizational culture for continuous improvement has significant impact on post-training behavior. Organizational support was included as one of the dimensions of work environment in the study by Tracey and others (2001), and they found that work environment contributed positively to pre-training self-efficacy.

TRAINING OUTCOMES

Research efforts in relations to training evaluation often make references to Kirkpatrick's (1967, 1987, 1994) model of the levels of training outcomes. For the purpose of training evaluation, Kirkpatrick proposed four criteria:

- Reactions : trainee's "liking of" and "feelings for" a training program;
- Learning : principles, facts, and techniques understood and "absorbed" by trainees;
- Behavior : the application of learned principles and techniques on the job, resulting in a change in job behavior; and
- Results : overall performance improvement demonstrated by trainees, contributing to organizational results.

Over the years, researchers had referred to this model for training evaluation studies. In recent years, the hierarchical structure of Kirkpatrick's model had received quite some criticism. Some researchers reviewed large number of articles on training evaluation to find little evidence of interrelationship between the four criteria (Alliger & Janak, 1989; Alliger, Tannenbaum, Bennett, Traver, & Shotland, 1997). Kraiger, Ford, and Salas (1993) criticized Kirkpatrick's model for its:

- Lack of clarity regarding what specific changes to be expected as functions of trainee learning; and
- Difficulty in identifying what assessment techniques is appropriate.

Many shared the feelings that training outcomes should be measured in more operationalized forms. For instance, training reactions have been recommended to be measured in various sublevels (Alliger et al, 1997):

- Affective reactions : liking of and feelings for the training experience; and
- Utility reactions : perceived relevance, utility value, or usefulness of training for subsequent job performance.

Some proposed that learning outcomes should be measured more comprehensively, covering the cognitive, skill-based, and affective domains and their various sublevels (Gist & Stevens, 1998; Kraiger et al., 1993).

Another aspect of training outcomes to take note is training transfer – the attempt to apply trained skills on the job after training. In this context, objective and criterion measures of behavioral performance were often recommended against self-reported measures (Baldwin & Ford, 1988; Cheng & Ho, 2001a; Ford & Weissbein, 1997). This is attempted empirically by researchers through comparison of pre-training and post-training work samples (Mathieu et al., 1992), organizational appraisal exercise (Orpen, 1999), and practical or simulated sessions (Gist & Stevens, 1998; Gist et al., 1991; Mathieu et al., 1993). Baldwin and Ford (1988) had stressed the importance of establishing trainees' baseline of skill/knowledge/behavior before entering the training experience, so that the behavior change resulted from the training can be reasonably deduced.

THEORETICAL FRAMEWORK

The purpose of this study is to determine how trainees' attitudes and perception of support affect training outcomes. Subjects are 81 trainees in a training course on "5S Housekeeping Practices for Industrial Operators".

Training outcomes are considered in terms of training reactions, learning, and training transfer in this study. Training reactions are measured in terms of :

- Affective reactions: trainees' feelings for the training experience; and
- Utility reactions: trainees' perception of how relevant the training contents are to be applied at work.

Learning is considered in terms of gain in declarative knowledge and application-based knowledge as a result of the training course. Declarative knowledge is the concepts and facts related to the course contents. Application-based knowledge is the cognitive ability to apply relevant principles to specific work situations. Training transfer is observed as the behavioral change resulted from the training course. The attitudinal factors considered in this study are self-efficacy, expectancy, job involvement, and organizational commitment; and the support factors in consideration are job support, supervisory support, and organizational support respectively.

The theoretical framework of this study is built upon the premises that trainees' attitudes and perception of support would affect training outcomes – reactions, learning, and transfer; and that trainees' training reactions would affect learning, and subsequently training transfer. These relationships are illustrated as follows:
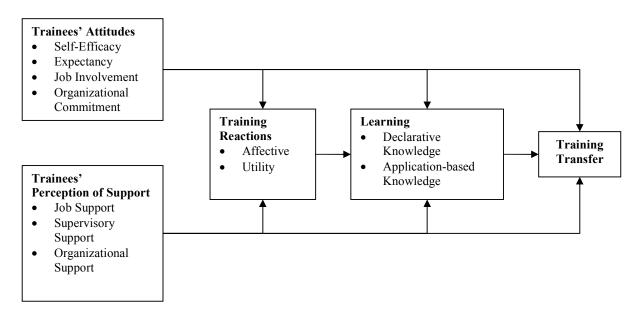
Figure 1: Theoretical Framework of the Study

RESEARCH HYPOTHESES

Based on the theoretical framework of the study, trainees' attitudes and perception of support are expected to affect training outcomes. The related hypotheses are:

H1: *Trainees' attitudes – self-efficacy, expectancy, job involvement, and organizational commitment –and perception of support – job support, supervisory support, and organizational support – will significantly affect their affective and utility reactions to the training course.*

H2: *Trainees' attitudes – self-efficacy, expectancy, job involvement, and organizational commitment –and perception of support – job support, supervisory support, and organizational support – will significantly affect the gain in their declarative and application-based knowledge.*

H3: *Trainees' attitudes – self-efficacy, expectancy, job involvement, and organizational commitment –and perception of support – job support, supervisory support, and organizational support – will significantly affect the level of training transfer.*

It is also expected that trainees' reactions to training would affect their learning, and subsequently training transfer:

H4: *Trainees' affective and utility reactions to the training course will affect the gain in their declarative and application-based knowledge.*

H5: *Trainees' affective and utility reactions to the training course will affect their level of training transfer.*

H6: *Trainees' gain in declarative and application-based knowledge will affect their level of training transfer.*

INSTRUMENTS

Several instruments are used for data collection in this study. Trainees' attitudes and perception of support are measured by the Trainees' Entry Condition Survey (TECS). Training reactions are measured by the Training Reactions Survey (TRS). Pretest and posttest scores are used to determine learning. Training transfer is represented by the difference in scores recorded using the 5S Behavior Checklist before and after the course.

Trainees' Entry Conditions Survey

TECS in its final form contains 30 items to measure trainees' self-efficacy, expectancy, job involvement, organizational commitment, job support, supervisory support, and organizational support. The items are presented in 7-point Likert scale, requiring subjects to indicate how agreeable they are to the statement of each item.

Development of TECS

The scales to measure self-efficacy, job involvement, organizational commitment, and organizational support are adopted from previous studies. Items to measure self-efficacy were selected from the 17 items in the General Self-Efficacy Scale developed by Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982), with Cronbach's alpha coefficient determined to be .86. Items to measure job involvement were taken from the 20 items developed and validated by Lodhal and Kejner (1965) – split-half reliability ranging from .56 to .80. Organizational commitment is measured using items developed by Mowday, Steers, and Porter (1979) , of which Cronbach's α was found to range from .82 to .93, with relatively high test-retest reliability (r = .53, .63, and .75) over two-, three-, and four-months period. Items to measure perceived organizational support were among the 16 items developed by Eisenberger, Huntington, Hutchison, and Sowa (1986), yielding Cronbach α = .93 in the process of validation.

It is necessary to develop items for measuring expectancy specifically related to a training experience. To develop these items, a list of expected outcomes can be obtained from some of the subjects qualitatively as some researchers did (Hackman & Porter, 1968; Pritchard & Sanders, 1972). In this study, 15 employees from two organizations in Kota Kinabalu were gathered in three discussion groups – about five in a group. Brainstorming with these subjects yielded several indicators of possible trainees' expectancy. As some studies had pointed out, expectancy for intrinsic incentives may have stronger effect on motivation that expectancy for extrinsic incentives (Facteau et al., 1995; Lawler & Suttle, 1973), so items developed to measure expectancy in this study focused more on intrinsic incentives. Sixteen items were developed for TECS to measure expectancy based on the information gathered.

Reviewed studies form the basis for the development of items measuring job support and supervisory support. The eight categories of task-related resources proposed by Peters and O'Connor (1980) were used to develop 16

items to measure trainees' perception of job support. The points presented in Foxon's (1997) list of supportive/non-supportive behaviors of managers were used to develop 16 items to measure trainees' perceived supervisory support. This made the total number of items in the TECS 116 items.

Validation of TECS

A total of 116 items measuring trainees' attitudes and perception of support was administered to 95 employees in six organizations in Kota Kinabalu for pilot test.

Multicollinearity is a possible threat in this study as it involved quite a number of independent variables, as seen in some similar studies (Cheng & Ho, 2001b; Facteau et al., 1995). Some precautionary steps need to be taken to prevent such complication. Thus, factor analysis was conducted on the data collected to:
- Identify items with high factor loading for each factor; and
- Eliminate items with high factor loading for more than one factor as practiced by some researchers (Shore & Wayne, 1993).

The 30 items finally selected include four items in each subscale to measure self-efficacy, job involvement, organizational commitment, perceived job support, and perceived organizational support, and five items for each subscale measuring expectancy and perceived supervisory support. The Conbach's alpha value of the subscales ranged from .6506 (job involvement) to .8941 (perceived supervisory support). A number of sample items in TECS are shown in Table 1.

Table 1: Sample Items in Trainees' Entry Conditions Survey

Factor	Sample Item
Self-Efficacy	I give up on things before completing them.
Expectancy	I become more confident with my job abilities if I go through training.
Job Involvement	Most things in life are more important than work.
Organizational Commitment	I am proud to tell others that I am part of my organization.
Job Support	I can easily get information about how to do my job in my organization.
Supervisory Support	My supervisor is often interested in what I have learned from training programs.
Organizational Support	My organization fails to appreciate any extra effort from me.

Training Reactions Survey

TRS is used to measure trainees' affective and utility reactions to the 5S training course. Twelve items had been initially developed for this purpose – six items for affective reactions, and another six for utility reactions. These items are pilot tested on 59 postgraduate students attending distance learning programs in Kota Kinabalu. Factor analysis was carried out to identify eight items – four for each domain of training reactions – to be included in the final form of the instrument. Examples of these items are:
- I find the course really interesting. (Affective reactions)
- The course contents and activities are relevant to my work. (Utility reactions)

The scales of four items each for trainees' affective reactions and utility reactions yielded Cronbach's alpha values of .8729 and .8264 respectively in the pilot test. Like TECS, the selected items are included in the TRS in 7-point Likert scale format.

Pretest and Posttest

The pretest and posttest are parallel tests developed based on the contents of the 5S training course. Each test contained 25 questions in two sections testing trainees' knowledge on training contents covered in the 5S training course. Section A contained 15 multiple-choice items testing trainees' declarative knowledge, and Section B contained 10 items testing trainees' application-based knowledge. Questions in Section A tests trainees' recall and comprehension of the course contents, for example:

The 5S system is beneficial to industrial operations because it :
- reduce cost of production.
- produce skillful workers.
- cultivate team spirit among workers.
- improve operational effectiveness.

Questions in Section B contained descriptions of practical work situations, requiring subjects to respond by selecting the appropriate actions from a list of alternatives, for example:

In-process inventory in Section 4 often piles up in an area near to machine Alpha-1 while waiting to be processed. Sami feels disturbed about this situation because the pile of materials may cause problems in the workplace. What are some steps to be taken so that orderliness in the workplace can be maintained?

- Clearly label the materials.
- Paint lines and box around the area when the materials are often left.
- Cover the materials with lining or plastic.
- Ensure that the materials are clear off the walkway and paint divider lines to show the path clearly.

5S Behavior Checklist

This study adopts the recommendations to obtain objective and criterion measures of behavioral performance against self-reported measures (Baldwin & Ford, 1988; Cheng & Ho, 2001a; Ford & Weissbein, 1997). The trainees' related behaviors are measured using a checklist developed for the purpose. The 5S Behavior Checklist contained 20 items to measure specific trainee behaviors in three specific areas – organization (*Seiri*), orderliness (*Seiton*), and cleanliness (*Seiso*). Trainees' behaviors are observed through indicators such as whether there are visible indications of

- needed and unneeded items,
- storage places for items, and
- cleanliness procedures and actions at their workplace.

The items in the checklist were modified from the sample checklists presented by Hirano (1990/1995). A sample item is as follows:

Storage of items (what goes where and in what amount)
> 1-Impossible to tell
> 2-Possible (but not easy) to tell
> 3-There are general storage signs
> 4-Anyone can see at a glance

METHOD

This study adopts a pretest-posttest quasi-experimental design involving a group of trainees in a 5S training course. These trainees are operators and supervisors of seven manufacturing organizations situated in the West Coast of the state of Sabah in Malaysia.

Subjects

The subjects of this study are 81 trainees for a 5S training course. They are operators and supervisors in seven manufacturing organizations in Sabah. The organizations of the subjects were invited to participate in this study by sending their operators and operations supervisors for the 5S training course developed for this purpose. They were selected by the management of their respective organizations based on the organization's operational needs and conditions – whether the subject matter is of interest and technical benefit to the organization in general, whether it is possible to release workers from daily operations for training, and so on. So, trainees from the same organization either took turns or were relieved from their normal work shift to join the training course. This manner of selection appears to be a rather common practice for training among Malaysian organizations as observed in surveys conducted by Malaysian Institute of Management (1996) and Wong (2000).

5S Training Course

The 5S training course is developed and conducted by the researcher, who is a training consultant having experience in implementing and auditing quality systems. The course is conducted in Bahasa Malaysia, the Malaysian national language commonly used by industrial operational workers in Sabah. To accommodate operational needs of the participating organizations in Kota Kinabalu, the course was conducted in two alternative sessions in Sabah Skills and Technology Centre in Sepangar Bay, Kota Kinabalu. One other session is conducted on-site for one participating organization having a total of 26 trainees for the course. The course contents and activities for all three sessions are similar to ensure that the training design and condition are controlled.

Attitudes and Learning

Measure of trainees' attitudes and perception of support is taken by administering the TECS before each training session begin, followed by the pretest. Immediately after each course, the posttest is administered and then the TRS. The Bahasa Malaysia version of the instruments is used.

Training Transfer Measures

As an objective measure of training transfer, behavioral measures were taken at the trainees' workplace before and after the training course. Within one week before the training course, the researcher visited the trainees' workplace and made a record of the pre-training behaviors based on the 5S Behavior Checklist. This serves as the baseline behavior of the trainees before the training course (O1). Two weeks after the training, the researcher visited the trainees again to make another behavioral measure (O2). The difference between the behavioral performance scores at O1 and O2 is considered as the training transfer sustained by trainees as a result of the training course.

RESULTS

To test the hypotheses of this study, correlation and regression analysis is applied. Pearson correlations between the factors in consideration are presented in Table 2. Based on this correlation matrix, the independent variables with higher correlation with the dependent variable concerned are entered first for regression analysis. The results of multiple regression analysis using this approach are presented in Table 3.

Statistical Power Analysis – A Priori, Post Hoc, and Compromised Approaches

The sample size of 81 has statistical influence on the power of the F test in multiple regression analysis involving at least seven predictors in this study. By a priori approach, it can be determined by statistical power analysis that to conduct F test in multiple regression analysis involving seven predictors, a sample size of at least 103 is required to sustain the power of the test at 80% while applying level of significance, $\alpha = 5\%$. Post hoc approach of such analysis revealed that, by having a sample size of only 81, the power of the test is reduced to about 67% if α is to be maintained at 5%. This means that, when testing F value for seven predictors of one certain variable with a sample size of 81, the probability of rejecting the null hypothesis when it is false falls from 80% to only about 67% in order to maintain a 5% margin of error so as not to reject the null hypothesis when it is true.

Table 2: Pearson Correlation between Trainees' Attitudes, Perception of Support and Training Outcome Measures

	SE	EX	JI	OC	JS	SS	OS	AR	UR	DK	AK	TT
SE	1.000	.008	.261*	-.046	-.139	-.120	.395**	-.110	-.009	.241*	.096	-.052
EX		1.000	- .124	.578**	.373**	.498**	-.020	.500**	.374**	.014	-.001	-.016
JI			1.000	.081	.015	.277*	.271*	.161	.295**	-.048	-.241*	-.042
OC				1.000	.452**	.461**	.141	.298**	.323**	-.009	.100	.096
JS					1.000	.546**	.148	.279*	.092	.067	-.054	-.039
SS						1.000	.186	.270*	.290**	-.105	-.093	.011
OS							1.000	.093	.219*	.019	.001	-.001
AR								1.000	.658**	.056	-.060	-.059
UR									1.000	-.009	.025	.002
DK										1.000	.239*	.121
AK											1.000	.160
TT												1.000

* $p < .05$ (2-tailed)
** $p < .01$ (2-tailed)
SE = Self-Efficacy   EX = Expectancy   JI = Job Involvement   OC = Organizational Commitment
JS = Job Support   SS = Supervisory Support   OS = Organizational Support
AR = Affective Reactions   UR = Utility Reactions
DK = Declarative Knowledge   AK = Application-based Knowledge
TT = Training Transfer

Table 3: Multiple Regression Analysis – Effects of Trainees' Attitudes and Perception of Support on Training Outcomes

Hypotheses	Dependent Variable	Independent Variables	ΔR^2	Sig. F Change	Num.of Predictors	Post Hoc		Compromised	
						α	Power 1-β	α	Power 1-β
H1	AR	EX	.250*	.000	7	.05	.6672	.1546	.8454
		OC	.000	.912					
		JS	.010	.307					
		SS	.000	.837					
		JI	.013	.246					
		SE	.021**	.145					
		OS	.020**	.148					
H1	UR	EX	.140*	.001	7	.05	.6672	.1546	.8454
		JI	.063*	.015					
		OC	.017	.206					
		SS	.001	.788					
		OS	.019	.171					
		JS	.015	.229					
		SE	.022**	.139					
H2 & H4	DK	SE	.058*	.030	9	.05	.6061	.1745	.8255
		SS	.006	.487					
		JS	.029**	.123					
		AR	.007	.458					
		JI	.007	.443					
		OS	.006	.472					
		EX	.001	.782					
		OC	.000	.947					
		UR	.000	.997					
H2 & H4	AK	JI	.058*	.030	9	.05	.6061	.1745	.8255
		OC	.014	.276					
		SS	.010	.370					
		SE	.025**	.150					
		AR	.001	.802					
		JS	.005	.515					
		UR	.013	.301					
		OS	.000	.933					
		EX	.000	.847					
H3, H5, H6	TT	AK	.026**	.153	7	.05	.6672	.1546	.8454
		DK	.007	.448					
		UR	.000	.994					
		AR	.005	.515					
		SE & EX	.011	.657					
		JI & OC	.011	.659					
		JS,SS,&OS	.009	.885					

* Significant under conditions of Post Hoc analysis, p < .05
** Significant under conditions of Compromised analysis, p < Compromised α.
SE = Self-Efficacy   **EX** = Expectancy   **JI** = Job Involvement   **OC** = Organizational Commitment
JS = Job Support   **SS** = Supervisory Support   **OS** = Organizational Support
AR = Affective Reactions   **UR** = Utility Reactions
DK = Declarative Knowledge   **AK** = Application-based Knowledge
TT = Training Transfer

Erdfelder, Faul, and Buchner (1996) offered an alternative to this threat. They contended that there are often practical constraints that make it difficult for researchers to gather a large number of subjects for their studies. They proposed a compromised approach in statistical power analysis. Taking the ratio of β/α to be 1, they were able to determine the value of α and β that is applicable for the realistic sample size in consideration. For this purpose, they initiated the effort to develop a software for statistical power analysis bearing such features – G*Power (Erdfelder et al., 1996). G*Power is a DOS-based freeware for statistical power analysis, supporting three approaches of power analysis – a priori, post hoc, and compromise. It allows users to carry out power analysis by any of the three approaches based on parameters entered for various types of statistical tests. This

software is used to determine the value of α and β in the compromised situation of having a sample size of only 81 in this study.

It is important to note that when the compromised approach is taken, the risk of committed α error – rejecting the null hypothesis when it is true – in hypothesis testing will inevitably increase, although the power of the test – the probability of rejecting the null hypothesis when it is false – is maintained at a reasonably acceptable level of 80% and above. For example, when testing seven predictors in multiple regression with a sample size of only 81, compromised analysis yielded the level of significance, α to be .1546 (about 15%) for the power of the test, $1 - β$, to be .8454 (about 85%).

Post Hoc Analysis

To test the hypotheses in this study, multiple regression analysis is performed. Testing for hypothesis H1, it is found that only expectancy contributed significantly to the variance in affective reactions ($\Delta R^2 = .250$, $p < .01$), while expectancy ($\Delta R^2 = .140$, $p < .01$) and job involvement ($\Delta R^2 = .063$, $p < .05$) are found to have significantly contributed to the variance in utility reactions. Apparently, trainees' expectancy of favorable outcomes from the training course has significant impact on their affective and utility reactions for the training course; and the degree to which they are involved in their job seemed to be an important predictor of their utility reactions.

To determine the effects of trainees' attitudes, their perception of support, and training reactions on learning, the seven related factors and training reactions measures – affective and utility – are entered one by one as independent variables. The analysis revealed that only self-efficacy contributed significantly to the variance of trainees' gain in declarative knowledge ($\Delta R^2 = .058$, $p < .05$) and only job involvement contributed significantly to trainees' gain in application-based knowledge ($\Delta R^2 = .058$, $p < .05$). It is interesting to note that the effects of training reactions measures on learning were insignificant contrary to hypothesis H4.

To determine the effects on training transfer, all related factors were entered hierarchically for regression analysis based on the strength of their correlation with training transfer. Trainees' gain in application-based knowledge was entered first, followed by trainees' gain in declarative knowledge. This is followed by affective reactions and then utility reactions. Trainees' attitudes were entered in two groups. Self-efficacy and expectancy was entered first as they are considered personality-related factors. Job involvement and organizational commitment was entered next as factors related to job attitudes. Finally, all the factors related to trainees' perception of support – job support, supervisory support, and organizational support – were entered as one group. In total, seven predictors were entered as independent variables. There is insufficient evidence to support hypotheses H3, H5 and H6, which claim that these factors will have significant effect on training transfer.

In conclusion, the multiple regression analysis carried out by Post Hoc approach – with a sample size of 81 subjects, taking α to be .05, and power of F test to be .6672 (testing seven predictors) and .6061 (testing nine predictors) – revealed that:
- Trainees' expectancy has significant effect on their affective reactions;
- Trainees' expectancy and job involvement have significant effect on their utility reactions;
- Trainees' self-efficacy has significant effect on their gain in declarative knowledge; and
- Trainees' job involvement has significant effect on their gain in application-based knowledge.

These relationships are illustrated in Figure 2.
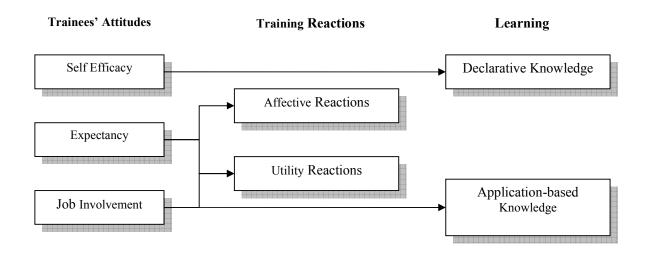
Figure 2: Model by Post Hoc Analysis

In this Post Hoc Model, it is observed that trainees' perception of support has insignificant effect on all the training outcome measures.

Compromised Analysis

Facing the constraint of having a limited sample size, the compromised approach in statistical analysis as recommended by Erdfleder, Faul, and Buchner (1996) is also carried out. As there is still much to learn about how trainees' characteristics and work environment would affect training effectiveness, some researchers pointed out the need to develop, test, and refine related theoretical models (Baldwin & Ford, 1988; Cheng & Ho, 2001a). Conducting the compromised analysis may contribute in the efforts to form a more comprehensive theoretical model on the subject of the study although the risk of errors in making conclusion about significant effects is higher than taking the Post Hoc approach.

In consideration of training reactions, it is observed that trainees' expectancy (ΔR^2 = .250, p < .1546, predictors = 7), self-efficacy (ΔR^2 = .021, p < .1546, predictors = 7), and perceived organizational support (ΔR^2 = .020, p < .1546, predictors = 7) contributed significantly to their affective reactions to the training course. In relations to their utility reactions to the training course, it is noted that expectancy (ΔR^2 = .140, p < .1546, predictors = 7), job involvement (ΔR^2 = .063, p < .1546, predictors = 7), and self-efficacy (ΔR^2 = .022, p < .1546, predictors = 7) are the significant predictors.

Regressing trainees' gain in declarative knowledge against the related factors, apart from the finding that self-efficacy (ΔR^2 = .058, p < .1745, predictors = 9) has significant contribution, trainees' perceived job support is also observed to be a significant predictor (ΔR^2 = .029, p < .1745, predictors = 9). Even with compromised analysis, the training reactions measures are still found to be insignificant in terms of contribution to the variance in trainees' gain in declarative knowledge. For trainees' gain in application-based knowledge, job involvement (ΔR^2 = .058, p < .1745, predictors = 9) and self-efficacy (ΔR^2 = .025, p < .1745, predictors = 9) are found to be significant predictors.

Compromised analysis revealed that trainees' attitudes and perception of support made insignificant contribution to the variance in training transfer. However, trainees' gain in application-based knowledge contributed – although little – significantly to the variance in training transfer (ΔR^2 = .026, p < .1546, predictors = 7). This appears to be consistent with the results in correlation analysis. None of the factors in consideration appeared to have significant Pearson's correlation with training transfer. However, the Spearman's ρ value between trainees' gain in application-based knowledge and training transfer is found to be significant (ρ = .222, p < .05). This indicates the possibility of having a large number of outriders in the relationship.

By applying compromised analysis, it is found that:
- Trainees' expectancy, self-efficacy, and perceived organizational support have significant effect on their affective reactions;
- Trainees' expectancy, job involvement, and self-efficacy have significant effect on their utility reactions;
- Trainees' self-efficacy and perceived job support have significant effect on their gain in declarative knowledge;

- Trainees' job involvement and self-efficacy have significant effect on their gain in application-based knowledge; and
- Trainees' gain in application-based knowledge has significant effect on the level of their training transfer.

These findings are illustrated in Figure 3.
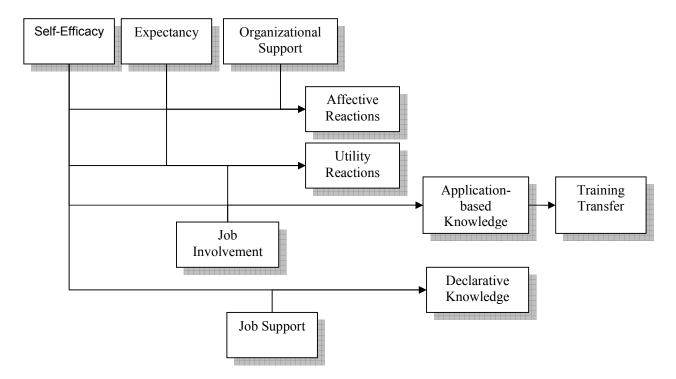
Figure 3: Model by Compromised Analysis

The Compromised Model revealed some interesting findings. Whereas trainees' self-efficacy is only found to contribute significantly to their gain in declarative knowledge in the Post Hoc Model, it is found to have significant effect on all measures of training reactions and learning. As determined in the Post Hoc analysis, trainees' expectancy is found to have significant contribution to training reactions measures, and their job involvement level affects both utility reactions and gain in application-based knowledge.

The effects of trainees' perception of support on training outcomes are found to be insignificant in Post Hoc analysis. By compromised analysis, it is found that trainees' perception of organizational support has significant effect on affective reactions, and their perception of job support contributed to their gain in declarative knowledge. There is no significant effect found for training transfer by Post Hoc analysis. In the Compromised Model, however, it is found that trainees' application-based knowledge contributed significantly to their training transfer.

DISCUSSION

The items to measure training-related expectancy in this study focused on intrinsic incentives that may have resulted from training experiences – such as having more confidence, improved work effectiveness, respect from peers, and so on – suggested to have stronger effect on trainees' motivation than extrinsic incentives (Facteau et al, 1995; Lawler & Suttle, 1973). The results of this study appeared to have confirmed such notion, as expectancy measured on this basis has been found to have significant effect on – at least – the training reactions measures. It contributed to 25% of the variance in affective reactions and 14% to the variance in utility reactions. This indicates that the strength of trainees' expectation of certain desirable outcomes from the training course may positively enhance their possible reactions towards the training course. Managers, employers, or trainers should consider conducting pre-training briefing exercises to help trainees' prepare mentally for training experiences, so that their training-related expectancy can be strengthened and thus more likely to yield positive reactions to the training.

Job involvement has been found to have moderately significant effects on trainees' utility reactions (6.3%) and gain in application-based knowledge (5.8%). It is reasonable to see that trainees' who are more involved in their

job are more likely to see relevance in the course contents with their work. It is interesting to note, however, that trainees' job involvement is actually negatively correlated with their gain in application-based knowledge (Table 2) ($r = -.241$, p < .05). Trainees' ego involvement in their job seemed to have impeded the extent of their application of the newly acquired knowledge and skills in work situations conceptually. Trainees who are more involved in their job knows their work well, and are likely to have developed habits, ideas, and opinions about how to handle certain work situations as a result of their work experience. These may hinder them from changing their mindset to apply newly acquired knowledge and skills in the work situations described in the pretest and posttest. Thus, it may be necessary for managers, employers, or trainers, to take steps help the trainees to apply the newly acquired knowledge and skills - provide more practical examples, develop action plans together with the trainees, and so on.

Self-efficacy is observed to be a significant predictor for trainees' gain in declarative knowledge in the Post Hoc Model (Figure 2). In the Compromised Model (Figure 3), it is found that trainees' self-efficacy also significantly affect training reactions and gain in application-based knowledge. In terms of learning, it appeared to have positive effects on trainees' gain in declarative and application-based knowledge (5.8%, $r = .241$ and 2.5%, $r = .096$). On the other hand, self-efficacy has negative correlation with training reactions measures, contributing 2.1% to the variance in affective reactions ($r = -.110$) and 2.2% to the variance in utility reactions ($r = -.009$). Trainees' confidence of their competence appeared to have enhanced their learning in a training experience. However, there seemed to be a tendency for trainees with high level of self-efficacy to develop slightly negative feelings towards the training course, perhaps due to the fact that the 5S training course covered rather basic contents and so presents less challenge and appeal to them.

Trainees' perception of support is found to be insignificant in its effect to training outcomes in Post Hoc analysis. However, by the Compromised analysis, the effects of trainees' perception of organizational support and job support are found to be significant. Trainees' perceived organizational support is found to have moderately positive contribution to their affective reactions (2%, $r = .093$); and their perceived job support has positive effect on their gain in declarative knowledge (2.9%, $r = .067$). The trainees' perception about how seriously the organization takes care of their well being may affect their affective reactions to training, and their perception of whether they are being supported well at their job would affect their conceptual learning. It seemed that if trainees are positive that their organization genuinely care about their well being, they would be more likely to develop positive feelings about training experiences, perhaps accepting these as a part of how the organization contribute to their development. They would also be more successful in learning the facts and concepts covered in the training – perhaps more willing to exert efforts and initiatives to learn – if they are positive that they are being adequately supported at work.

Contrary to what was hypothesized in H3, H4, and H5, there is insufficient evidence of significant effect of
- trainees' attitudes and perception of support on the level of their training transfer;
- trainees' reactions to training on their learning; and
- trainees' reactions to training on the level of their training transfer

In both Post Hoc and Compromised analysis. However, in the Compromised Model, it is found that trainees' gain in application-based knowledge has moderate significant contribution to the level of their training transfer (2.6%). This indicates a possible link between trainees' ability to apply acquired knowledge in work situations conceptually and their eventual success or failure in applying the knowledge at work. It is more likely for trainees who are more successful in applying conceptual knowledge in simulated work situations to be able to apply the related knowledge at work. Therefore, managers, employers, or trainers should consider having simulated activities – such as case studies, role-play, hands-on exercise – in training programs so that trainees can apply what they have learned in near-real situations. This would enhance the possibility of transferring the learned skills to the actual work situations.

Despite of efforts to reduce possibility of multicollinearity, significant correlations between the independent variables are still observed. Trainees' organizational commitment is found to have significantly high correlations with expectancy ($r = .578$), job support ($r = .373$), and supervisory support ($r = .498$). Trainees' perception of supervisory support has significantly positive correlations with expectancy ($r = .498$), organizational commitment ($r = .461$), job support ($r = .546$), and job involvement ($r = .277$). The lowest tolerance index for collinearity diagnosis for multiple regression analysis involving all independent variables is registered as .435. Although still acceptable, the fact that possible problem of multicollinearity should be noted nonetheless. Perhaps the number of independent variables to be considered should be reduced in future researches.

It is also noted that significant Pearson's correlation between training transfer and the other variables is not found, but its correlation with trainees' gain in application-based knowledge is found to be significant when considering Spearman's rho. This may be an indication of the presence of large number of outriders in the relationships. Perhaps if the sample size is larger, the tendency and effect of outriders may be reduced.

CONCLUSION

In this study, trainees' attitudes and perception of support is hypothesized to have significant effects on training reactions, learning, and training transfer (H1, H2, H3). It is also hypothesized that training reactions would affect learning and training transfer (H4, H5), and that learning would affect training transfer (H6). The results of the study revealed that

- trainees' self-efficacy have significant effects on training reactions and learning;
- trainees' expectancy has significant effect of training reactions;
- trainees' job involvement has significant effect on utility reactions and gain in application-based knowledge;
- trainees' perceived organizational support has significant effect on affective reactions;
- trainees' perceived job support has significant effect on gain in declarative knowledge; and
- trainees' gain in application-based knowledge has significant effect on their training transfer.

Contrary to H4 and H5, no significant effect on learning is observed from training reactions on learning and training transfer. Also, no significant effect is found from trainees' attitudes and perception of support on training transfer (H3).

REFERENCES

Alliger, G. M. & Janak, E. A. (1989). Kirkpatrick's levels of training criteria: Thirty years later. *Personnel Psychology*, *42* (2), 331-342.

Alliger, G. M., Tannenbaum, S. I., Bennett, W. Jr., Traver, H., & Shotland, A. (1997). A meta-analysis of the relations among training criteria. *Personnel Psychology*, *50* (2), 341-358.

Arvey, R. D. (1972). Task performance as a function of perceived effort-performance and performance-reward contingencies. *Organizational Behavior and Human Performance*, *8*, 423-433.

Baldwin, T. T. & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, *41* (1), 63-105.

Baumgartel, H. J., Reynolds, M. J. I., & Pathan, R. .Z. (1984). How personality and organizational climate variables moderate the effectiveness of management development programmes: A review and some recent research findings. *Management and Labour Studies*, *9* (1), 1-16.

Broad, M. L. & Newstrom, J. W. (1992). *Transfer of training*. Massachussetts: Addison-Wesley Publishing Company, Inc.

Campbell, J. P. (1988). Training design for performance improvement. In Campbell, J.P.; Campbell, R.J.; and Associates (Eds.). *Productivity in organizations*. San Francisco: Jossey-Bass. P.177-216.

Cheng, E. W. L. & Ho, D. C. K. (2001a). A review of transfer of training studies in the past decade. *Personnel Review*, *30* (1), 102-118.

Cheng, E. W. L. & Ho, D. C. K. (2001b). The influence of job and career attitudes on learning motivation and transfer. *Career Development International*, *6* (1), 20-28.

DeSimone, R. L. & Harris, D. M. (1998). *Human resource development*. 2nd Edition. Fort Worth, TX: Harcourt College Publishers.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, *71*, 500-507.

Elangovan, A. R. & Karakowsky, L. (1999). The role of trainee and environmental factors in transfer of training: An exploratory framework. *Leadership and Organization Development Journal*, *20* (5), 268-276.

Erdfelder, E., Faul, F., & Buchner, A. (1996). G*Power: A general power analysis program. *Behavior Research Methods, Instruments, & Computers, 28*, 1-11.

Facteau, J. D., Dobbins, G. H., Russel, J. E. A., Ladd, R. T., & Kudisch, J. D. (1995). The influence of general perceptions of the training environment on pretraining motivation and perceived training transfer. *Journal of Management*, *21* (1), 1-25.

Ford, J.K., Quinones, M.A., Sego, D.J., & Sorra, J.S. (1992). Factors affecting opportunity to perform trained tasks on the job. *Personnel Psychology*, *45*, 511-527.

Ford, J. K. & Weissbein, D. A. (1997). Transfer of training: An updated review and analysis. *Performance Improvement Quarterly*, *10* (2), 22-41.

Foxon, M. (1993). A process approach to the transfer of training, part 1: The impact of motivation and supervisory support on transfer maintenance. *Australian Journal of Educational Technology*, *9* (2), 130-143.

Foxon, M. (1997). The influence of motivation to transfer, action planning, and manager support on the transfer process. *Performance Improvement Quarterly*, *10* (2), 42-63.

Georgenson, D. L. (1982). The problem of transfer calls for partnership. *Training and Development Journal*, *36* (10), 75-78.

Gist, M. E. & Stevens, C. K. (1998). Effects of practice conditions and supplementary training method on cognitive learning and interpersonal skill generation. *Organizational Behavior and Human Decision Processes*, *75* (2), 142-169.

Gist, M. E., Stevens, C. K., & Bavetta, A. G. (1991). Effects on self-efficacy and posttraining intervention on the acquisition and maintenance of complex interpersonal skills. *Personnel Psychology*, *44*, 837-861.

Hackman, J. R. & Porter, L. W. (1968). Expectancy theory predictions of work effectiveness. *Organizational Behavior and Human Performance*, *3*, 417-426.

Hirano, H. (1995). *5 pillars of the visual workplace: The sourcebook for 5S implementation* (Talbot, B. Trans.). Portland, Oregon: Productivity Press. (Original work published as *5S shido manyuaru* by Nikkan Kogyo Shimbun, Ltd., Tokyo, Japan, 1990).

Kirkpatrick, D. L. (1967). Evaluation. In R.L. Craig and L.R. Bittel (Eds.), *Training and development handbook* (87-112). New York: McGraw-Hill.

Kirkpatrick, D. L. (1987). Evaluation. In R.L. Craig (Ed.) *Training and development handbook* (3rd ed.) (301-319). New York: McGraw-Hill.

Kirkpatrick, D.L. (1994). *Evaluating training programs: The four levels*. San Francisco: Berrett-Koehler Publishers.

Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology*, *78* (2), 311-328.

Lawler, E. E. III & Suttle, J. L. (1973). Expectancy theory and job behavior. *Organizational Bahavior and Human Performance*, *9*, 482-503.

Lodahl, T. & Kejner, M. (1965). The definition and measurement of job involvement. *Journal of Applied Psychology*, *49* (1), 24-33.

Malaysian Institute of Management (1996). *Malaysia business trends survey report 1996*. Kuala Lumpur: Malaysian Institute of Management.

Mathieu, J. E., Martineau, J. W., & Tannenbaum, S. I. (1993). Individual and situational influences on the development of self-efficacy: Implications for training effectiveness. *Personnel Psychology*, *46*, 125-147.

Mathieu, J. E., Tannenbaum, S. I., & Salas, E. (1992). Influences of individual and situational characteristics on measures of training effectiveness. *Academy of Management Journal*, *35* (4), 828-847.

Marx, R. D. (1986). Self-management skill retention. *Training and Development Journal*, *40* (1), 54-57.

Noe, R. A. (1986). Trainees' attributes and attitudes: Neglected influences on training effectiveness. *Academy of Management Review*, *11* (4), 736-749.

Noe, R. A. & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology*, *39*, 497-523.

Orpen, C. (1999). The impact of self-efficacy on the effectiveness of employee training. *Journal of Workplace Learning: Employee Counseling Today*, *11* (4), 119-122.

Peters, L. H. & O'Connor, E. J. (1980). Situational constraints and work outcomes: The influences of a frequently overlooked construct. *Academy of Management Journal*, *5* (3), 391-397.

Pritchard, R. D. & Sanders, M. S. (1972). The influence of valence, instrumentality, and expectancy on effort and performance. *Journal of Applied Psychology*, *57* (1), 55-60.

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports*, *51*, 663-671.

Tracey, J.B., Hinkin, T.R., Tannenbaum, S.I., & Mathieu, J. E. (2001). The influence of individual characteristics and the work environment on varying levels of training outcomes. *Human Resource Development Quarterly*, *12* (1), 5-23.

Van der Klink, M. R. & Streumer, J. N. (2002). Effectiveness of on-the-job training. *Journal of European Industrial Training*, *26*, 196-199.

Vroom, V. H. (1964). *Work and motivation*. New York: Wiley.

Wexley, K. N. & Baldwin, T.T. (1986). Posttraining strategies for facilitating positive transfer: An empirical exploration. *Academy of Management Journal*, *29* (3), 503-520.

Wong, P. L. (2000). *Malaysia business trends survey report 2000*. Kuala Lumpur: Malaysian Institute of Management.

Demand Analysis of FAFH in Malaysia

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ABSTRACT
Despites the importance of FAFH, limited attempt has been made to study the economics of this emerging cultural change. This may be due to underestimation of importance of FAFH, especially when the food sector is mostly studied at aggregate level. The general objective of this study is to analyze FAFH consumption in Malaysia. Specifically, the objective of this research is to analyze the determinants of FAFH demand and examine how socioeconomic factors of consumers have contributed to FAFH. The control variables for the study provided expected coefficients that are significantly different than zero. As the level of development increase, household structure changes simultaneously with income increase that lead to an increase in FAFH expenditure. This study has shown that FAFH has the propensity to increase with an increase in income. FAFH high-income elasticity provides a good indicator for FAFH industry demand.

INTRODUCTION

Food consumption patterns have changed over time as a result of development. Coupled with an increase in income and urbanization, total expenditure on food away from home 'FAFH' has increased rapidly. The rising FAFH demand has stimulated the development of other economic activities especially in the service sector such as franchising, packaging and catering. In line with this development it is inherently important to understand the demand of FAFH.

Despites the importance of FAFH, limited attempt has been made to study the economics of this emerging cultural change. This may be due to underestimation of importance of FAFH, especially when the food sector is mostly studied at aggregate level. The general objective of this study is to analyze FAFH consumption in Malaysia. Specifically, the objective of this research is to analyze the determinants of FAFH demand and examine how socioeconomic factors of consumers have contributed to FAFH. To meet these objectives the paper is organized as following. The next two sections describe the data and sketch a picture of FAFH consumption behavior followed by empirical approach and discussion of the results.

Consumer Expenditure on Food in Malaysia

Changes in lifestyle and demographic affect consumer demand for goods and services. Traditionally, Malaysian households' consists of married couples with a working husband, non-working wife and their children. On the other hand the non-traditional household comprising of working wife households, single parent household and household of multiple adult without live at home child are increasing. An average Malaysians would normally have four daily meals. Not surprising, the largest chunk of expenditure was accounted for by food and drink with a combined expenditure of M$32,971 million in 2000.

The traditional household would have their meals at home and the non-traditional one would have it away from home. In light of the changing structure of the households, the growth in ready meals and pre-packaged foods has pushed up spending on food. Thus families are eating out more either at fast-food restaurants as well as traditional restaurants. Studies shows that change in consumer demand have impacted the structure of the food industry (Goodwin and Brester, 1995; Senauer *et al.*, 1991).

Changing lifestyle resulting in increasing popularity of eating out amongst Malaysians with an evident increase in dining in fine restaurants as well as in cheaper food stalls popularly known as hawkers "*gerai.*" The majority of non traditional household Malaysians consume their breakfast, lunch and dinner at   food stalls, which are often more cost effective than preparing their meals.

There are many factors that may be considered in this study to determine demand for FAFH in Malaysia. Any economic text infers that income is a very important determinant of demand. The income structure of Malaysian is also associated with the various races where the Chinese ethnic is associated with high income. In addition, the Chinese family likes to dine out. Chinese in Malaysia are normally associated with family business activities that require them time to be spent on business rather than home. Therefore demand for FAFH for Chinese would be higher. FAFH is also connected with the level of development where income is high in more developed region. The level of development in Malaysia differs from one State to another. The Peninsular Malaysia is more developed than Sarawak and Sabah. Thus most of the European and American food chains are concentrated at major cities in the Peninsular. European and American foods are popular, through restaurant chains such as Kentucky Fried Chicken, McDonald's and Shakey's Pizza. Analyzing the income elasticity of demand of FAFH is important in understanding future size of the service industry.

FAFH is also popular among students and office workers (white collar profession). These stalls normally charge lower price as they cater to customers with lower income. These are traditionally roadside stalls though now typically gather together in formal areas or even modern style food courts. Most sell traditional Malaysian dishes for low prices.

METHODOLOGY

To test hypotheses how FAFH demand is affected by socioeconomic factors, a data set on information of household namely the Household Expenditure Survey, 1999 was used. The demand model is constructed using (Becker, 1965).[1] The dependent variable constitutes the value in (RM) spent by the household and the independent variables constitute dummy variables representing education, profession, gender, household head status, races, ages and location,

The Becker's New Household Economics Model s an extension of the demand theory, which deem prices, income, demographics, and time constraints affecting households purchases of items. The salient feature of this model is the inclusion of opportunity cost as an important factor in allocating expenditure of FAFH. In this study the opportunity cost is time spend in term of preparing the food including purchasing the ingredients, and cleaning after meal which determine the household decision as whether to choose eating away from home The demand for FAFH can be estimated by:

$$F_{ih} = F(Z_{ih}, Y_{ih}, Z_{ih}),$$

where F_{ih} is the expenditure on FAFH on the ith individual and hth household,
   Y_h is the hth household's income,
   and Z is a vector of variables including all other control variables

Descriptive statistics for the variables that are used in the modeling of FAFH in Malaysia are summarized in Table 2.

Not all respondents in this study reported FAFH expenditure during the sample study period. Only 96.1 percent of the respondents reported their FAFH expenditures during the survey period, while 3.9 percent of the sample reported that they had made zero expenditures on FAFH. Without taking the zero expenditure sample into consideration would lead to statistical bias. Thus in overcoming this problem, Tobit modeling framework utilizing censored dependent variable is applied.

Using the work Deaton and Irish (1984) and by assuming a linear equation, Tobit formulates   both   latent demand and observed demand as: -

$$Y^* = \beta'X + \varepsilon, \text{ (latent demand)}$$
$$Y^{**} = \max(Y^*, 0) \text{ (observed demand)}.$$

The log likelihood function is being used in Tobit model and is expressed as: -

$$L(\beta,\sigma) = \prod_0 \Phi(1 - \beta'X/\sigma) \prod_+ \varphi[(Y - \beta'X)/\sigma]/\sigma$$

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[1] This method is also being employed by Ma Hengyun et. al. (2002)

where   Φ the cumulative probability distribution function
ϕ Is the density function of a standard normal random variables, and
σ is the standard deviation of ω.

The subscripts 0 and + mean that summation is performed over the sub-sample in which dependent variable is zero and positive.

Like McCracken and Brandt (1987), the unconditional and conditional expected value of the dependent variable, Y_i, in the Tobit analysis can be written as:

$$E(Y_i \mid X_i) = F\left(\frac{\beta' X_i}{\sigma}\right)(\beta' X_i) + \sigma f\left(\frac{\beta' X_i}{\sigma}\right) \text{ and}$$

$$E(Y_i^* \mid X_i) = E(Y_i \mid X_i, Y_i) > 0) = (\beta \beta X_i) + \sigma f\left(\frac{\beta' X_i}{\sigma}\right) / F\left(\frac{\beta' X_i}{\sigma}\right)$$

where   F (.) is cumulative normal distribution function.
f(.) is the standard normal density, respectively.

Hence, total elasticity of expected value, Y_i, for the kth variable can be decomposed as:

$$E_i = \frac{\partial F\left(\frac{\beta' X_i}{\sigma}\right)}{\partial X_i} \frac{X_i}{F\left(\frac{\beta' X_i}{\sigma}\right)} + \frac{\partial F(Y_i^* \mid X_i)}{\partial X_i} \frac{X_i}{E(Y_i^* \mid X_i)}$$

The first part of the equation representing elasticity of the probability of consumption and the second part is the elasticity of expected consumption of presently consuming individuals.

RESULT AND DISCUSSION

Table 3 depicts the determinants of FAFH consumption, where the R-square of an OLS   (excluding zero value observation) is 0.29, which is an acceptable level. The control variables also provide expected coefficients that are significantly different than zero. Male gender, age of head household groups (less than 20 year, 21-35 year, and 36-50 year) and education level of household (SRP, SPM, STPM/Diploma and Degree level) show that these groups of individuals spend more on meals away from home than others. FAFH demand is higher among Chinese compared to Malay and Indian, professional and white collar workers relative to blue-collar workers. This may be due to blue-collar workers consumer pack lunches from home.

Level of development is positively related to the increase in demand of FAFH. Thus not surprisingly this study shows that the FAFH demand is higher in Peninsular Malaysia compared to Sabah and Sarawak.   In addition FAFH demand is also higher at urban areas compared to rural areas.   In sum, well off, and urban area individuals are the consumer group that is the one most likely to be eating out than rural area. The result also shows that negative and significant signs on the coefficients of number of household members less than 12 years old, which indicate that children consume less away from home compared to adult.

The result also suggests significant relationship between income levels and demand for FAFH. The coefficient of the household income variable in the total expenditure equation is positive and highly significant.

Rise in demand of FAFH has been driven by rising incomes (Table 4) the income elasticity shows that on average, for each 1 percent rise in income, expenditure on FAFH rose by 0.753 percent. However, income elasticity increased with respect to increase in income, suggesting that FAFH demand is higher among the wealthier (1.747) compared to lower level income (0.469 for income per capita less RM1000).   The disaggregating of the total elasticity suggests that it is the enlargement of market participation that is contributing the increasing FAFH demand (about 0.452 of 0.753).

Age structure also influences income elasticity of FAFH. As shown in Table 4 income elasticity increased from lower to middle age groups and declined at the older age group (more than 50 years old). This in line with the declining of income and activities as the retirement age for Malaysian is 55. Thus middle age consumers are the consumer group that is more likely to be eating out due to the rapid rise in their income.

CONCLUSION

In this paper, we have shown the determinants of demand for FAFH. We have shown the socio economic factors that determine demand for FAFH. As the level of development increase, household structure changes simultaneously with income increase that lead to an increase in FAFH expenditure. This study has shown that FAFH has the propensity to increase with an increase in income.

FAFH high-income elasticity provides a good indicator for FAFH industry demand. FAFH industry can expect high growth as Malaysia is set to become a developed nation by 2020. Consumers would have less time to prepare their food; instead they will opt to eat away from home.

REFERENCES

Becker, G. S. "A theory of allocation of time." *Economics Journal.* 75(1965): 493-508.

Deaton, Angus and Margaret Irish. "Statistical Model for Zero Expenditure in Household Budgets." *Journal of Public Economics*, 23,1-2(1984): 59-80.

Huang, Jikun and Cristina C. David. "Demand for Cereal Grains in Asia: the Effect of Urbanization." *Agricultural Economics.* 8(1993): 107-124.

Jensen, Helen H. and Steven Yen T. "Food Expenditures Away from Home by Type of Meal." *Canadian Journal of Agricultural Economics*. 44,1 (March 1996): 67-80.

Kimhi, Aval. "Double-Hurdle and Purchase-Infrequency Demand Analysis: A Feasible Integrated Approach." *European Review of Agricultural Economics*. 26, 4 (1999):425-442.

Ma, Hengyun, Jikun Huang, and Scott Rozelle (2002), "Reassessing China's Livestock Statistics-An Analysis of Discrepancies and the Creation of New Data Series", Working Paper. Center for Chinese Agricultural Policy, Chinese Academy of Sciences and Department of Agricultural and Resource Economics, University of California Davis. April 2002.

Ma, Hengyun, Jikun Huang, and Scott Rozelle and Fuller, F (2002), Getting Rich and Eating Out: Consumption of Food Away from Home in Urban China, Working Paper 02-E11, Center for China Agricultural Policy,

Macdonald, John F., and Robert A. Moffitt. "The Uses of Tobit Analysis." Rev. Econ. and Statist. 62(1980):318-321.

Manrique, J. and Jensen, H. H. "Working Women and Expenditures on Food Away-from-Home and At-Home in Spain." *Journal of Agricultural Economics* 49,3 (Sep. 1998):321-33.

McCracken, V. A. and J. A. Brandt. "Household consumption of food–away-from-home: total expenditure and by type of food facility." *American Journal of Agricultural Economics.*" 69(May 1987):318-321.

Mihalopoulos, Vasilis G. and Michael P. Demoussis. "Greek household consumption of food away from home: microeconometric approach." *European Review of Agricultural Economics.* 28, 4 (2001):421-432.

Nayga, R., and O. Capps, Jr. "Determinants of food away from home consumption: update." *Agribusiness.* 8(Nov. 1992):549-559.

Newman, Carol, Maeve Henchion and Alan Matthews. "Infrequency of Purchase and Double Hurdle Model of Irish Household Meat Expenditure." *European Review of Agricultural Economics*. 28, 4 (2001):393-412.

Prochaska, Fred J. and R. A. Schrimper. "Opportunity cost of time and other socioeconomic effects on away from home food consumption." *American Journal of Agricultural Economics.* 55(Nov. 1973):595-603.

Tobin, J. "Estimation of relationship for limited dependent variables." *Econometrica.* 26(Jan. 1958):24-36.

Table 1: Consumer Expenditure on Food by Broad Sector 1997-2001

	1997	*1998*	*1999*	*2000*	*2001*	*1997/2001 % change*
RM million						
Meat	4,362.00	3,771.50	4,056.00	4,484.20	4,390.00	0.6
Fish	5,398.00	4,882.00	5,268.00	5,972.10	5,983.90	10.9
Milk, cheese and eggs	2,555.20	2,249.70	2,489.00	2,841.10	2,857.00	11.8
Fruit	3,022.00	2,806.00	3,145.00	3,651.10	3,767.60	24.7
Vegetables	2,917.50	3,071.00	3,325.00	3,822.60	4,036.30	38.3
TOTAL	28,068.00	26,616.00	28,678.00	32,970.60	33,728.60	20.17
% analysis						
Meat	15.54	14.17	14.14	13.6	13.02	-16.25
Fish	19.23	18.34	18.37	18.11	17.74	-7.75
Milk, cheese and eggs	9.1	8.45	8.68	8.62	8.47	-6.95
Fruit	10.77	10.54	10.97	11.07	11.17	3.75
Vegetables	10.39	11.54	11.59	11.59	11.97	15.13
TOTAL	100	100	100	100	100	

Source: Euromonitor estimates based on trade sources and industry publications

Table 2: Descriptive Sample Statistics

	Non Consuming Household N=347		Consuming Household N=8576		Fulll Sample N=8926	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Income	1030.72	787.98	2711.57	3111.66	2646.23	3071.75
FAFH	0.00	0.00	183.33	256.32	176.21	253.78
Member less than 12 year	1.22	1.55	1.31	1.45	1.30	1.45
Member 17-21 years	0.56	0.91	0.74	1.05	0.73	1.05
Member above 21 years	0.44	0.79	0.58	1.01	0.57	1.01
Head household gender	0.72	0.45	0.85	0.36	0.84	0.36
Age less than 20 year	0.01	0.11	0.01	0.09	0.01	0.09
Age 21-35 year	0.25	0.43	0.27	0.44	0.27	0.44
Age 36-50 year	0.29	0.46	0.41	0.49	0.41	0.49
Age above 50 year	0.45	0.50	0.31	0.46	0.32	0.47
Malay	0.39	0.49	0.50	0.50	0.50	0.50
Cina	0.13	0.33	0.29	0.46	0.29	0.45
India	0.07	0.26	0.07	0.26	0.07	0.26
Other race	0.41	0.49	0.13	0.34	0.14	0.35
Professional workers	0.04	0.19	0.15	0.35	0.14	0.35
White collar	0.01	0.08	0.07	0.25	0.07	0.25
Blue collar	0.61	0.49	0.52	0.50	0.53	0.50
Other job	0.34	0.48	0.26	0.44	0.26	0.44
SRP	0.07	0.25	0.12	0.32	0.11	0.32
SPM	0.05	0.23	0.22	0.42	0.22	0.41
STPM/Diploma	0.02	0.14	0.08	0.26	0.07	0.26
Degree level	0.00	0.05	0.05	0.21	0.04	0.21
Other education	0.85	0.35	0.54	0.50	0.55	0.50
Peninsular Malaysia	0.60	0.49	0.82	0.39	0.81	0.39
Sabah	0.22	0.41	0.09	0.28	0.09	0.29
Sarawak	0.18	0.39	0.10	0.29	0.10	0.30

Table 3: Maximum Likelihood Estimate of Tobit Model for Expenditure for Food Away From Home

Variable	Normalized Coefficient	T-Ratio
Income	0.00013	32.2380*
Gender (Male)	0.20408	6.5801*
Member less than 12 year	-0.06095	-7.5953*
Member 17-21 years	0.02270	2.0643*
Member above 21 years	0.12614	10.6900*
Age less than 20 year	0.49696	4.0797*
Age 21-35 year	0.23982	6.9247*
Age 36-50 year	0.15509	5.1171*
SRP	0.08756	2.3976*
SPM	0.15365	4.7251*
STPM/Diploma	0.18484	3.7561*
Degree level	0.28682	4.4038*
Peninsular Malaysia	0.36836	10.5880*
Urban area	0.18004	7.7236*
Malay	-0.16290	-3.8808*
Cina	0.46772	11.1050*
India	-0.10102	-1.7849**
Professional workers	0.04866	1.1412
White collar	0.10895	2.2096*
Blue collar	-0.01657	-0.5842
CONSTANT	-0.40723	-8.3049*
Log-L	-58630;967	
Standard error[a]	217.73	

Note:
* Significant at 1% level
** Significant at 10% level
[a] Standard error estimate of the dependent variable and is simultameously estimated with the regression coefficients.

Table 4: Elasticity of household income for expenditure on FAFH in Malaysia

	Probability Elasticity	Conditional Elasticity	Total Elasticity
All sample	**0.452**	**0.300**	**0.753**
Income Groups			
Less than RM1000.00	0.421	0.048	0.469
RM1000.00 – RM2000.00	0.387	0.150	0.536
RM2000.00 – RM3000.00	0.388	0.290	0.678
RM3000.00 – RM4000.00	0.422	0.437	0.859
RM4000.00 – RM5000.00	0.453	0.583	1.036
More than RM5000.00	0.577	1.170	1.747
Stratum			
Urban	0.420	0.388	0.809
Rural	0.536	0.184	0.720
Job			
Profrssional	0.524	0.656	1.179
White collar	0.421	0.349	0.770
Blue collar	0.437	0.209	0.646
Other	0.424	0.296	0.719
Age class			
Less than 25 year	0.250	0.219	0.468
26 – 35 year	0.440	0.306	0.746
36 – 45 year	0.498	0.354	0.852
45 – 55 year	0.469	0.306	0.776
More than 56 year	0.450	0.242	0.692

Fiscal Sustainability in Three Crisis Affected ASEAN Countries

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ABSTRACT

Following the literature, fiscal sustainability criterion is usually adopted to evaluate whether or not fiscal policy is under control. The fiscal policy is sustainable if the government intertemporal budget constraint (GIBC) holds in the present value terms. Conversely, if the budget is out of control, economic polices at both macro and microeconomic levels will quickly become unsupportable and require changes to be made. The main purpose of this paper is to assess empirically the issue of long run fiscal sustainability imbalances in three ASEAN crisis-affected countries (Malaysia, the Philippines and Thailand). The sampling period are divided into two sub-periods of pre (1975:1-1997:2) and post crisis (1975:1-2003:2). The statistical computations indicate that the fiscal stance in Thailand is on sustainable path while Malaysia and the Philippines are seeking for one in the full sampling period. From the policy perspectives, the needs for fiscal consolidation and prudent fiscal policies is essential in these countries for reducing public debt, improving operation of monetary and exchange rate policies, facilitating private sector-led growth in promoting sustainable economic performance. This acts as one of the important ingredients for the ASEAN region to band together towards the economic and monetary cooperation.

INTRODUCTION

The resurgence of interest on the sustainability of the fiscal deficit has arise from two important developments in the global economy: (1) the large fiscal imbalances witnessed in many of Western Europe and the Unites States over the past two decades; and (2) the fiscal discipline demanded from the European Union (EU) member countries for European Monetary Union (EMU) membership by the end of the 1999. They required that the governments runs a budget deficit of no more than 3 percent of national income and that the amount of government borrowing should not 60 percent of national income measured as real GDP. In addition, International organization like the World Bank and the International Monetary Fund (IMF) had developed and regulated wide-ranging plan in assessing and monitoring fiscal sustainability among their member countries (Chalk and Hemming, 2000 and Edwards, 2002).

In principle, an economy will be able to sustain fiscal deficit as long as it can raise the necessary funds by borrowing. Although such a policy is feasible in the short run, the ability of the economy to service its debt by resorting to further borrowing in the long run is likely to be questioned once the deficit become persistent. In this sense, sustainable fiscal policies are those that can be continued indefinitely without any modification. In other words, the fiscal policy is sustainable if the government intertemporal budget constraint (GIBC) holds in the present value terms. Conversely, if the budget is out of control, economic polices at both macro and microeconomic levels will quickly become unsupportable and require changes to be made. If such phenomenon does occur, then the budget imbalances would imply a need for larger and more painful macroeconomic adjustments for the economy. Given the detrimental impact of persistent deficit finance practices on debt accumulation, inflation rates, interest rates and economic growth, evaluating and monitoring the sustainability fiscal policies in the long run is an extremely important task to answer.

There has been a substantial volume of empirical studies focusing on the sustainability of government's fiscal financial strategy. In this context, two different empirical approaches have been used to analyze the sustainability of fiscal polices. The first approach was initiated by Hamilton and Falvin (1986) and was further empirically tested in Kremers (1988), Trehan and Walsh (1988), Wilcox (1989), Smith and Zin (1991), MacDonald (1992), Makrydakis *et al.* (1999), Feve and Henin (2000), Olekalns (2000) and Uctum and Wickens (2000). This line of research tests the univariate stationarity of the debt and/ or deficit. The second approach originated by Hakkio and Rush (1991) in examining the bivariate long run cointegration relationship between government revenue and expenditure (see also empirical evidence by Tanner and Liu, 1994; Liu and Tanner, 1995; Quintos, 1995; Payne, 1997; Papadopoulos and Sidiropoulos, 1999; Martin, 2000; Hatemi-J, 2002). Most of these studies focus on the US and the Western European countries. Only recently, empirical investigations on intertemporal fiscal solvency constraint on the Asian region and the transition economy (eg. Eastern Europe) have becoming increasing available in the literature (see for example, Wu, 1998; Green *et al.*, 2001; Chung, 2002; Cashin *et al.*, 2003).

Following this development, the main purpose of this paper is to provide an in-depth analysis and draw some policy lessons empirically on the issue of long run sustainability of fiscal imbalances in three crisis-affected ASEAN countries namely, Malaysia, the Philippines, and Thailand. These groups of countries lapsed into severe financial crises in 1997. Looking back on the historical data, these countries running imbalances of fiscal position in some of the years while surplus in the other years. Interestingly, after the financial turmoil in 1997, the fiscal position of these countries swung into negative figures (4 percent of GDP). This paper also attempt to answer the question of whether the fiscal imbalances recorded in the post-crisis era are consistent with the sustainability criterion by dividing the quarterly sample period (1975:1-2003:2) into two sub-samples of pre (1975:1-1997:2) and post (1975:1-2003:2) crisis.

To research this problem, we adopted nonstationary econometric time series analysis. This includes the unit root tests and the cointegration techniques. This paper also considers the issue of potential structural break(s) with cointegration by Gregory and Hansen (1996). In order to test the necessary and sufficient condition of sustainable fiscal policy, we used the Stock and Watson (1993) dynamic OLS (DOLS) approach. For this reason, time series data on government expenditure and revenue are examined to establish whether successive government conduct of fiscal policy has been consistent with the existence of the GIBC. In addition, we provide a formal theoretical framework for analyzing the sustainability of fiscal policy based on GIBC framework.

The remainder of the paper is organized as follows. Section 2 discusses the theoretical underpinnings based on GIBC, its association to the long run fiscal policy sustainability and its testable implications. Section 3 outlines the empirical methodology for testing GIBC and a data description. Econometric evaluation of the findings are presented and discussed in Section 4. The main conclusions and policy implications are summarized in Section 5.

GOVERNMENT INTERTEMPORAL BUDGET CONSTRAINT: SUSTAINABILITY CONDITION

To investigate whether the government's intertemporal budget constraint being fulfilled in the long run, let us consider the budget constraint faces by a government at period *t* written as

$$G_t + (1+r_t)B_{t-1} = RR_t + B_t \tag{1}$$

with G_t is the value of government purchase of goods and services and transfer payments, RR_t is the government revenue, B_t is government debt and r_t is the (one period) interest rate. It is worth noting that the variables in Equation (1) can be nominal, real or "deflated" by population or real GDP[1].

The budget constraint in Equation (1) is pertains to only period *t*. Subsequently, there is similar constraint as Equation (1) for periods of *t*+1, *t*+2, *t*+3,…, *t*+n and recursively solving that equation via forward substitutions leads to the following government intertemporal budget constraint of

$$B_0 = \sum_{t=1}^{\infty} \delta_t [RR_t - G_T] + \lim_{n \to \infty} \delta_n B_n \tag{2}$$

where $\delta_t = \prod_{s=1}^{t} \beta_s$ where $\beta_s = 1/(1+i_s)$, and δ_t is the discount factor. Equation (2) shows that the current value of government debt B_0 is equal to the expected present value of all future primary surpluses $\sum_{t=1}^{\infty} \delta_t [RR_t - G_t]$, plus a limiting term that represents the asymptotic expected present value of the government's debt. The crucial element in Equation (2) is the last term *lim* $\delta_n B_n$, where the limit is taken as $n \to \infty$. When the limit term is zero $\lim_{n \to \infty} \delta_n B_n = 0$, this means that in the long run we rule out a Ponzi scheme where the government is 'bubble' financing its expenditure by issuing new debts to finance the deficits. Therefore, a fiscal policy will be sustainable if the limiting term is zero.

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[1] The interpretation of the interest rate in Equation (1) depends on how total government expenditures and revenues are measured. When the variables are nominal, r_t is the nominal interest rate; when the variables are real, r_t is the real interest rate; when the variables are real per real GDP, r_t is the real interest rate minus the rate of growth in real GDP; and when the variables are real per capita, r_t is the real interest rate minus the rate of population growth (Hakkio and Rush, 1991).

However, Equation (2) given is not an appropriate equation for the empirical testing. Following, the literature on the host subject, we assumed that the interest rate is stationary around a mean r or expressed as the real interest rate. In order to transform the equation into some testable implication and after further manipulation, Equation (2) may also be written as

$$RG_t - RR_t = \sum_{s=0}^{\infty} \frac{\Delta RR_{t+s} - \Delta RG_{t+s} + r\Delta B_{t-1+s}}{(1+r)^{s-1}} + \lim_{s \to \infty} \frac{B_{t+s}}{(1+r)^{s+1}} \tag{3}$$

where RG_t represent the total government spending on goods and services and transfer payments and interest on the debt or $RG_t = G_t + rB_{t-1}$. Following Hakkio and Rush (1991), we assume that the RR_t and $G_t + (1+r)B_{t-1}$ are nonstationary variables of $RR_t = \alpha_1 + RR_{t-1} + \varepsilon_{1t}$ and $RG_t = \alpha_2 + RG_{t-1} + \varepsilon_{2t}$. Consequently, Equation 3 can be rewritten as

$$RG_t = \alpha + RR_t + \lim_{s \to \infty} \frac{B_{t+s}}{(1+r)^{s+1}} + \varepsilon_t \tag{4}$$

where $\alpha = \frac{1+r}{r}(\alpha_1 - \alpha_2)$ and $\varepsilon_t \sum_{s=0}^{\infty} \frac{(\varepsilon_{1t} - \varepsilon_{2t})}{(1+r)^{s-1}}$.

Equation (4) forms the basis of the testable hypothesis. If the transversality[2] condition holds, the limit term in Equation (4) is zero and rewriting Equation (4) we obtained

$$RR_t = a + bRG_t + \mu_t \tag{5}$$

along with the null hypothesis of $b = 1$ and μ_t stationary process. Equation (5) has been used as the basis to assess the sustainability of government intertemporal budget constraint in the literature. Following the work of Quintos (1995) and Martin (2000), four scenarios of the sustainability conditions can be identifies as follows:

(a) The deficit is 'strongly' sustainable if and only if the *I(1)* processes of RR and RG are cointegrated with cointegrating vector [1,-1]or with $b = 1$. It means that the government budget constraint intertemporally holds and at the same time, the undiscounted debt process B_t is *I(1)*.

(b) The deficit is 'weakly' sustainable if and only if RR and RG is cointegrated with the coefficient of b expressed as $0 < b < 1$[3].

(c) The deficit is unsustainable if $b \le 0$. An unsustainable deficit is the condition which implies that the debt process of B_t is exploding at the rate equal to or in excess of the growth rate in the economy, such that the limiting term in government intertemporal budget constraint of Equation (2) is violated.

(d) The condition where $b > 1$ is not consistent with a deficit. It implies that the government revenues are growing at the faster rate than the government expenditures (Martin, 2000).

ECONOMETRIC METHODOLOGY

Unit root tests

In carrying out the cointegration analysis, the first step is to implement the unit root tests. For this purpose, we deployed the Said and Dickey (1984, ADF) and the stationary test by Kwiatkowski *et al.* (1992, KPSS). The ADF test is based on the null hypothesis that a unit root exists in the time series. In contrast, the KPSS procedure tests for level (η_μ) or trend stationarity (η_τ) against the alternative of a unit root. Briefly, the KPSS test statistic for level (trend) stationary is expressed as

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[2] The transversality condition requires a zero limit of future government debt discounted at a rate that depends on the probability distribution of future debt and not in the government bond rate. In this sense, transversality condition is to rule out Ponzi schemes. When we rule out the Ponzi schemes, the fiscal policy will be sustainable (see Equation 2 of the main text).

[3] Hakkio and Rush (1991) demonstrate that $0 < b < 1$ is a sufficient criterion for the deficit to be sustainable. However, the condition of $b < 1$ implies that the government expenditure will always be larger than revenue. In this limit, the undiscounted stock of debts will reach infinity and makes the value of debt unbounded that provides incentives for government to default on its debt. Therefore, this is the less desirable scenario.

$$\eta_\mu(\eta_\tau) = \frac{1}{s^2(k)T^2} \sum_{t=1}^{T} S_t^2 \qquad (6)$$

where $S_t = \sum_{i=1}^{t} u_i$, u_t are the residuals from the regression of X_t on a constant (a constant and trend) for the level (trend) stationarity, $s^2(k)$ is the non-parametric estimate of the 'long run variance' of u_t while k stands for the lag truncation parameter. Its combined use with ADF tests is likely to enable more clear-cut conclusion on the requirement of the order of integration when applying time series data.

Multivariate Cointegration Procedure

The determination of the number of cointegrating vectors based on Johansen and Juselius (1990, JJ) multivariate procedure depends on the use of two likelihood ratio (LR) test statistics: the trace test and the maximum eigenvalue test. The JJ procedure is the popular in the empirical testing of time series literature and the detail explanations are not presented here. Critical values for both the trace and maximum eigenvalue tests are tabulated in Osterwald-Lenum (1992).

The importance of applying a degree-of-freedom correction for the JJ procedure in small samples is well known. The correction factor is necessary to reduce the excessive tendency of the test to falsely reject the null hypothesis of no cointegration often associated with data of a relatively short span. Cheung and Lai (1993) provide the correction factor for small sample sizes of the JJ likelihood ratio tests while Reinsel and Ahn (1992) suggest an adjustment to the estimated trace and maximum eigenvalue statistics. The degree-of-freedom correction suggested by Reinsel and Ahn (1992) is to multiply the test statistic by *(T-pk)/T*, where *T* is the sample size, *p* is the number of variables, and *k* is the lag length of the VAR model. In the analysis that follows, we relied on the latter suggestion to check for the significance and the robustness of the cointegration results from the JJ procedure.

Gregory and Hansen Cointegration Method

The JJ approach has its limitations especially when dealing with a long data span may be affected by major economic events. Several studies have documented the sensitivity of the outcome of the JJ tests to structural breaks (Wu, 1998; Lau and Baharumshah, 2003)[4]. Given that such breaks are likely to exist in estimating a cointegrating relationship, we apply the Gregory and Hansen (1996, GH) cointegration tests that account for an endogenously determined break.

Briefly, the approach is similar to the Engle-Granger two-step procedure, except the dummy variables ($D_{t\tau}$) are included in the cointegrating regression to account for a shift in the long-run relationship. The advantage of this test is the ability to treat the issue of a break (which can be determined endogenously) and cointegration altogether. In their paper, Gregory and Hansen had provided a set of residual-based cointegration tests that allow for (i) level shift, (ii) level shift with trend and (iii) regime shift alongside with the asymptotic critical values for their tests.

Specifically, the models are estimated (separately) as follows, which tallies the model 2, 3 and 4 in Gregory and Hansen (1996).

Model 2: Level Shift (C)
$$RR_t = \mu_1 + \mu_2 D_{t\tau} + \delta^T RG_t + e_t \qquad t=1,...n \qquad (7)$$

Model 3: Level Shift with Trend (C/T)
$$RR_t = \mu_1 + \mu_2 D_{t\tau} + \psi t + \delta^T RG_t + e_t \qquad t=1,...n \qquad (8)$$

Model 4: Regime Shift (C/S)
$$RR_t = \mu_1 + \mu_2 D_{t\tau} + \delta_1^T RG_t + \delta_2^T RG_t D_{t\tau} + e_t \qquad t=1,...n \qquad (9)$$

and

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[4] Authors like Quintos (1995), Papadopoulos and Sidiropoulos (1999) and Martin (2000) also documented the importance of the unusual exogenous events that may altered the conduct of fiscal policy in a country and the stress need for allowing the structural break in examining the sustainability of fiscal policy.

$$
D_{t\tau} = \begin{cases} 0 \; \textit{if } t \leq [n\tau], \\[2mm] 1 \; \textit{if } t > [n\tau], \end{cases}
$$

where μ_1 represents the intercept before the shift, μ_2 represents the change in the intercept at time of the shift, and t is a time trend. The unknown parameter $\tau \in (0, 1)$ denotes the (relative) timing of the change point and $[\ ]$ denotes integer part. The parameter δ_1^T denotes the cointegrating slope coefficients before the regime shift while δ_2^T denotes the change in the slope coefficients in Equation (8) which are consider the most general case that consider one time break point in both constant and trend (regime shift)[5].

The estimation of the relevant regression is performed sequentially in each breakpoint and calculated using the range of $\hbar = [0.15, \quad 0.85]$ interval. The breakpoint is identified as the one where the GH test statistic is maximized the absolute value at which the structural break occurred. The advantage of the GH procedure is that it determines the break point endogenously from the data set rather than on the basis of *a priori* information. Hence, the problem of data mining can be avoided by employing this procedure.

Estimation of Long run Equilibria

The JJ procedure may be used to extract the long-run parameters of the model. However, a more robust method proposed by Stock and Watson (1993) that also corrects for possible simultaneity bias among the regressors is considered in this paper[6]. The method involves estimation of the long-run equilibrium relationship using the dynamic OLS (DOLS) method. In this study, we relied on the technique devised by Stock and Watson (1993) that allows the (dynamic) estimation of cointegrating vectors for the system involving deterministic components.

Data Description

The empirical estimation period begins in 1975Q1 and ends in 2003Q2. In order to examine the effect of the 1997/98 currency crisis on the sampled economies, we also consider sub-sample periods. First, is the pre-crisis period starts in 1975:Q1 and ends in 1997:Q2. This period is coincides with the rapid growing phase of these crisis-affected countries. The second is the post-crisis period reflects the inclusion of the currency crisis era and the subsequent recovery years (1975:Q1-2003:Q2). Quarterly observations of the total government revenues and government expenditures (inclusive of the transfer payments and interest on the debt) and gross domestic product (GDP)[7] are sourced from International Monetary Fund's *International Financial Statistics* (IFS). The total government revenues and expenditures are converted into real terms by using the consumer price index (CPI 1995=100) and divided to real GDP in order to account for the economy's growth[8]. The real budget balances (BD) is constructed using BD = RR – RG. All the variables are expressed in domestic currency.

EMPIRICAL INVESTIGATION

Univariate Unit Root Tests Results

Table 1 displays the empirical results of the univariate tests performed on RR, RG and BD. Overwhelmingly, all the testing procedures suggest the existence of unit root in level or $I(1)$ series for all these countries. The finding

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[5] The dummy variable, $(D_{t\tau})$ is a sequence of zeros prior to the break point and ones thereafter. Specifically, for each τ, estimation of the above models (depending upon the alternative hypothesis) by OLS, yields the residuals $\hat{e}_{t\tau}$.

[6] They offer a parametric approach for estimating long-run equilibria in the system that involve variables integrated of different orders but still cointegrated. The possibility of simultaneity bias and small sample bias among the regressors is dealt with the inclusion of lagged and lead values of the first difference in the regressors. Moreover, Monte Carlo results show that the DOLS estimator has the lowest root mean square error (RMSE) and, therefore, performs well in finite samples relative to other asymptotically efficient estimators.

[7] Quarterly observations of GDP were extrapolated from the annual series employing the Gandolfo (1981) approach. For more detail exposition of the procedure see, Lau and Baharumshah (2004).

[8] The assumption of stationary interest rate rules out nominal magnitudes of the data since the nominal interest rate is the nonstationary variable (Hakkio and Rush, 1991).

that all the variables has the same order of integration allow us to proceed with the JJ multivariate cointegration analysis. Interestingly, BD also appears to be the nonstationary for these countries suggesting that the fiscal policies are on the unsustainable path for the sample period (Trehan and Walsh, 1991)[9].

Table 1: Unit Root and Stationary Tests

	Test Statistics				Conclusion
	t_μ	t_τ	η_μ	η_τ	
A: Level					
Malaysia					
RR	-1.417(4)	-1.148(4)	2.148(4)*	0.512(4)*	
RG	-0.570(2)	-3.150(2)	1.953(4)*	0.470(4)*	
BD	-1.243(4)	-0.533(4)	0.618(4)*	0.296(4)*	
Philippines					
RR	-2.289(4)	-0.498(4)	2.024(4)*	0.592(4)*	
RG	-1.178(2)	-0.316(2)	1.884(4)*	0.549(4)*	
BD	-0.052(4)	-0.931(4)	1.099(4)*	0.362(4)*	
Thailand					
RR	-1.538(4)	-1.402(4)	2.233(4)*	0.478(4)*	
RG	-1.599(4)	-1.429(4)	2.130(4)*	0.900(4)*	
BD	-1.568(3)	-1.551(3)	0.499(2)*	0.389(2)*	
B: First Differences					
Malaysia					
RR	-4.368(4)*	-4.779(4)*	0.141(4)	0.019(4)	I(1)
RG	-7.344(3)*	-9.116(3)*	0.108(4)	0.025(4)	I(1)
BD	-7.206(4)*	-7.642(4)*	0.063(4)	0.032(4)	I(1)
Philippines					
RR	-4.266(3)*	-4.584*(3)	0.097(4)	0.053(4)	I(1)
RG	-5.914(2)*	-8.928(2)*	0.167(4)	0.088(4)	I(1)
BD	-6.379(4)*	-7.098(4)*	0.063(4)	0.047(4)	I(1)
Thailand					
RR	-4.144(4)*	-4.734(4)*	0.330(4)	0.043(4)	I(1)
RG	-4.401(4)*	-4.889(4)*	0.348(4)	0.035(4)	I(1)
BD	-15.046(2)*	-15.117(4)*	0.051(2)	0.042(2)	I(1)

Notes: The t and η statistics are for ADF and KPSS respectively. The subscript μ in the model allows a drift term while τ allows for a drift and deterministic trend. Please refer to the main text for the notations. Asterisk (*) show significance at 5 percent level. The asymptotic and finite sample critical values for ADF is obtained from MacKinnon (1996) while the KPSS test critical values is obtained from Kwiatkowski *et al.* (1992, Table 1, pp. 166). The ADF examine the null hypothesis of a unit root against the stationary alternative while KPSS tests the null hypothesis that the series is stationary against the alternative hypothesis of a unit root. Δ denotes first different operator. To select the lag length, we adopted the recursive *t*-statistic procedure by Ng and Perron (1995) with an upper bound of k_{max} = 12. If the last included lag is significant, we would choose $k= k_{max}$. If not, we would reduce *k* by one until the last lag becomes significant. If no lags are significant then *k* is set to zero (*k*=0). The 5 percent value of the asymptotic normal distribution, 1.96 is used to assess the significance of the last lag. Figures in parentheses are the optimal lag lengths.

JJ Cointegration Results

We adopted the Akaike's information criterion (*AIC*) to determine the optimal lag length. The criteria yields VAR(5) is more appropriate for Malaysia and the Philippines while VAR(3) for Thailand. Despite the different lag length employed in the analysis, the residuals for each equation in the system do not exhibit any form of serial correlation or autoregressive conditional heteroskedasticity (ARCH) effects.

Table 2 presents the JJ cointegration test results. In general, the null hypothesis of no cointegrating vector in Panel A (post-crisis period) is rejected at 5 percent significance level for all the countries. Rejecting the null hypothesis of no cointegration between the *I*(1) variables appearing in Equation (5) implies that the two variables do not drift apart in the long-run.

Next, we re-examine the long run relationship using data that ends in 1997:Q2 (Panel B). The purpose is to test and compare the differences between the pre- and post-crisis periods for these economies in governing the macroeconomics of fiscal policy. As indicate in Panel B, the null hypothesis of no cointegrating vector (r=0) is

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[9] We also tested the univariate properties for the period between 1975:Q1 and 1997:Q2. The verdict is also in agreement with the *I(1)* properties for all the series. The results are not reported for the reasons of brevity.

rejected at conventional significance levels solely for Thailand. For the remaining countries, the data fail to reject the null of no cointegration, thus suggesting these countries were having problems with their internal imbalances. The absence of cointegration between the two variables system (RR, RG) in these two cases implies that there is no relationship between revenues and expenditures in the government financial structure for the sample period that ends in 1997:Q2. Also, the inability to reject the null of no cointegration in the majority of cases examined above might be due to the existence of structural break(s) that bias the test results in favor of accepting the null. This leads us to pursue further testing using an alternative procedure that can accommodate potential structural breaks in the data.

Table 2: JJ Cointegration Test Results

A: 1975:Q1-2003:Q2 (post-crisis period)						
Malaysia						
Null	Alternative			k=5 r=1		
			λ-max		Trace	
		Unadjusted	Adjusted	95% C.V.	Unadjusted	Adjusted	95% C.V.
r = 0	r = 1	26.039*	23.754*	15.870	26.083*	23.795*	20.180
r<= 1	r = 2	0.044	0.040	9.160	0.044	0.040	9.160
Philippines						
Null	Alternative			k=5 r=1		
			λ-max		Trace	
		Unadjusted	Adjusted	95% C.V.	Unadjusted	Adjusted	95% C.V.
r = 0	r = 1	29.338*	26.764*	15.870	32.460*	29.612*	20.180
r<= 1	r = 2	3.121	2.847	9.160	3.121	2.847	9.160
Thailand						
Null	Alternative			k=3 r=1		
			λ-max		Trace	
		Unadjusted	Adjusted	95% C.V.	Unadjusted	Adjusted	95% C.V.
r = 0	r = 1	30.319*	28.723*	15.870	34.793*	32.962*	20.180
r<= 1	r = 2	4.474	4.239	9.160	4.474	4.239	9.160
B: 1975:Q1-1997:Q2 (pre-crisis period)						
Malaysia						
Null	Alternative			k=5 r=0		
			λ-max		Trace	
		Unadjusted	Adjusted	95% C.V.	Unadjusted	Adjusted	95% C.V.
r = 0	r = 1	10.922	9.708	18.330	11.843	10.527	23.830
r<= 1	r = 2	0.920	0.818	11.540	0.920	0.818	11.540
Philippines						
Null	Alternative			k=3 r=0		
			λ-max		Trace	
		Unadjusted	Adjusted	95% C.V.	Unadjusted	Adjusted	95% C.V.
r = 0	r = 1	11.473	10.708	18.330	17.642	16.466	23.830
r<= 1	r = 2	6.170	5.759	11.540	6.170	5.759	11.540
Thailand						
Null	Alternative			k=3 r=1		
			λ-max		Trace	
		Unadjusted	Adjusted	95% C.V.	Unadjusted	Adjusted	95% C.V.
r = 0	r = 1	53.334*	49.778*	15.870	54.019*	50.418*	20.180
r<= 1	r = 2	0.685	0.639	9.160	0.685	0.639	9.160

Notes: Asterisk (*) denote statistically significant at 5 percent level. The k is the lag length and r is the cointegrating vector(s). Chosen r: number of cointegrating vectors that are significant under both tests. The unadjusted and the adjusted statistics are the standard JJ test statistics and the statistics adjusted for small sample correction factor based on Reinsel and Ahn (1992) methodology.

Structural Break Results

Table 3 summarized the results of the GH cointegration and the figures tabulated in the brackets indicate the break points detected from each of the particular model. For post-crisis period (Panel A), the first model (mean model) reveals that cointegration is present with a break only for Thailand (1988:Q3), implying that the data supports cointegration with one change in the intercept. The second model (level shift and trend model) failed to detect any significant presence of cointegration with a break for all the countries. Finally, the third model that takes into consideration of the simultaneous presence of both a mean break and a slope break (regime shift) exhibits empirical support for the case of Malaysia (1988:Q2) and the Philippines (1988:Q2). Meanwhile in Panel B (pre-crisis period), we only found cointegrating relationship between revenues and expenditures for Thailand. This finding appears to support the JJ test reported earlier in Table 2. Indeed, both of the cointegration tests indicated that Thailand are on the sustainable path (weak form) in governing the financial structure of the country. For the remaining countries, the results reveal that the countries are on an unsustainable path for the pre-crisis period.

Table 3: GH Cointegration Tests

Country	C	C/T	C/S
A: Period: 1975:1-2003:2			
Malaysia	-2.018	-4.069	-5.936*
	[1997:2]	[1988:2]	[1988:2]
Philippines	-2.184	-4.212	-5.262*
	[1989:1]	[1989:1]	[1988:2]
Thailand	-6.312*	-4.022	-7.307*
	[1988:3]	[1988:2]	[1989:2]
B: Period: 1975:1-1997:2			
Malaysia	-2.840	-2.534	-3.745
	[1988:2]	[1988:3]	[1989:1]
Philippines	-2.945	-2.485	-3.335
	[1993:1]	[1993:2]	[1993:1]
Thailand	-4.004	-3.807	-8.478*
	[1987:1]	[1989:1]	[1988:4]

Note: Asterisk (*) denote statistical significance at the 5 percent level. The critical values for models C [-4.61], C/T [-4.99] and C/S [-4.95] are obtained from of Gregory and Hansen (1996 Table 1 pp.109). Figures in [ ] refers to the breaking date.

The break points detected in the late 1980s by the GH test coincide with some major international events. First, the collapse of commodity prices due to the world recession (Plaza Accord and its aftermath) in the mid-1980s. The impact of such economic phenomena contributes to the significant break detected in the countries in the region. Second, the introduction of the Brady Plan in late 1980s that articulated new principles for addressing the LDC debt crisis with the focus on the Latin America countries. We move to the next section, by testing the necessary and sufficient condition (strong form) of sustainability hypothesis that would mitigate a clear conclusion on the subject matter.

Estimation of Long run Equilibria

The DOLS estimation results appear in Table 4. We also test whether the cointegration coefficient $b = 1$ (strong form of sustainability condition) is insignificantly different 1. First, we found that the null hypothesis of $b = 1$ is strongly rejected for Malaysia (Panel A), the Philippines (Panel B) and Thailand (Panel D) that supports the weak form of sustainability. This condition implies that the government expenditures are growing at the faster rate than the revenues. For example, an increase of RM 1.00 of government expenditures in Malaysia would rise the revenues by only RM 0.778. Following this development, the undiscounted stock of debts will reach infinity and makes the value of debt unbounded. This in turn would provide the incentives for this government to default on its debt. This supports the second scenario of sustainability condition outlined earlier.

Second, the DOLS results provide enough evidence to satisfy the solvency condition of the government intertemporal budget constraint (strong form of sustainability) only for Thailand (Panel C). This implies that the undiscounted value of the public debt goes to zero (transversality condition holds). As reported in ADB (2004) the Thai's economy had grown faster in 2003 than most other countries in the region. This fast economic expansion had strengthened the fiscal position, mainly through mounting tax revenues. With its first fiscal surplus amounting to 0.6 percent of GDP in 2003, the economy is in a position to generate a cushion to address a future slowdown using injections of government spending. This evidence also implies that despite the economic turmoil in 1997, the government of Thailand managed their financial structure efficiently while committed to the fiscal consolidation assessment in achieving the future positive growth prospects of the country.

Table 4: Dynamic OLS Estimation (DOLS)

Country	b	H_0: b = 1	AR(5)	ARCH (4)	RESET(4)	J-B	White
A: Malaysia (1975:1-2003:2)							
Model C/S	0.778	36.777*	1.503	1.730	1.895	1.973	0.682
B: Philippines (1975:1-2003:2)							
Model C/S	0.789	29.033*	2.324	2.201	0.265	0.741	0.849
C: Thailand (1975:1-2003:2)							
Model C/S	0.959	1.102	0.783	0.051	0.575	1.903	0.364
D: Thailand (1975:1-1997:2)							
Model C/S	0.842	7.342*	1.446	1.826	2.173	2.993	1.314

Note: The distributional properties of diagnostics are: LM (5) is a test of 5nd order serial correlation. ARCH (m) is an m-order test for autoregressive conditional heteroskedasticity. Ramsey's RESET (Regression Specification Test) test uses the square of the fitted values. J-B (Jarque-Bera) is the test of the normality of the residuals. The White general heteroscedasticity test is based on the regression of squared residuals on squared fitted values. Asterisks (*) denote significance at percent level. The break point selected for the DOLS estimation is based on the Gregory and Hansen results from Table 3. For Thailand, the break points are chosen on the basis of model C/S in both sampling periods.

Third, the estimated model that appears in Table 4 seems to be robust to various departures from the standard regression assumptions in terms of serial correlation of the residuals, autoregressive conditional heteroskedasticity (ARCH) effects, misspecification of functional form (RESET test), non-normality (Jarque-Bera test) and heteroskedasticity of residuals (White test). Furthermore, the CUSUM squares stability test is conducted for each of the estimated model. If the plot of the CUSUM squares sample path moves outside from the critical region (5 percent significant level), the null hypothesis of stability over time for the intercept and slope parameters is rejected (assuming the model is correctly specified). Using the empirical findings in Table 4, one may construct visual illustrations of 4 possible scenarios of CUSUM squares paths. Figure 1 plots the graphical paths of the CUSUMSQ test for these countries. Visual inspection for all the countries reveals that the plot of CUSUMSQ test fluctuates inside the 5 percent critical band. This implies that over the estimated period, the models are indeed stable and well specified.

Figure 1: CUSUM of Squares Test

(a) Malaysia
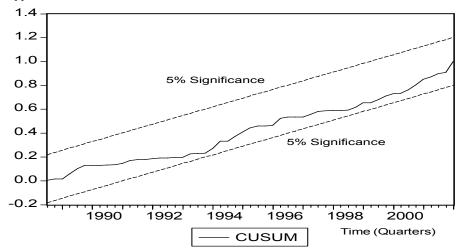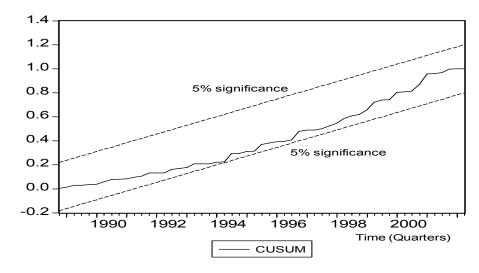
(b) Philippines
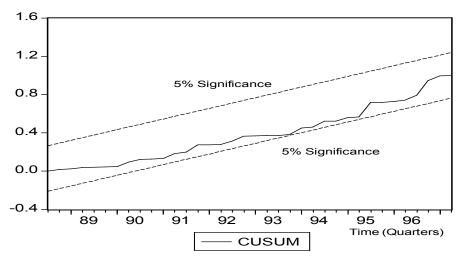
(c) Thailand (1975:1 – 2003:2)

(d) Thailand (1975:1 – 1997:2)

SUMMARY AND POLICY CONCLUSIONS

This paper tests whether the long run fiscal policy in three crisis-affected ASEAN countries is consistent with the sustainable condition by satisfying the government intertemporal budget constraint in the present value terms. These countries recorded budget imbalances in some of the years while surplus in the other years throughout the estimation periods. Using the critical statistical analysis, we outlined several important findings as follows.

First, prior to the crisis, revenues and expenditures do not share a common stochastic trend in such a manner that the internal imbalances were consistent with the government intertemporal budget constraint for most of the countries under investigation. In other words, we find the evidence of violation of the government intertemporal budget constraint prior to the crisis (strong form) and the weak form for Thailand. The growing fiscal imbalances in these countries had widened the current account deficit due to the close connection between them, termed as twin deficits. Specifically, the rise in the budget deficits leads to the appreciation of the currency that will adversely affected the current accounts for these countries (Lau *et al*, 2004). These further cause the macroeconomic imbalances and it distort the long-term economic progress of a country (Edwards, 2001 and Megarbane, 2002).

Second, in the post-crisis era it was observed that only Thailand is on a sustainable path (in strong form). In other words, the discounted value of the debt tends to converge to zero over time. There is no indication that the government of Thailand will tend to default on their debts. The possible action taken by the authorities had brought back the sustainability of fiscal position for Thailand. Meanwhile, the 1997 financial turbulence leaves the permanent unsustainable pressure to the Malaysian and the Philippines fiscal policies. In other words, these countries face the problem of having higher indefinite continuation of growth rate for expenditures compared to the growth rate of revenues. In the response to the post-crisis slowdown, both of the countries (especially Malaysia) actively implement the expansionary fiscal policies. For example, several stimulus packages covering a wide range of initiatives were implemented to rise spending and encourage private investment and consumption in Malaysia. These results also support the deficits recorded in the post-1997 periods for the two countries.

Third, we found that the government fiscal positions vary significantly across these countries. Despite the differences, the needs for fiscal consolidation and prudent fiscal policies instruments are essential for reducing public debt, improving operation of monetary and exchange rate policies while facilitating private sector-led growth. Consolidation in fiscal policy assists long term growth since countries with low deficits and debt levels can exercise more options over expenditure priorities and allocate more resources to productive sectors. Therefore, assessing, monitoring and maintaining stable and sustainable fiscal position is the key elements of the macroeconomic stability for an economy. These would bridge the road towards broader desire for economic, monetary and financial cooperation in the ASEAN region.

REFERENCES

Asian Development Bank (ADB), (2004), Asian Development Outlook, Manila.

Cashin, P., Haque, N.U. and Olekalns, N., 2003, Tax Smoothing, Tax Tilting and Fiscal Sustainability in Pakistan, *Economic Modelling*, 20, 47-67.

Chalk, N. and Hemming, R., 2000, Assessing Fiscal Sustainability in Theory and Practice, IMF Working Paper No.81.

Cheung, Y. W., and Lai, K. S., 1993, Finite-sample Sizes of Johansen's Likelihood Ratio Tests for Cointegration, *Oxford Bulletin of Economics and Statistics,* 55, 313-328.

Chung M. K., 2002, Fiscal Sustainability in the Wake of Economic Crisis in Korea, *Journal of Asian Economics*, 13, 659-669.

Edwards, S., 2001, Does Current Account Matter?, National Bureau of Economic Research (NBER), Working Paper No. 8275.

Edwards, S., 2002, Debt Relief and Fiscal Sustainability, NBER Working Paper No. 8939.

Feve, P. and Henin, P. Y., 2000, Assessing Effective Sustainability of Fiscal Policy within the G-7, *Oxford Bulletin of Economics and Statistics*, 62, 175-195.

Gonzalo, J., 1994, Five Alternative Methods of Estimating Long Run Equilibrium Relationships, *Journal of Econometrics,* 60, 203-233.

Green, C. J., Holmes, M. J. and T. Kowalski, T., 2001, Poland: A Successful Transition to Budget Sustainability? *Emerging Market Revie*w, 2, 160-182.

Gregory, A. W. and Hansen, B. E., 1996, Residual-Based Tests for Cointegration in Models with Regime Shifts, *Journal of Econometrics*, 70, 99-126.

Hakkio, C. S. and Rush, M., 1991, Is the Budget Deficit 'Too Large'?, *Economic Inquiry*, 29,429-425.

Hamilton, J. D. and Falvin, M. A., 1986, On the Limitations of Government Borrowing: A Framework for Empirical Testing, *American Economic Review*, 76, 808-819.

Hatemi-J, A., 2002, Fiscal Policy in Sweden: Effects of EMU Criteria Convergence *Economic Modelling*, 19, 121-136.

Johansen, S. and Juselius, K. 1990, Maximum Likelihood Estimated and Inference on Cointegration with Application to the Demand for Money, *Oxford Bulletin of Economics and Statistics*, 52, 169-210.

Kremers, J.J.M., 1988, Long Run Limits on the US Federal Debt, *Economics Letters*, 28, 259-262.

Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y., 1992, Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root. How sure are we that Economic Time Series have a Unit Root?, *Journal of Econometrics,* 54, 159-178.

Lau, E. and Baharumshah, A. Z., 2003, Sustainability of External Imbalances: The Case of Malaysia, *Singapore Economic Review,* 48, 61-80.

Lau, E. and Baharumshah, A.Z. 2004, On the Twin Deficits Hypothesis: Is Malaysia Different, Pertanika Journal of Social Science and Humanities, (Forthcoming).

Lau, E., Baharumshah, A. Z. and Liew, K. S., 2004, Transmission Mechanism of Twin Deficits Nexus: An Alternative Approach*, International Review of Economics and Business* (In press).

Liu, P. and Tanner, E., 1995, Intertemporal Solvency and Breaks in the US Deficit Process: A Maximum Likelihood Cointegration Approach, *Applied Economics Letters*, 2, 231-235.

MacDonald, R., 1992, Some Tests of the Government's Intertemporal Budget Constraint using US Data, *Applied Economics*, 24, 1287-1292.

MacKinnon, J. G., 1996, Numerical Distribution Functions for Unit Root and Cointegration Tests, *Journal of Applied Econometrics*, 11, 601-618.

Makrydakis, S., Tzavalis, E. and Balfoussias, A., 1999, Policy Regime Changes and the Long-Run Sustainability of Fiscal Policy: An Application to Greece, *Economic Modelling*, 16, 71-86.

Martin, G. M., 2000, US Deficit Sustainability: A New Approach on Multiple Endogenous Breaks, *Journal of Applied Econometrics*, 15, 83-105.

Megarbane, P., 2002, Slovakia's External Current Account Deficit: Why so Large and Is It Sustainable?, Country Report 210, IMF, Washington D.C.

Ng, S., and Perron, P., 1995, Unit Root Tests in ARMA Models with Data Dependent Methods for the Selection of the Truncation Lag, *Journal of the American Statistical Association*, 90, 268-281.

Oleklans, N., 2000, Sustainability and Stability? Australian Fiscal Policy in the Twentieth Century, *Australia Economic Papers*, 39, 138-151.

Osterwald-Lenum, M., 1992, A Note with Quantiles of the Asymptotic Distribution of Maximum Likelihood Cointegration Rank Test Statistic, *Oxford Bulletin of Economics and Statistics,* 54, 461-472.

Papadopoulos, A. P. and Sidiropoulos, M. G., 1999, The Sustainability of Fiscal Policies in the European Union, *International Advances of Economic Research*, 5, 289-307.

Payne, J., 197, International Evidence on the Sustainability of Budget Deficits, *Applied Economics Letters*, 4, 775-779.

Quintos, C. E., 1995, Sustainability of the Deficit Process with Structural Shifts, *Journal of Business and Economic Statistics*, 13, 409-417.

Reinsel, G. C. and Ahn, S. K., 1992, Vector Autoregressive Models with Unit Roots and Reduced Rank Structure: Estimation, Likelihood Ratio Test and Forecasting, *Journal of Time Series Analysis*, 13, 353-375.

Said, E. S. and Dickey, D., A., 1984. Testing for Unit Roots in Autoregressive-Moving Average Models of Unknown Order, *Biometrika,* 71, 599-607.

Smith, G. W. and Zin, S. E., 1991, Persistent Deficits and the Market Value of Government Debt, *Journal of Applied Econometrics*, 6, 31-44.

Stock, J. H. and Watson, M. W., 1993, A Simple Estimator of Cointegrating Vectors in Higher Order Integrated Systems, *Econometrica*, 61, 783-820.

Tanner, E. and Liu, P., 1994, Is the Budget Deficit "too large"?: Some Further Evidence, *Economic Inquiry*, 32, 511-518.

Trehan, B. and Walsh, C. E., 1988, Common Trends, the Government Budget Constraint and Revenue Smoothing, *Journal of Economics Dynamics and Control*, 12, 425-444.

Wilcox, D. W., 1989, The Sustainability of Government Deficits: Implications of the Present Value Borrowing Constraint, *Journal of Money, Credit and Banking*, 21, 291-306.

Wu, J. L., 1998, Are Budget Deficits "Too Large"?: The Evidence from Taiwan, *Journal of Asian Economics*, 9, 519-528.

Economic Interdependence: Asia Pacific Region

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ABSTRACT

The Euro was adopted as the common currency among 12 out of 25 members of the European Union (EU). Many economies are eager to heed the same path as the EU in the name of promoting trade, eliminating exchange rate uncertainty, and sustaining economic growth. However, potential members will have to at least demonstrate some form of macroeconomic interdependence or synchronisation prior to the formation of an economic union. In this study, we examine the level of economic interdependence among several countries within the Asia-Pacific region. We employed the augmented VAR of Granger non-causality test in order to apprehend the level of synchronisation and interdependence among these countries. The empirical findings support APEC's effort of economic co-operation that will pave the way for a possible Asia Pacific economic union in the near future.

INTRODUCTION

The success adopting of Euro has sparked the interest in the field of economic and monetary integration, especially among developing economies in the Asian region. The reason causing such eagerness is that an integrated economy has the potential in promoting trade, reducing transaction cost, eliminating exchange rate uncertainty, and sustaining economic growth.

Earlier studies on economic integration have centred on the optimum currency area (OCA) theory. The OCA theory stressed on the importance of labour mobility (Mundell, 1961), openness of an economy (McKinnon, 1963) and product differentiation (Kenen, 1969) as criteria necessary to form an OCA. Based on these fundamental criteria, recent researchers proposed other essential elements that are pre-requisites to form an OCA, namely having stable or fixed exchange rate, facing symmetrical shocks, increasing trade and capital flows, experiencing coherent macroeconomic activities where fiscal and monetary are co-ordinated.

Besides these OCA criteria, the possibility of an economic union can also be determined by conducting a marginal benefits – marginal cost analysis of integration. Only when the benefits in terms of increased trade, foreign direct investment and economic growth, exceeds the cost of giving up monetary policy independence, that potential members should proceed to form an economic union.

As for the case of the European Monetary Union, it evaluates the compatibility of economies through institutional convergence criteria. The EU established a set of "convergence criteria" to be fulfilled by countries

desired to adopt the common currency Euro. Countries that fulfil the convergence criteria that are specifically spelt out in the Maastricht Treaty will be eligible to form Euro area.

The purpose of this paper is to provide an initial avenue of the prospect of Asia-Pacific Economic Co-operation (APEC) economies to form a union. In this study, we employed the correlation analysis and the augmented VAR of Granger non-causality test in order to gauge the level of interdependence among APEC economies. A strong level of economic interdependence suggests possible policy co-ordination for greater Asia-pacific integration and a weak interdependence suggests otherwise.

In the next section of this paper, we present a brief review of some related literature, to be followed by a discussion on the estimation techniques used and empirical results obtained. We end our discussion by offering some concluding remarks.

PREVIOUS STUDIES

Based on the World Development Indicators (2000), there are four main groups of economic blocs, namely, the Asia Pacific, European and North American bloc, the Latin American and the Caribbean, African, as well as the Asian economic blocs. The *Asia Pacific Economic Co-operation (APEC)* is classified under the Asia Pacific, Europe and North American economic blocs, which also include the *European Union (EU)* and the *North American Free Trade Association (NAFTA)*.

Generally, economic integration refers to economic interdependence or linkages between states, countries, and grouping of countries or regions. The flow of trade, capital, labour and technology across countries are evidence of economic linkages (O'Neill, 2002). The degree of economic integration, however, ranges from establishing free trade areas, customs unions, common markets, economic and political unification among member nations (Balassa, 1961).

Mundell (1961), McKinnon (1963) and Kenen (1969) provide a theoretical basis from which the formation of monetary integration is examined. In more recent studies, more criteria were introduced and other measures were designed to test the compliance of OCA theory among countries wanting to form a common currency. These recent studies re-tested the existing criteria as well as proposed other criteria complementing the existing OCA properties (see Shin and Wang, 2003; Sayek and Selover, 2002; Mongelli, 2002; Kose and Engel, 2002; Choe, 2001).

Studies that examined the compatibility of Asian or Asia Pacific economy to form an economic integration include those conducted by Crosby, 2003; Hallett and Piscitelli, 2002; O'Neill, 2002; Dueker and Wesche, 2001; Clark and Wincoop, 2001; Choe; 2001; Ling, 2001; Bayoumi and Maoro, 1999; Dent, 1998; Bayoumi and Eichengreen, 1994. This paper attempts to fill the gap in literature by studying the interdependence of Asia Pacific economies with more annual data for sampling period between 1960 to 2002.

ESTIMATION TECHNIQUE

Using logged data, we employ the augmented VAR procedure introduced by Toda and Yamamoto (1995), extended by Rambaldi and Doran (1996). The augmented VAR method guarantees the asymptotic distribution of MWald statistic and does away with the problem of co-existence of both a unit root and cointegration (Zapata and Rambaldi, 1997).

The augmented VAR utilises a modified WALD test for restrictions on the parameters of a VAR(ρ) or MWald procedure, where k is the lag length in the system, and is shown by Rambaldi and Doran (1996), computed as Seemingly Unrelated Regression (SUR). To perform the Granger non-causality test, it is required to determine a lag length (k), and to estimate $(k + d_{max})$ order of VAR formulated in levels where d_{max} is the maximum order of integration suspected to occur in the system.

We choose the true lag length (k) using the Schwart Bayesian Criterion (SBC). If the lag length, k is 1, we set our estimation of the system of SUR VAR(2) that is where k=1 and d_{max}=1. We estimate our system of VAR ($\rho = d_{max} + k = 2$) as follows:

$$
\begin{bmatrix} YMY_t \\ YPH_t \\ YSP_t \\ YTH_t \\ YID_t \\ YAU_t \\ YJP_t \\ YNZ_t \end{bmatrix} = A_0 + A_1 \begin{bmatrix} YMY_{t-1} \\ YPH_{t-1} \\ YSP_{t-1} \\ YTH_{t-1} \\ YID_{t-1} \\ YAU_{t-1} \\ YJP_{t-1} \\ YNZ_{t-1} \end{bmatrix} + A_2 \begin{bmatrix} YMY_{t-2} \\ YPH_{t-2} \\ YSP_{t-2} \\ YTH_{t-2} \\ YID_{t-2} \\ YAU_{t-2} \\ YJP_{t-2} \\ YNZ_{t-2} \end{bmatrix} + A_3 \begin{bmatrix} \varepsilon_{YMY_t} \\ \varepsilon_{YPH_t} \\ \varepsilon_{YSP_t} \\ \varepsilon_{YTH_t} \\ \varepsilon_{YAU_t} \\ \varepsilon_{YJP_t} \\ \varepsilon_{YNZ_t} \end{bmatrix}
$$

where, YMY_t is the nominal GDP of Malaysia at time t; YPH_t is the nominal GDP of Philippines at time t; YSP_t is the nominal GDP of Singapore at time t; YTH_t is the nominal GDP of Thailand at time t; YID_t is the nominal GDP of Indonesia at time t; YAU_t is the nominal GDP of Australia at time t; YJP_t is the nominal GDP of Japan at time t; YNZ_t is the nominal GDP of New Zealand at time t; ε_t is the error term; A_1 and A_2 are eight times eight matrices of coefficient and A_0 is an identity matrix.

To test the hypothesis, that non-Granger causality from YPH_t to YMY_t, we test $H_0 : a_{12}^1 = a_{12}^2 = 0$, where a_{12}^i are coefficients of YPH_{t-1} and YPH_{t-2} in the first equation of the system stated above. A causality from YPH_t to YMY_t can be established through rejecting the above null hypothesis which requires finding the significance of the MWald statistic for the group of the lagged independent variables identified above. Alternatively, testing procedure can be applied to the alternative hypothesis that non-Granger causality from YMY_t to YPH_t by testing $H_0 : a_{21}^1 = a_{21}^2 = 0$, where a_{21}^i are the coefficients of YMY_{t-1} and YMY_{t-2} in the second equation of the system. Similar testing procedure is repeated to test Granger non-causality for the remaining variables.

In this paper, we use annual time series of nominal GDP, measured in domestic currency for the sampling period from 1960 to 2002. We obtained our data from the International Financial Statistics published by the International Monetary Fund.

EMPIRICAL FINDINGS

The correlation matrix of GDP for ASEAN-5, Australia, New Zealand and Japan of reveals strong relationship among the economies under study. The positive correlation coefficient shown in Table 1 reveals strong direct association between GDP of each ASEAN-5 countries, Australia, New Zealand, and Japan.

Table 1: Correlation Matrix of Variables

	Australia	Indonesia	Japan	Malaysia	New Zealand	Philippines	Singapore	Thailand
Australia	1.0000	0.9197	0.9742	0.9920	0.9988	0.9970	0.9961	0.9956
Indonesia		1.0000	0.9682	0.8958	0.9112	0.9087	0.9221	0.9103
Japan			1.0000	0.9502	0.9712	0.9607	0.9721	0.9617
Malaysia				1.0000	0.9883	0.9971	0.9952	0.9973
New Zealand					1.0000	0.9946	0.9931	0.9928
Philippines						1.0000	0.9968	0.9980
Singapore							1.0000	0.9975
Thailand								1.0000

For the augmented VAR analysis, the true lag length (*k*) is determined via the Schwart Bayesian Criterion (SBC), which is presented in Table 2.

Table 2: Choice Criteria for Selecting the Order of the VAR Model

NLagr	SBC
1	194.65*
2	189.93
3	183.02

Note:
  i)   SBC = Schwarz Bayesian Criterion
  ii) Nlag = the number of lags used in VAR
  iii) * shows the largest value of SBC

From Table 2, the highest SBC value indicates that lag length $k=1$ is selected. Hence, we run the augmented VAR(2). The results for VAR(2) revealed that the null hypothesis of Granger non-causality from GDP of Indonesia to GDP of Japan and New Zealand is rejected at 5% level. The null hypothesis of Granger non-causality from GDP of Japan to GDP of Malaysia, Philippines, Singapore and Thailand are also rejected at 5% level. At 5% level, Granger non-causality from GDP of Malaysia to GDP of Indonesia and Philippines; GDP of Philippines to GDP of Malaysia; as well as GDP of Singapore to GDP of Australia; are all rejected.

The null hypothesis of Granger non-causality from GDP of Thailand to GDP of Singapore is also rejected at 1% level of significance. In addition, GDP of Australia, Indonesia, Japan, New Zealand, Malaysia, Philippines, Singapore and Thailand are found to be influence by its own GDP of lag 1 at 1% level.

Besides, bi-directional causality is discovered from GDP of Malaysia and Philippines at 5% level, GDP of Indonesia and Japan at 10% level, and GDP of Singapore and Japan at 10% level. The output of these augmented VAR Granger non-causality tests are presented in Table 3.

Table 3: Granger Non-Causality Tests Results

		AU	ID	JP	MY	NZ	PH	SG	TH
AU	MWald test	26.344	0.476	0.088	0.003	1.873	0.021	4.518	0.107
	ρ value	0.00**	0.490	0.767	0.958	0.171	0.886	0.034*	0.744
ID	MWald test	2.210	26.098	3.217	5.390	1.074	0.021	2.130	1.149
	ρ value	0.137	0.000**	0.073	0.020*	0.300	0.884	0.144	0.284
JP	MWald test	0.004	4.858	30.239	1.178	0.030	0.831	3.658	2.012
	ρ value	0.947	0.028*	0.000**	0.278	0.862	0.362	0.056	0.156
MY	MWald test	0.025	0.101	4.179	18.725	0.336	4.571	0.400	2.463
	ρ value	0.874	0.751	0.041*	0.000**	0.562	0.033*	0.527	0.117
NZ	MWald test	3.108	6.451	0.339	2.704	55.017	1.837	0.375	0.361
	ρ value	0.078	0.011*	0.560	0.100	0.000**	0.175	0.540	0.548
PH	MWald test	0.818	0.873	4.061	6.196	0.000	6.460	0.991	2.029
	ρ value	0.365	0.350	0.044*	0.013*	0.994	0.011*	0.319	0.154
SG	MWald test	1.315	0.810	4.583	1.191	0.623	3.103	22.072	7.737
	ρ value	0.252	0.368	0.032*	0.275	0.430	0.078	0.000**	0.005**
TH	MWald test	1.286	2.206	3.947	3.562	0.002	2.509	1.432	44.757
	ρ value	0.256	0.138	0.047*	0.059	0.965	0.113	0.140	0.000**

Note:
  i)   The vertical axis denotes explained variable while the horizontal shows the explanatory variable.
  ii) ** denotes significant at 1% level
  iii) * denotes significant at 5% level.

CONCLUDING REMARKS

In this paper, we explore the prospects of APEC forging an economic integration by examining the interdependence of ASEAN-5, Australia, New Zealand and Japan macroeconomic activities via the augmented VAR of Granger non-causality test. Our findings suggested that there is some interdependence among ASEAN-5, and Japan, the leading economy in East Asia.

There is also evidence of bi-directional causality among Malaysia and Philippines, Indonesia and Japan, as well as Singapore and Japan. These initial findings support APEC's effort of economic co-operation that will pave the way for a possible Asia Pacific economic union in the near future.

REFERENCES

Balassa, B. (1961). *The theory of economic integraion*. Homewoeed, IL: Irwin.

Bayoumi, T., & Eichengreen, B. (1994). One money or many? Analysing the prospects for monetary unification in various parts of the world. *Princeton Studies in International Finance*.

Bayoumi, T., & Mauro, P. (1999). *The suitability of ASEAN for a regional currency arrangement*. International Monetary Fund, Working Paper, WP/99/162.

Choe, J.I. (2001). An impact of economic integration through trade: On business cycles for 10 East Asian countries. *Journal of Asian Econ*omics, *12*, 569-586.

Clark, T.E., & Wincoop, E.V. (2001). Borders and business cycles. *Journal of International Economics*, *55*, 59-85.

Crosby, M. (2003). Business cycle correlations in Asia-Pacific. *Economic Letters*, *80*, 35-44.

Dent, C.M. (1998). Regionalism in South East Asia: Opportunities and threats for the European Union. *European Business Review*, *98*(4), 184-195.

Dueker, M., & Wesche, K. (2001). *European business cycles: New indices and analysis of their synchronicity*. Federal Reserve Bank of St. Louis, Working paper 1999-019B.

Hallett, A.H., & Piscitelli, L. (2002). Does trade integration cause convergence? *Economic Letters*, *75*, 65-170.

Kenen, P.B. (1969). The theory of optimum currency areas: An eclectic view. In Robert Mundell and Alexander Swoboda (Eds.), *Monetary problems of the international economy*. University of Chicago Press.

Kose, A.K., & Engel, C. (2002). Currency unions and international integration. *Journal of Money, Credit, and Banking*, *34*(4), 1068-1089.

Ling, H.Y.P. (2001). Optimum currency areas in East Asia: A structural VAR approach. *ASEAN Economic Buletin*, *18*(2), 206-217.

McKinnon, R.I. (1963). Optimum currency areas. *American Economic Review*, *53*(4), 717-725.

Mongelli, F.P. (2002). *"New" views on the optimum currency area theory: What is EMU telling us?* European central Bank, Working Paper No. 138.

Mundell, R.A. (1961). A theory of optimum currency areas. *American Economic Review*, *51*(4), 657-665.

O'Neill, T. (2002). *North America economic integration and its application to Canadian banks*. Bank of Montreal.

Rambaldi, A.N., & Doran, H.E. (1996). *Testing for granger non-causality in cointegrated systems made easy*. Working papers in econometrics and applied statistics, Department of Econometrics, University of New England : Armidale NSW.

Sayek, S., & Selover, D.D. (2002). International interdependence and business cycle transmission between Turkey and the European Union. *Southern Economic Journal*, *69*(2), 206-238.

Shin, K., & Wang, Y. (2003, October). *Trade integration and business cycle synchronisation in East Asia*. Paper presented at the meeting of Asian Economic Panel, Columbia University, NY.

Toda, H.Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possible near integrated processes. *Journal of Econometrics*, *66*, 225-250.

Zapata, H.O., & Rambaldi, A.N. (1997). Monte Carlo evidence on cointegration and causation. *Oxford Bulletin of Economics and Statistics*, *59*, 285-298.

Factors Influencing Foreign Direct Investment in the Malaysian Services Sector: A Conceptual Framework

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ABSTRACT

Over the past few years, Foreign Direct Investment (FDI) has played an enormous role in the development and growth of the Malaysian economy.At the initial stage, most of these FDI flowed into the manufacturing sector due to the availability of cheap and abundant manual labour. The pro-active strategies of the Malaysian government that came up with numerous incentives and open door policy further attracted MNCs to locate their production plants here. However, as Malaysia grew rapidly over the last few years, the scenario slowly shifted when labour cost started to rise rapidly in the 1990s. Malaysia became less attractive for FDI in labour intensive manufacturing and some MNCs even decided to relocate their plants to neighbouring countries such as Indonesia, Thailand, Vietnam and even China that offered much cheaper labour. Since the financial crisis hit Malaysian in 1997, the slowdown of FDI inflows has been a key concern. In the mid 1990s, due to accelerating labour costs, the government started to emphasise more on the service sector and has identified it as a key area of growth in the future. This was in line with plans to shift away from a production-based to a knowledge-based economy. The service sector is poised to be the main engine of growth in the future. The proliferation of the information and communication industry and further deregulation and liberalisation have spurred the consumption of services, particularly in finance, transport and telecommunication sectors. The factors influencing FDI into the manufacturing sector may not be the same for the services sector.As such, it is imperative that more emphasis is given to FDI research in services since there is scarcity of theoretical frameworks in this area. In fact, theory seems to be lagging behind practice in the internationalisation of services research (Clark et al. 1996 cited in Gronroos 1999, p.9).The main objective of this research is to examine and analyse FDI by MNCs in the Malaysian services sector. This paper attempts to develop a conceptual framework that will be used for future research in identifying the factors influencing FDI in the Malaysian service sector. Although there are many factors influencing FDI by MNCs in general, it is still not clear if these factors also apply to the service sector.

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INTRODUCTION

Background to the study

There are many definitions of Foreign Direct Investment (FDI). For the purpose of this research, the FDI definition by United Nations Conference on Trade and Development (UNCTAD) is used. FDI is defined by UNCTAD (2002) as the following:

> 'FDI is defined as an investment involving a long term relationship and reflecting a lasting interest and control of a resident entity in one economy in an enterprise resident in an economy other than that of the foreign direct investor. An equity capital stake of 10% or more of the ordinary shares or voting power of an   incorporated enterprise, or its equivalent for an unincorporated enterprise, is normally considered as a threshold for FDI'

It is however, important, to distinguish FDI from portfolio investment. Portfolio investments are purchases of foreign financial assets such as stocks, bonds and certificates of deposit (Griffin & Pustay 1998). The distinguishing factor here is control. In the case of portfolio investment, there is usually no interest to obtain control over an enterprise. Portfolio investment is usually undertaken to acquire financial returns. Since, this research is confined to the services sector in Malaysia, the emphasis will be on FDI by Multinational Companies (MNCs) in services that are commercially present in the host country. This investment will be referred to as throughout this research as service FDI and the foreign investors will be referred to as service MNCs.

Foreign Direct Investment (FDI) has become one of the main forces of sustaining the high economic growth and development Malaysia has achieved over the years. The FDI was brought mainly by Multinational Corporations

(MNCs) from all over the world who not only brought capital but technology, management expertise etc. Due to shortage of funds domestically and the small size of the private sector, Malaysia became highly dependent on FDI brought by these MNCs. At the initial stage, most of these FDI flowed into the manufacturing sector due to the availability of cheap and abundant manual labour. The pro-active strategies of the Malaysian government that came up with numerous incentives and open door policy further attracted MNCs to locate their production plants here. However, as Malaysia grew rapidly over the last few years, the scenario slowly shifted when labour cost started to rise rapidly in the 1990s. Malaysia became less attractive for FDI in labour intensive manufacturing and some MNCs even decided to relocate their plants to neighbouring countries such as Indonesia, Thailand, Vietnam and even China that offered much cheaper labour.

Why is FDI so important? FDI has played an effective role as a source of financing to a lot of developing countries. Although the impact of FDI on economic development is debatable, there are many empirical findings that support its positive contributions. Research by Mbekeani (1999) on the impact of FDI on domestic investment, exports and economic growth showed positive relationship in Mexico and Malaysia. Another research by Larrain, Luis & Andres (2001) showed positive effect of FDI generated by Intel in terms of net exports, investment, wages and benefits and local purchases for the Costa Rican economy. Thomsen (1999) in his study on the role of FDI in 69 developing countries found that it not only stimulates economic growth but also has a larger impact than investment by domestic firms. Developing countries are thus, competing to attract FDI into their economy. There are many factors that attract the movement of FDI throughout the world. These factors may differ significantly from one location to another depending again on the attractiveness of the particular region or country.

RESEARCH PROBLEM

There is enormous literature available on the subject of FDI. However, most of the empirical and theoretical research has been investigating manufacturing and production FDI. Research on FDI in the service sector is very much lacking. This view is supported by Chandraprapalert (2000) in his research on FDI in Thailand and Von Der Ruhr (2000) in his research on FDI in services. Even the theories of FDI and MNCs were originally developed to explain FDI in the manufacturing sector and only lately its application is being extended to the services sectors (Tatoglu and Glaister 1998).

The slowdown of FDI inflows has been a key concern since the financial crisis. The overall value of FDI in 2002 was only 11.2 billion, a decline of 41% from 18.9billion in 2001(Nathan 2003). From 1997 to 2001, the overall decline was 8.6% per annum against a substantial increase of 20.4% per annum during the period 1980 - 1996 (Nathan 2003). This decline would have huge implications on the future development of the Malaysian economy. With further competition from China in attracting FDI, the overall FDI inflows may further deteriorate in the future.

Relying on tax incentives alone is not enough to woo FDI into Malaysia since most of our competitors are also offering similar if not better tax incentives (Lim 2002).In the mid 1990s, due to accelerating labour costs, the government started to emphasise more on the service sector and has identified it as a key area of growth in the future. This was in line with plans to shift away from a production-based to a knowledge-based economy. The service sector is poised to be the main engine of growth in the future. The proliferation of the information and communication industry and further deregulation and liberalisation have spurred the consumption of services, particularly in finance, transport and telecommunication sectors.

It was noted that service sectors share of GDP have been rising gradually from 46.8% in 1990 to nearly 57% in 2003 (Business Times, Tuesday, Feb 3 2004). This is actually in line with the country's steady program towards achieving industrialised nation status where services sector generally account for about 70% of GDP. Despite all these favourable indicators, the service sector is still highly regulated in Malaysia. The Malaysian Government still refuses to grant new licenses to private providers of telecommunication services or prohibit establishment of new foreign banks and expansion of existing foreign banks. However, the government has given full commitment to deregulate and liberalise the financial sector by 2007. The government must shift its emphasis to further attract FDI into the services sector since this area has vast potential for Malaysia in the future. The service sector is very important to an economy because services are inputs for all aspects of processing. The services sector provides much of the necessary infrastructure for investment and economic growth and its efficient delivery is important to improve an economy's overall productivity. The services sector is also a high technology and highly educated labour venture that could benefit Malaysia in terms of adding greater value to the services produced.

The factors influencing FDI into the manufacturing sector may not be the same for the services sector. Tatoglu and Glaister (1998) argued that some factors influencing FDI may be more important for services than for manufacturing and thus, there is a need to further uncover such differences. Services are known to have idiosyncratic characteristics where workers employed are more educated with higher level skills and as such are different from the manufacturing sector in attracting FDI (Erramilli and Rao 1993). Services are also different due to its intangibility, non-storability and non-transportability that make it unique in its own sense. There is a need therefore, to clear the void that exists and determine exactly whether the current determinants of FDI in the literature are applicable across the board for all industries or sectors.

Recently, a lot of foreign call centres have been establishing their base in Malaysia. This is another example of FDI in the service sector. According to Stephen Shepherd, Kelly Services Regional Director for Sales and Operation (Asia Pacific), Malaysia is becoming an important contact centre hub and a better choice for global companies to locate their call centres (Business Times, 26 December 2002). The Multimedia Super Corridor (MSC), the country's test bed for the development and application of sophisticated information technology is also a host to MNCs such as DHL, Alcatel Networks, Acterna, Shell IT, British American Tobacco, Scope International -Standard Chartered (Business Times, 23 April 2002). He further reiterated that many MNCs are even relocating their call centres from Singapore and the Philippines to Malaysia. Industries that are relying heavily in the contact centre services in the country are banking, telecommunications, insurance, transportation and logistics.

According to the Asian Call Centre Industry Benchmark Study in 2003, Malaysia has about 575 contact centres and is placed at par with Singapore, Thailand and Hong Kong (The Star, BizWeek 4 October 2003 p.27) . There is a need to investigate in detail what are the factors behind such decisions from foreign service MNCs. With liberalisation taking place rapidly in the services sector, there is poised to be greater competition to attract service MNCs in such industries in the near future. Malaysia needs to gear up to remain ahead and be more attractive than their neighbours who are fast catching up.

Lately, many MNCs are also setting up or relocating their regional Operating Head Quarters (OHQ) to Malaysia. Malaysia is therefore seen as an attractive location for setting up regional OHQs. This was part of a push by MNCs to outsource shared services to lower cost regions in the face of increased competition globally and cost pressures at home. By consolidating back room operations such as accounting for the entire region in one location, companies could save on staff, processing and hardware cost (Lee 2003). Regional OHQs also provide 'qualifying services' such as management administration, corporate financial advisory, training and treasury and fund management to its related companies outside the host countries (Lee 2003). There are currently over one hundred companies that have shifted their regional OHQs to Malaysia (Lee 2003).

According to Idris (2003), Malaysia is also an ideal regional hub for outsourced call centre operations due to its proximity to high growth centres around South East Asia and excellent telecommunication infrastructure with multilingual capable workforce. All these factors points out that Malaysia should focus on the services sector in order to get ahead of the learning curve and compete in a globalised economy. The thinning margins in manufacturing and the rise of China as the 'factory of the world' has left manufacturing dependent countries like Malaysia with little choice (Matthews 2003).

There is vast literature available on FDI but most of it emphasises on the study of manufacturing MNCs (Wilkins 1977; United Nations 1978; Tatoglu & Glaister 1998; Von Der Ruhr 2000; Molina Lacayo 2003 Li, Wang & Zhai 2003; Chandraprapalert 2000 and Gronroos 1999). One reason for this may be due to the strong dominance of manufacturing MNCs in the early stage of foreign expansion. However, service MNCs are beginning to play a more prominent role due to the huge contribution of services to GDP in most developed and newly developed countries. Today, the service sector contributes close to 70% to GDP in most developed countries (UNCTAD/WTO 2002).

As such, it is imperative that more emphasis is given to FDI research in services since there is scarcity of theoretical frameworks in this area (Herrero & Simon 2003). In fact, theory seems to be lagging behind practice in the internationalisation of services research (Clark et al. 1996 cited in Gronroos 1999, p.9).

RESEARCH QUESTIONS

The problem statement above has established that there is a need to uncover the underlying factors influencing the inflow of FDI into the services sector. Service MNCs internationalisation using FDI is a grey area that needs further investigation. With this respect, the following research questions are formulated to guide this research:

1. What are the factors influencing MNCs to engage in FDI in the Malaysian service sector?
2. Can traditional theories that explain FDI flows into the manufacturing sector be applied to the services sector?

RESEARCH OBJECTIVES

The main objective of this research is to examine and analyse FDI by MNCs in the Malaysian services sector. This paper attempts to develop a conceptual framework that will be used for future research tin identifying the factors influencing FDI in the Malaysian service sector. Although there are many factors influencing FDI by MNCs in general, it is still not clear if these factors also apply to the service sector. It is the aim of this investigation to uncover those factors that may be more relevant to service MNCs.

IMPORTANCE OF THE STUDY

Malaysia needs FDI to complement domestic investment for the purpose of increasing its wealth in today's globalised world. FDI has had enormous contribution to the economic development of Malaysia since the mid 80s. However, the scenario is fast changing, with many developing countries like China, Thailand and India competing aggressively to attract FDI. Since the 1980s, the government has been practicing a liberal policy towards FDI. Over the years, the government has provided numerous incentives to attract more FDI into the country. However, other countries are also providing incentives and as such the situation is becoming more competitive and difficult to attract FDI. The question now is, to attract the right kind of FDI since the labour intensive manufacturing sector is losing its competitiveness to low - wage countries in the region. This research has identified a number of significance that is outlined below:

1) FDI has contributed positively to Malaysia's economic development since mid 80s and as such it is vital for us to continue attracting such investment.
2) Discovering the factors influencing FDI in services is vital to further assist the government in policy formulation for the future.
3) The service sector contributes more than half of Malaysia's GDP and as such, is important for the government to further sustain its growth. Identification of the major factors influencing FDI in services is beneficial in the long run to further sustain and increase the sectors development.
4) Identification of new factors not known earlier can help Malaysia increase its competitive advantage

LITERATURE REVIEW

Theoretical Underpinnings behind ForeignDirect Investment

Why does a firm undertake FDI? Logically, an MNC is bound to incur additional transportation costs, face language and tax barriers and may face the risk of expropriation if it decides to move abroad. However, despite all these problems, MNCs are still rapidly crossing borders and expanding their businesses all over the world through FDI. Theoretically, the origins of FDI can be traced back by examining the work done by Vernon (1966), Kindleberger (1969), Hymer (1976), Knickerbocker(1973), Buckley and Casson (1976), Hennart (1982), Caves (1982) and Dunning (1977, 1980, 1981). Basically, the theories explaining FDI can be categorised into six groups.

Firstly, there is the imperfect market argument, which is based on transaction cost theory. This theory explains why MNCs should internalise their operations (Hymer 1976 & Hennart 1982). According to this theory, market imperfections arise due to barriers such as tariffs and foreign exchange controls that restrict the free flow of goods between nations. To avoid such barriers, it is better for MNCs to move abroad through FDI instead of exporting or licensing its products. Furthermore, the transaction costs of exporting or licensing is much higher since the MNCs may incur costs of search, costs of negotiation, costs related to enforcement of contract, transport cost and payment of taxes (Hill 2001). This justifies the reason for shifting production abroad.

Secondly, there is the product life cycle theory by Vernon (1966) which states that the production location for products moves from one country to another depending upon the stages of the product's life cycle. In other words, MNCs undertake FDI in other countries once demand there grows large enough to support local production and the domestic market is saturated and facing rising cost of labour. Hill (2001) argues that if this is the case, it still does not explain why MNCs use FDI and not exporting.

Thirdly, there is the ownership advantage theory where MNCs are fully exploiting certain intrinsic competitive advantage that the local firms may not have (Kindleberger 1969; Caves 1982; Buckley and Casson 1976, and Dunning 1977). These advantages refer to certain technological advantages including superior production techniques, better management methods, brand name, reputation, benefits of economies of scope and scale, monopolistic advantage and ownership of scarce resources (Hill 2001). These factors are also known firm specific advantages.

Fourthly, there is the locational advantage argument provided by Dunning (1977) that explains the nature and direction of FDI based on certain locational factors. MNCs carry out their FDI due to certain locational factors inherent in the host market. These locational factors are further divided into demand factors and supply factors (Coskun 2001). The demand factors are large market, high domestic demand, openness of the economy, potential growth etc while the supply factors are cheap and skilled labour, infrastructure quality, government incentives, logistic cost, access to technology etc. The Multimedia Super Corridor (MSC) in Malaysia is an example of an area with certain locational specific advantages since it attracts concentration of information and technological companies that conduct research. These factors are also known as country specific advantages.

Then, there is the 'follow the competitor' theory advocated by Knickerbocker (1973). According to this theory, FDI flows are a reflection of strategic rivalry between firms in the global marketplace. Knickerbocker (1973) examined the relationship between FDI and rivalry in the oligopolistic market structure and found that there is a tendency for firms to follow the leader. In the service sector, this is evident when service firms internalise as a reaction to competing firms actions (Li 1994). Engwall and Wallenstal (1988) in their investigation of Swedish banks found that there is a tendency for them to follow the leader when competing in a foreign market. However, this behaviour was also found to exist in the study of manufacturing firms (Flowers 1977). However, Hill (2001) argues that this theory still does not explain why the leader decides to go abroad through FDI rather than exporting.

'Follow the client' theory is another theory that gathered momentum in the 80s and tried to explain the expansion of service based MNCs (Contractor, Kundu & Chun Hsu 2002). According to this theory, advertising, financial services and market research companies tend to follow their multinational-manufacturing clients abroad (Erramilli 1990; Erramilli & Rao 1993; Winsted and Patterson 1998; Hellman 1996; Li 1994). It seems that from the 1980s onwards, knowledge based service sectors tended to expand internationally using the 'follow the client' theory when they followed their multinational clients abroad (Contractor, Kundu & Chun Hsu 2002).

The most comprehensive framework that was eventually developed and used extensively until today is Dunning's Eclectic Paradigm (Dunning 1979, 1980,). He integrated the ownership, internalisation and locational advantages or factors to form a single conceptual framework known as the OLI (Ownership, Locational and Internalisation advantage) paradigm. According to this paradigm, FDI will take place if the ownership, internalisation and locational advantages are realised together.

EMPIRICAL PERSPECTIVES - FACTORS INFLUENCING FOREIGN DIRECT INVESTMENT

This section reviews the empirical studies that examine the factors influencing FDI over the years.

Locational factors (Country specific factors)

Market Size/Attractiveness

Market size or market attractiveness can be assessed or measured by examining host country's GDP, population, growth of GDP, GDP per capita, etc. Empirical evidence investigating market size and attractiveness in the host country as a variable influencing FDI has shown mixed results although most findings support the theoretical view that large markets attract FDI (Knickerbocker 1973; Dunning 1973; Woodward & Rolfe 1993; Narula & Wakelin n.d.; Venkataramany n.d.; Anand & Kogut 1997). Ajami & Ricks (1981) in their study of FDI in the United States (US) found the 'extremely large US market' as the most important determinant of FDI into the US. Coskun (1996) in his 1994 survey on manufacturing firms in Turkey found 'promising Turkish market' as the most important determinant of inward FDI (cited in Coskun 2001, p.223).

In the internationalisation of hotels, the size and rate of growth of the tourism sector in the host country was found to be an important determinant of FDI in the travel business (Dunning & McQueen 1981). Recent investigation by Chandraprapalert (2000), Mbekeani (1999), and Erdal & Tatoglu (2001) also found market size a

very important determinant of FDI. They found the size of domestic market to be positively related to FDI inflow.

In the banking industry, similar results were found. Grouse & Goldberg (1991) found a positive relationship between levels of foreign investment in banking with the size of the local banking sector. This means that a sizeable local financial sector can help to sustain a greater number of local and foreign banks. This result corroborated the findings by Focarelli & Pozzolo (2001) who also found that expected host country economic growth and development of its financial system as vital determinants of FDI.

Galan & Benito (2001) in their research on the determinants of FDI in manufacturing and service companies in Spain found that growing demand in the host market and large size of the market as important determinants of FDI. Why does market attractiveness enhance inward FDI? One explanation given is that profit rates are higher in attractive markets (Ramchander, Reichert & Jayanti 1999).

Malaysia is one of the fastest growing economies in the South East Asian region after Singapore. The service sector's share of GDP in Malaysia is currently close to 57% (Business Times, Tuesday Feb 3 2004). Therefore, Malaysia has the potential to attract FDI into the services sector. Most service MNCs are commercially present and are not export oriented. They cater and serve the growing domestic market. Therefore, this factor is likely to enhance future growth of service MNCs. Market size is therefore likely to be an important determinant influencing FDI into the services sector, currently and in the near future.

Workforce factors

Workforce factors refer to variables such as cost of labour-wages, education level, skill level etc. Empirical evidences that investigated these variables found mixed results. For example, Globerman & Shapiro (1999), Jenkins & Thomas (2002), Narula & Wakelin (n.d) & Kravis & Lipsey (1989) found in their empirical investigation that wages are negatively associated with FDI. Coskun's (1996) study of FDI in Turkey and Galan and Benito (2001) found that labor cost is only a moderate factor. Schneider and Frey (1985) in their study of FDI found that skill-level is more important than labour cost. Bagchi-Sen (1995) and Dunning (1989) found that real wage factor is more important for service MNCs compared to manufacturing MNCs.

In the case of FDI into China, most studies showed that the cost of labour is a significant factor (Broadma & Sun 1997; Kerr & Peter 2001 & Zhang & Pu Yuk 1998). However, for the pharmaceutical industry, low cost of labour was found to be less important in a study of FDI in China in 1992 (Jiang, Christodoulou & Chingwei 2001). According to the researchers, this industry is highly technological and capital intensive and as such, the demand for cheap labour is not so important.

In the Malaysian scenario, some service industries such as banking, insurance, information technology, telecommunication and BPO are capital and knowledge intensive. These industries depend on semi-skilled and educated labour. Malaysia is able to supply such workforce at relatively lower cost compared to established service economies such as Singapore. That is why, this sector still attracts substantial amount of FDI. Furthermore, there may be other factors such as availability of high quality English speaking, educated work force which is highly important in the services sector. A report by Bernama (2004), said that Shell's success in Malaysia was largely due to the availability of cheap, highly talented, highly trainable and capable Information Technology (IT) workforce. However, in certain services sector, such as the hypermarket retailing business, cost of manual labour may be more relevant since this sector employs unskilled workforce. So, whether cost of labour is an important determinant may depend on the type of service industries under consideration

Theoretically, for services, the degree of interaction between customers and producers is normally high and as such the quality of the company's human resources becomes a critical or key factor in their ability to deliver the service (Cardone & Cazorla 2001). The services sector is also known to be idiosyncratic where it is associated with high levels of professional skills, specialised know-how and customization (Erramilli & Rao 1993). Therefore, the availability of qualified local personnel is an important factor for service MNCs compared to manufacturing MNCs. This view was also found by research conducted by Bagchi-Sen (1995), Dunning (1989) and Schneider & Frey (1985).

Mbekeani (1999) in his research on FDI in South Africa also found that MNCs are attracted to invest in countries with low-cost educated and skilled labour. In the insurance industry, Donghui (2001) found that quality of human resources is an important determinant in the supply of competitive insurance services. In the hotel industry, Dunning & McQueen (1981) also found that the availability of good hotel staff as important determinant for internationalisation of hotels.

However, Tatoglu & Glaister (1998) in their research on FDI in Turkey found that qualified local labor supply in the services sector was only a moderate determinant or factor as compared to the manufacturing sector. This view was also supported by Ioannatos (n.d) in his research on demand determinants of FDI.

Malaysia has managed to develop its labour force over the years into a highly educated and semi-skilled workforce. This augurs well for the knowledge-intensive services sector such as banking and insurance, since this sector employs highly skilled workers. The services sector tends to employ highly educated and skilled workers. The availability of such workers in Malaysia at a lower cost compared to our competitor such as Singapore should be a motivating factor influencing FDI into the services sector. However, this factor may not be important in certain services sector such as hypermarket retailing business which is labour intensive and employs mostly unskilled worker.

Government factors

Variables that will come under government factors are government incentives, economic policies, political environment and government promotions towards FDI.

Theoretically, the tax regime is expected to have an inverse relationship with FDI (Kerr & Peter 2001). In other words, lower taxes promote FDI and vice versa. The same goes with the openness of an economy. It was found that the more open an economy, the higher FDI it attracts (Kerr & Peter 2001). Brewer (1993), Woodward & Rolfe (1993), Kerr & Peter (2001), Tung & Cho (2000) and He & Guisinger (1993) found that tax incentives had a positive effect on FDI. The degree of openness was also found to have positive impact on FDI in many studies (Balasubramanyam, Salisu & Sapsford 1996; Kerr & Peter 2001). Kravis and Lipsey (1982) also found the degree of openness as measured by the high propensity to trade as an important factor influencing FDI. These findings were corroborated by Wilhelms (1998), who also found economic openness to have positive impact on FDI. She also found high corporate tax to be negatively correlated with FDI.

However, there exists empirical evidence that do not support the above results. For example, Lim (1983) found that tax incentives do not affect FDI. Similarly, Wint & Williams (2002) and Wells & Wint (1990) also found that promotions by governments had negative impact on FDI. A study of FDI in the pharmaceutical industry in China, also found government incentives as not important determinants of FDI (Jiang, Christodoulou & Ching Wei 2001). Winsted & Patterson (1998) in their empirical investigation in the services sector found that incentives by government were not important determinants to exporters. One reason behind this is that most countries in the same line of business may have similar promotions.

The political environment refers to the laws and regulations passed by governments that can affect viability of MNCs operations in the host country (Griffin & Pustay 1999). Experienced international businesses usually engage in political risk assessment to evaluate the political risks they face in a particular host country (Griffin & Pustay 1999). Moran (1983) stated that political instability is only a small part of the overall risks faced by MNCs (cited in Beamish, 2000, p.201). However, Ajami and Ricks (1981) and Nigh (1985), both found that political stability has a positive influence on FDI.

For the services sector, openness of the economy or deregulation of the services industry is highly important. According to Bagchi –Sen (1995) & Dunning (1989), deregulation and liberalisation of the services industry is important for the future growth of the financial and telecommunications industry. Li & Guisinger (1992) in their empirical study found service MNCs investments in developed countries to be positively related to the openness of the host country. Another research in the insurance industry found regulative barriers by host government as the stumbling block discouraging FDI (Geracimous 1987, cited in Zimmerman 1999). In Malaysia, deregulation of the services sector such as banking and insurance would certainly attract FDI by foreign financial institutions. Established large foreign financial institutions that have presence all over the world would certainly benefit from this liberalisation since it provides them with an opportunity to strengthen their market share. Similarly, this may also be the case for foreign hypermarket retailers that have already dominated the local market extensively.

The Malaysian government has provided numerous incentives to attract FDI over the years. However, most of our competitors have also provided similar incentives. Vietnam, Thailand, Indonesia and Philippines have been successful in pulling FDIs away from Malaysia and Singapore by coming up with similar incentive packages (Lim 2002). So, it is worth examining whether tax incentives and government policies are significant factors in attracting FDI.

Another important development in Malaysia is the establishment of the Multimedia Super Corridor (MSC) in 1995. In fact, Malaysia was the first country in the region to create the MSC. The MSC has attracted world class MNCs both in the services sector and manufacturing sectors. Numerous incentives such as tax exemptions, provision of government grants, etc were provided to attract foreign firms especially in the information

technology field to set up their offices in the MSC. This gave Malaysia an edge to attract FDI although other countries in the region are also creating their own MSCs. However, the success of the MSC is yet to be seen since the level of investment flowing into the MSC is not substantial enough (Ramasamy n.d.) Therefore, providing tax incentives alone may not be sufficient to attract FDI.

Where the Malaysian services sector is concern, certain industries are still highly regulated such as the telecommunication and financial industry. However, the financial sector is set to open up in the near future but full liberalisation is only targeted in 2007. There have been complaints from foreign investors that the incentives given by the government are mostly for the manufacturing sector in Malaysia. Other important parts in the supply chain such as support services are however, neglected (Business Times, 29 March 2004). In fact, many of these MNCs that are doing business here have their regional headquarters and design centres in Singapore (Business Times, 29 March 2004). Singapore is still somehow the preferred location by MNCs when deciding to establish regional headquarters within this region, although the cost of doing business there is much higher.

The availability of a large educated multi - lingual workforce in Malaysia is already a strong motivating factor attracting huge number of foreign call centres to establish their operations here (Idris 2003). According to the Asian Call Centre Industry Benchmark Study in 2003, Malaysia has about 575 call centres and is placed at par with Singapore, Thailand and Hong Kong (The Star, BizWeek 4 October 2003 p.27). According to the American Chambers of Commerce (2004), many foreign companies find that they can service markets from India all the way down to Australia and up to Japan from a centre located in Cyberjaya, Malaysia. These foreign companies find that Malaysians have deep industry experience, good research skills and wide exposure, which should be very attractive for service MNCs.

Infrastructure

The level of infrastructure in the host country refers to the quality of roads, railroad, dependable energy and telecommunication availability, credit and banking facilities and other financial, legal and transport systems (Wilhelms 1998; Griffin & Pustay 1999). Here again, empirical results on the influence of infrastructure on FDI brought mixed results. Wilhelms (1998) in her econometric study found that institutional factors such as commercial energy are positively correlated with FDI. Cheng & Kwan (2000) also found that quality of infrastructure as a very important factor influencing FDI in China.
In the services sector, the level of infrastructure development was found to be a more important determinant of FDI by service MNCs compared to manufacturing MNCs (Bagchi-Sen 1995; Dunning 1989). Root & Ahmed (1978) in their empirical investigation also found that effective services sector in terms of adequate infrastructure in the area of banking, finance, insurance, telecommunication, transportation and distribution had positive impact on the ability of the host country to attract FDI. Dunning & McQueen (1981) in their study of the internationalisation of hotels found that general infrastructure for tourism as an important factor influencing internationalisation of hotels. However, moderate support was found by Tatoglu & Glaister (1998) on the importance of infrastructure development for services compared to manufacturing

Malaysia has one of the most developed infrastructures in this region after Singapore. It has developed high quality infrastructure in the financial, telecommunication and transportation sector. An efficient and developed infrastructure can reduce cost of doing business not only in the services sector but also manufacturing sector. Therefore, good quality infrastructure is necessary to lure FDI.

Since this research is examining FDI in services, it will emphasise only on the variables that are deemed to be more important for service MNCs. As such, variables such as market size, workforce factors, infrastructure and government factors may be more relevant to the Malaysian services sector. A more detailed description will be provided in the conceptual framework section.

Ownership factors (Firm specific factors)

A MNCs ownership advantages can also influence FDI. As discussed earlier in the theoretical literature, MNCs owning a valuable asset that creates a competitive advantage in the home country can use that advantage to venture into markets abroad (Griffin & Pustay 1999). The ownership advantages that will be discussed in this section are experience effects, firm expertise, reputation/brand image and size of the firm.

Experience effects

Davidson (1980) had shown that American MNCs proceed abroad gradually, where initially they go to familiar markets that are close. As soon as they gain more experience, they move on to unfamiliar markets that are

geographically distant. Davidson (1980) showed that experience had a positive effect on FDI. In the service industries such as advertising, Weinstein (1977) also observed experience effects influencing FDI. As advertising MNCs grew in size and obtained more experience, they started to penetrate into Europe and Latin America. Erramilli (1991) found that as service MNCs obtained more experience, they tended to choose markets that are culturally less similar to home country.

However, Li (1994) also investigated experience effects in ten service industries and found that this is important only in the early stage of internationalisation. He found that the relationship between international experience and new service FDI in the Asia Pacific Region to be non – monotonic. In other words, the above proposition may be defeasible. Empirical research by Alon & McKee (1999) on the internationalisation of professional business services found a positive relationship between intention to internationalise and age of the firm. In other words, older and more experienced firms tend to internationalise faster. Even in the internationalisation of hotels, the 'experience effect' was observed (Dunning & McQueen 1981). They found that large hotels that are more diversified and experienced could enter new markets easily since they enjoy economies of scale and have vast managerial and organisational expertise.

Firm expertise

Schroath & Korth (1989) in their research on FDI in the insurance industry found that intellectual property right is an ownership advantage that needs to be protected when expanding abroad. Donghui (2001), in his empirical investigation also showed that technology is a key determinant of the supply of insurance services by MNCs. Galan & Benito (2001) in their research on Spanish financial companies found that they stressed the importance of specific and intangible assets such as technology, innovative capability and managerial expertise as their ownership advantage. However, they found that economies of scale do not influence FDI of Spanish financial institutions. Narula & Wakelin (n.d) found that technological assets of US MNCs have positive influence on FDI.

Reputation

According to Tatoglu & Glaister (1998), ownership-specific advantages applicable to manufacturing firms are also applicable to service firms. For service MNCs, reputation and brand image are very important and are key competitive advantages (Von Der Ruhr 2000). In the internationalisation of hotels, Dunning & McQueen (1981) also observed that well-known reputation and brand image can guarantee quality of hotel services if that particular hotel is well known for its quality.

Size of firm

Lastly, Grunbaugh (1987) and Culem (1988) in their studies of manufacturing industries found that large firms are more likely than small firms to be foreign investors. Firm size was also found to show positive impact on the internationalisation of banks and advertising firms (Ball & Tschoegl 1982; Terpstra & Yu 1988; Weinstein 1977).

In the case of the Malaysian services sector, variables such as reputation, experience effect, brand image, size of the firm are considered to be important for MNCs. For example in the banking industry, some of the foreign banks in Malaysia such as HSBC and Standard Chartered have been here for more then a century and also have presence all over the world. Their reputation, experience and size may definitely give them an edge over new players in the industry. However, this may not be true for new and small service MNCs. For example, for small and new MNCs in the call centre industry, it will take time for them to establish themselves internationally. However, they may have certain managerial expertise that others do not have which gives them an edge over their rivals.

Similarly, in the software industry the ownership advantage may be in the form of an intellectual property right or technology. Therefore, foreign IT companies located in the MSC may depend on their intellectual property right to create a niche in the local market On the other hand, in the hypermarket retailing business; most of the MNCs are still new and have been here for less than ten years. So, it is yet to be seen if they depend on certain ownership advantage such as size or reputation to venture abroad or it's more due to locational advantage such as attractive domestic market.

Following clients into overseas markets

According to studies on internationalisation of service firms, in the initial stage, they tend to follow their manufacturing clients when they move abroad (Erramilli 1990; Erramilli & Rao 1993 and Winstead & Patterson

1998). This was also found to be evident in the banking and insurance sectors (Hellman 1996 & Li 1994). In Finland, Cardone et.al (2003) observed that small banks were found to follow their clients as they move abroad. In Spain, the same study showed that Spanish banks moved abroad according to 'follow-the-client pattern'. 'Follow-the-client' pattern was also evident in the internationalisation of Finnish and Spanish insurance companies. Similar results were also found by Galan & Benito (2001) in their investigation of 103 Spanish companies.

Weinstein (1977) in his investigation of advertising MNCs, found that they also tended to follow clients already there and sometimes the clients are the ones who request them to follow them. This motive has also been observed in other international banking and advertising studies (Goldberg & Saunders 1980; Nigh, Cho & Krishnan 1986; Terpstra & Yu 1988 and Li & Guisinger 1992). According to Li (1994), service MNCs prefer to service their existing clients from their own country. Studies of Nordic financial service companies all over the world also found similar client-following pattern (Engwall & Wallenstal 1988; Majkgard & Sharma 1998 & Sharma & Johanson 1987).

It can be argued whether this follow-the-client theory holds for all service MNCs. In the retail trade sector such as the hypermarket retailing business, the existence of foreign players in the local market is to capture the domestic market. In this type of business, the service MNC is selling its products directly to local customers and not foreign manufacturers. Therefore, the foreign retailer's motive is more for market-seeking purpose. Even in the banking industry in Malaysia, some of the foreign banks such as HSBC and Standard Chartered have been here for more than a century. HSBC's entry into Malaysia can be traced back to the early 1900s. HSBC, which was then known as HongKong Bank, not only served its foreign clients but also became a major foreign bank domestically, servicing local businesses as well. It also became a banker to most Asian governments including Malaysia. Therefore, there is a possibility that service MNCs may only initially follow their foreign clients abroad. However, as the local market opportunities start to increase, these service MNCs may eventually seek local clients as well.

Following competitors overseas

This 'follow-the-leader' behaviour can be traced back to the work of Knickerbocker (1973), Flowers (1977) and Graham (1978) in their study of FDI by manufacturing firms. This was also evident in the internationalisation of advertising MNCs (Weinstein 1977). He found that advertising MNCs tended to go abroad as a defensive strategy to follow their competitors. This was later reconfirmed by Terpstra & Yu (1988). Hamel & Prahalad (1985) through their empirical investigation found that service MNCs undertook FDI to protect their international market position from attacks by major competitors.
A study of Swedish banks revealed that they tended to follow each other to the same foreign market, often choosing the similar entry mode (Engwall & Wallenstal 1988). Li (1994) found that service firms internationalise as a reaction to a competing service firm's strategy. In Finland, there were indications that insurance companies and small banks internationalised using 'follow-the-competitor' pattern (Cardone et.al 2003).

In the hypermarket retailing business in Malaysia, there is a sudden increase in the number of MNCs investing here. These hypermarket retailers fall under the oligopolistic market structure (Carlo 2002). Therefore, there may be some possibility that they may confirm to the follow-the-leader pattern of expansion. However, according to a report by Asia Pulse, the entry of these foreign retailers into Malaysia may be mainly due to our long-term growth prospect and large market size (Asia Pulse, March 17, 2001). As such, these retailers are merely seeking new markets for their expansion. In the case of the banking and insurance industry, for time being until 2007, the financial sector is still highly regulated. So, it is difficult to ascertain if the existing foreign banks are expanding according to follow-the-leader pattern since their expansion is strictly controlled by the government.

Therefore, it is also the aim of this research to find out whether the selected service MNCs being examined behave according to these two theories.

CONCEPTUAL FRAMEWORK

This section will describe the conceptual framework – research model and the proposed hypothesis that is developed to study factors influencing FDI in the Malaysian services sector.
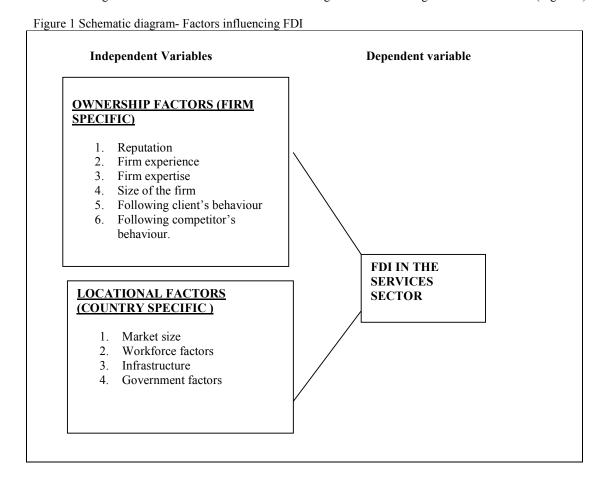
Conceptual framework-research model

Dunning's Eclectic Paradigm will be the main model used in this research due to its comprehensiveness (Dunning 1980, 1993). This theory is one of the most comprehensive frameworks developed and used extensively until today (Dunning 1980). Dunning (1980) introduced the locational advantage to address the issue of why firms go abroad to a particular destination, which the internalisation theory ignores. His locational advantage (L) was then integrated with ownership (O) and internalisation advantage (I) to form a single conceptual framework known as the OLI paradigm. According to this paradigm, FDI will take place when the ownership, internalisation and locational advantages are all realised together.

However, only the locational and ownership factors will be considered. The internalisation factor is not considered since service MNCs are already internalising operations once they are commercially present in Malaysia. Internalisation will be considered if the research intends to compare between FDI and other modes of internationalisation such as licensing, franchising etc. Based on the review of the literature in the previous section, only those locational and ownership factors that are relevant to FDI in the services sector are selected.

Thus, the locational factors selected are market size, workforce factors, government factors and infrastructure. The ownership factors selected are firm experience, reputation, firm expertise, size of the firm, following client's behaviour and following competitor's behaviour.

These locational and ownership factors will thus be the independent variables in this research. FDI in services is the main variable of interest in this study and is therefore the dependant variable. The relationship between the dependant variable, FDI, will therefore be explained by the independent variables described above. The schematic diagram of the theoretical framework examining factors influencing FDI is shown below (Figure 1).

Figure 1 Schematic diagram- Factors influencing FDI

HYPOTHESES DEVELOPMENT

Hypotheses are developed to examine the factors influencing FDI in the services sector. The locational factors selected in this research are basically country specific factors. Market size is likely to be an important factor

influencing most service sectors such as banking and insurance, retailing, transportation, telecommunication due to the positive outlook of the Malaysian economy over the years and in the future.

The availability of high quality workforce is also expected to influence FDI in certain services sector such as banking and insurance and call centre industries. A number of call centres have established their operations here in Malaysia due to this (Idris 2003). Availability of low-cost educated workforce is vital for the services sector since the degree of interaction between customers and producers is normally high. As such the quality of human resources becomes a critical or key factor in the ability of MNCs to deliver the services. A report in Bernama (2004), mentioned that availability of cheap and highly talented and trainable workforce is a key factor, why many foreign service firms are locating their base here. Many MNCs in the call centre industry are also establishing their Operational Headquarters (OHQs) in Malaysia (Business Times 26 Dec 2002).

Infrastructure is the third variable that is selected since it is deemed to be highly important in creating an efficient services sector. This is important for attracting FDI into sectors such as banking and insurance, transportation, telecommunication etc.

Government support is the fourth locational factor selected in this study. The Malaysian government has provided numerous incentives and developed positive economic policies to attract FDI over the years. However, the services sector is still highly regulated but is expected to further liberalise in the near future. Therefore, in the short run, the highly regulated services sector is discouraging FDI. In the case of tax incentives, numerous tax incentives in the form of tax relief and exemptions have been given to further attract foreign firms to establish their operations at the MSC. This factor is therefore, deemed to be important to attract FDI. In the line of this discussion, we therefore formulate the following hypothesis:

H1: There is positive relationship between market size and FDI in services
H2: There is positive relationship between workforce factors and FDI in services.
H3: There is positive relationship between infrastructure and FDI in services.
H4: There is positive relationship between government support and FDI in services

As for the ownership factors, one of the most important factor influencing FDI in services is brand image and reputation (Tatoglu & Glaister 1998; Von Der Ruhr 2000). The Malaysian services sector has attracted numerous well known service MNCs in various industries. Some examples include HSBC, Citi Bank, Standard Chartered, Allianz, DHL, Federal Express, TNT, etc. The ownership of well respected brand name and reputation is therefore expected to influence these MNCs to continue to expand internationally through FDI.

The second and third ownership factors influencing FDI in services are the size of the firm and firm experience. Large MNCs are more likely to have stronger competitive edge due to its ability to enjoy greater economies of scale. In the banking, insurance and transportation industries, it is common to see large MNCs in the services industry having presence all over the world. Service MNCs that have more experience are normally at a higher point of the learning curve, giving them more confidence to venture abroad. In the line of this discussion, the following hypotheses are elicited:

H5: There is positive relationship between firm's reputation and FDI in services.
H6: There is positive relationship between firm's experience and FDI in services.
H7: There is positive relationship between size of the firm and FDI in services.

Another important variable selected that is deemed to be important for service MNCs is firm expertise such as ownership of intellectual property right. This is normally a vital ownership advantage for information technology companies that develop software. These MNCs are likely to expand internationally through FDI to protect the ownership of their intellectual property right.

Other firm expertises are ownership of managerial, marketing and technological knowledge. Lately, Malaysia has become an attractive regional outsourcing hub for many service MNCs especially in the financial and telecommunication sector. Many of these service MNCs are likely to rely on their managerial, marketing and technological knowledge to remain competitive. Even, the foreign financial service firms use this ownership advantage to stay ahead internationally. Therefore, ownership of such factors can motivate foreign service firms to expand abroad.

FDI in Malaysia can be also explained by follow-the-client and follow-the leader (competitor) behaviour. Follow-the-client strategy has been a major motive of service MNCs to venture abroad and has been observed in the banking, insurance and advertising industry (Hellman 1996; Li 1994; Cardone et al. 2003; Galan & Benito 2001; Weinstein 1977; Goldberg & Saunders 1980; Nigh, Cho & Krishnan 1986; Terpstra & Yu 1988; Li &

Guisinger 1992)). Therefore, it is expected that FDI by service MNCs in Malaysia is also influenced by the existence of their home country clients here.

The follow-the-leader or oligopolistic reaction theory has been used to explain the behaviour or motive of service MNCs in 10 service industries such as insurance, reinsurance, securities, trading and retailing, accounting and advertising, construction, publishing and airlines (Li 1994). This pattern has also been observed by service MNCs in the advertising industry (Terpstra and Yu 1988). Therefore, it is expected that FDI by service MNCs in certain service industries in Malaysia that show oligopolistic characteristics, may follow this pattern. This leads us to the following hypotheses:

H8: There is positive relationship between firm expertise and FDI in services.
H9: FDI by selected service MNCs in Malaysia is likely to confirm to the follow-the- client behaviour
H10: FDI by selected service MNCs in Malaysia is likely to confirm to the follow-the- competitor behaviour

CONTRIBUTION OF THIS STUDY

This research is very unique in its own sense. It is investigating FDI in the services sector, an area where there is lack of research due to difficulties in obtaining secondary data. Most research on FDI tends to use secondary data and therefore is relying extensively on economic data such as Gross Domestic Product, Interest rates, Inflation rates etc. This research uses primary data and as such is able to collect and include a larger number of variables. It is also able to include certain variables that are difficult to quantify and not easily available such as reputation and multilingual and people skills (under workforce factors). This research intends to contribute enormously to the literature on FDI in services by uncovering and exploring in greater depth old and new variables.

Providing tax incentives and promotions may not be sufficient to attract FDI into the service sector. This is because other countries can provide similar tax packages and incentives Workforce factors such as availability of skill workforce, cost of labour and education level have been identified as highly important to attract FDI in previous research. However, this research has included new items such as multilingual workforce, people skills, multicultural workforce, English speaking low-cost educated workforce which may be more relevant to a country like Malaysia. In the services sector, there is a tendency to employ educated workforce and therefore cost of educated workforce may be a relevant factor. According to AT Kearney's Offshore Location Attractiveness Index 2004, Malaysia is placed third on the list for top outsourcing destinations for call centre services (The Edge Daily, 25th August 2004). This means that we are ahead of Singapore and other neighbouring countries in this region. So, the Malaysian workforce's unique characteristics are expected to be important determinants of attracting FDI into the services sector.

Similarly, the government factors do not only look at standard variables such as government policies, tax incentives etc. This research has included new items under government factors that are deemed to be more important such as transparency, special agencies to handle FDI, incentives to expatriate personnel, tax exemptions to service MNCs and new regulatory environment for service MNCs This research has also included reputation as an important factor influencing FDI into the services sector. It has been mentioned in the literature that reputation is a more important factor for service MNCs (Von Der Ruhr 2000).

The services sector itself is very unique due to its idiosyncratic characteristics (Boddewyn et.al 1986). As such service MNCs may have certain intangible characteristics and expertise that may be different. Due to this, these service MNCs may be able to differentiate and enhance their ownership advantage. This gives greater reason to further uncover such uniqueness.

The infrastructure factor has also included new items that are deemed to be more important to service MNCs in Malaysia. Apart from the standard infrastructure facilities that most governments create, Malaysia has developed special economic locations and created intelligent cities such as the MSC to further attract MNCs especially those in the ICT field. Those MNCs that are located in this economic zone are further provided with additional incentives.

The findings from this research will contribute to effective policy formulation. There is a need for the government to identify the motivational factors inducing service MNCs to invest in Malaysia. By doing so, the government can then introduce new incentives for attracting FDI into the service sector. Apart from general FDI incentives and promotions, there may be a need to introduce specific FDI incentives and promotions solely for the services sector. Even in the services industry, there may be a need to further introduce specific incentives for the different categories in the service sector.

Finally, the findings from this research can contribute further to the development of FDI theories in services, an area where research is currently lagging behind practice.

REFERENCES

Ajami, RA & Ricks, DA 1981, ' Motives of Non-American firms investing in the US', *Journal of International Business Studies*, Vol.12, No.3, pp.25-34.

Alon, I & McKee, DL 1999, ' The internationalisation of professional business service Franchises', *Journal of Consumer Marketing*, Vol.16, No. 1, pp. 74-85.

Anand, J & Kogut, B 1997, ' Technological capabilities of countries, firm rivalry and FDI', Journal of International Business studies, Vol.28, No.3, pp.445-467.

Baghchi-Sen, S 1995, ' FDI in US producer services: a temporal analysis of foreign direct investment in the finance, insurance and real estate sectors', *Regional Studies*, vol.29, No.2, pp.159-170.

Balasubramanyam, VN, Salisu, M & Sapsford, D 1996, ' Foreign fïrect investment and Growth in EP and IS countries', *Economic Journal*, 106, pp.92-105.

Ball, C & Tschoegl, A 1982, ' The decision to establish a foreign bank branch or subsidiary: an application of binary classification procedures', *The Journal of Financial and Quantitative analysis*, Vol.17, No.3, pp.411-424

Beamish, PW, Morrison, AJ, Rosenzweig, PM & Inkpen, AC 2000*, International Management: Text and Cases*, McGraw Hill, US.

Bernama, 2004, ' Shell owes huge success in Malaysia to local talents', available at www.mdc.com.my/today/html/2004-sstory_22.asp

Boddewyn, J.J, Halbrich, MB., & Perry, AC 1986, Service multinationals: conceptualisation, measurement and theory. *Journal of International Business Studies, 17*, 1-26.

Brewer, TL 1993, ' Government policies, market imperfections and FDI', *Journal of International Business Studies*, Vol.24, no.1, pp.101-121.

Broadman, RE & Sun, X 1997, ' The distribution of foreign direct investment in China', *The World Economy,* Vol. 20, No.3, pp. 339-362.

Buckley, PJ, & Casson MC 1976, *The Future of the Multinational Enterprise*, London, Macmillan.

Cardone-Riportella & Cazorla, L 2001,' The internationalisation process of Spanish banks: a tale of two times', *International Journal of Bank Marketing*, Vol.19, No.2, pp.53-67.

Cardone, C, Alvarez, MJ, Lado, N & Sasi, V 2003,' The relative effects of client-following and market seeking strategies in the internationalisation process of financial service companies: a comparison of Spanish and Finnish entities',*International Journal of Management*, Vol.20, No.3, pp.384-394.

Carlo, Morelli 2002, ' The determinants of growth in multiple retailing in Britain' *Dundee Discussion Paper in Economics*, No.132.

Caves, RE 1982*, Multinational Enterprise and Economic Analysis*, Cambridge, UK, Cambridge University press.

Chandprapalert A, 2000, 'The determinants of United States direct investment in Thailand: A survey on managerial perspective', *DBA thesis*, University of Sarasota, US.

Cheng, L. K., & Kwan, Y. K. (2000). What are the determinants of the location of foreign direct investment? The Chinese experience. *Journal of International Economics*, *51*, 379-400.

Contractor, FJ, Kundu, S & Chun Hsu 2002, C, 'A three stage theory of international expansion: The link between multinationality and performance in the service sector', *Journal of International Business Studies* (Forthcoming).

Coskun, R 2001, ' Determinants of direct foreign investment in Turkey', *European Business Review*, Vol.13, no.4, pp.221-227

Culem, CG 1988, ' The locational determinants of direct investments among industrialised countries', *European Economic Review,* 32, pp.885-904.

Davidson, WH 1980, ' The location of FDI activity: country characteristics and experience effects', *Journal of International Business Studies*, Vol.11, No.2, pp.9-22.

Donghui, L 2001, ' International insurance services', *PHD dissertation University of New South Wales, Australia.*

Dunning, JH 1973, ' The determinants of international production', *Oxford Economic Papers*, 25, pp.289-336

Dunning, JH 1977, *The Multinational Enterprise*, Allen & Unwin, London.

Dunning, JH 1980, 'Towards an eclectic theory of international production: some empirical tests', *Journal of International Business Studies*,Spring/Summer, 9-31.

Dunning, JH 1981, *Multinational Production and the Multinational Enterprise*, Allen & Unwin, London.

Dunning, JH & McQueen, M 1981, ' The Eclectic theory of international production: A case study of the international hotel industry', *Managerial and Decision Economics,* vol.2, No.4, pp.197.

Dunning, JH 1989, *Transnational Corporations and Growth of services: Some Conceptual and Theoretical Issues*, New York: United Nations.

Elfring, T 1989, 'New evidence on the expansion of service employment in advanced economies', *Review of income and wealth*, Series 35, No.4, December 1989.

Engwall, L & Wallenstal, M 1988,' in small steps: the internationalisation of Sweedish banks', *Journal of Management* vol.4, no.3. pp.147-55.

Erdal, F & Tatoglu, E 2001, ' Locational determinants of foreign direct investment in an emerging market economy: evidence from Turkey', *Multinational Business Review*, Vol.10, No.1, 2002.

Erramilli, MK 1990, ' Entry mode choice in service industries', *International Marketing Review*, Vol.7, no.5, pp.50-62.

Erramilli, MK 1991, ' The experience factor in foreign market entry behaviour of service firms', *Journal of International Business Studies*, 22, pp.479-502.

Erramilli, MK & Rao,CP 1993, ' Service Firms' international entry mode choice: A modified transaction –cost analysis approach', *Journal of Marketing,* Vol 57, pp. 19-38.

Elfring, T 1989, 'New evidence on the expansion of service employment in advanced economies', *Review of income and wealth*, Series 35, No.4, December 1989.

Flowers, EB 1977, ' Ologopolistic reactions in European and Canadian direct investments in the United States', *Journal of International Business Studies*, Vol.8, pp.43-49.

Focarelli, D & Pozzolo, AF 2001, ' The patterns of cross-border bank mergers and shareholdings in OECD countries', *Journal of Banking and Finance*, 25, pp.2305 -2337.

Galan, JI & Benito, JG 2001, ' Determinant factors of foreign direct investment: some empirical evidence', *European Business Review*, vol. 13, No.5, pp.269-278.

Globerman, S & Shapiro, DM 1999, 'The impact of government policies on FDI: the Canadian experience', *Journal of International Business Studies*, Vol.30.No.3, pp.513-532.

Goldberg, LG 7 Saunders, A 1980, 'The causes of US bank expansion overseas', *Journal of Money, Credit and Banking*, pp.630-643.

Graham, EM 1978, 'Transatlantic investment by Multinational Firms: a rivalistic Phenomenon', *Journal of Post-Keynesian Economics*,pp. 82-99.

Griffin, RW & Pustay, MW 1998, *International Business: A Managerial perspective*(2Ed), Addison Wesley, US.

Grosse, R & Goldberg, LG 1991, ' Foreign bank activity in the United states: an analysis by country of origin', *Journal of Banking and Finance*, 15, pp.1092-1112.

Gronroos, C 1999, 'Internationalization strategies for services', *Journal of Services Marketing, vol.13, No.4/5,pp.290-297.*

Grunbaugh, SG 1987, ' Determinants of foreign direct investment', *Review of Economics & Statistics,* Vol.69, No.1, pp.149-52.

Hamel, G & Prahalad, CK 1985, ' Do you really have a global strategy?', *Harvard Business Review*, pp.139-148.

He, X & Guisinger, S 1993, ' Taxation of US FDI abroad: effective tax rates and tax policy competition in developed and developing countries', *Journal of International Accounting, Auditing and Taxation*, Vol.2, No.2, pp.215-229.

Hellman, P 1996, ' The internationalisation of Finnish financial service companies', *International Business Review*, Vol.5, pp.191-208.

Hennart, JF 1982, *A Theory of Multinational Enterprise*, Ann Arbor: University of Michigan press.

Herrero, AG & Simon, DN 2003, ' Determinants and impact of financial sector FDI to emerging economies: a home country's perspective (1)', *Occasional Working Paper No. 0308*, Banco de Espana, Madrid.

Hill, CWL 2001*, International Business*, International Edition, 3rd edition, McGraw Hill, New York

Hymer, SH, 1976, *The International Operations of National Firms: A Study of Direct Foreign investment,* Cambridge, MA: MIT press.

Idris, I 2003, ' Malaysia seen as ideal hub for call centre ops', *The Star – StarBiz*, 19th August, p. 12.

Ioannatos, PE n.d., 'The demand determinants of Foreign Direct Investment: evidence from nonnested hypotheses.

Jenkins, C & Thomas, L 2002, ' FDI in Southern Africa: determinants, characteristics and implications for economic growth and poverty alleviation', Jiang, F, Christodoulou, C, Ching Wei, H 2001, ' The determinants of international pharmaceutical firms' FDI in China: a comparison between early (pre-1992) and late (from –1992) entrants', *Management Decision*, Vol.39, No.1, pp.45-56.

Johanson, J & Sharma, D 1987, 'Technical consultancy in internationalisation', *International Marketing Review*, Vol.14, Winter, pp.20-29.

Johnson, Dr & Creech, JC 1983. Ordinal measures in multiple indicator models: A simulation study of categorization error. *Americal Sociological Review,* 48, pp.398-407.

Kerr, IA & Peter, VM 2001, ' The determinants of FDI in China', *Proceedings of the 30th Annual Conference of Economists,* University of Western Perth, Australia

Kindleberger, CP 1969, *Amercan Business Abroad*, New Haven, CT: Yale University Press

Knickerbocker, FT 1973, *Oligopolistic Reaction and Multinational Enterprise,* Harvard University, Boston, MA.

Kravis, IB & Lipsey, RE 1982, ' The location of overseas production and production for exports by US multinational firms', *Journal of International Economics*, Vol.25, pp.201-23

Lacayo, M 2003, ' Study of FDI in manufacturing vs service industries: a Nicaraguan Perspective*, DBA Dissertation*, Nova Southeastern University

Larrain, FB, Luis, FL & Andres, RC 2001, ' Intel: A case study of foreign direct investment in Central America', in *Economic development in Central America: Growth and Internationalisation,* vol.1, Harvard University Press.

Lee, KP 2003, 'HSBC offers support to MNCs', *The Star – Starbiz*, 10th February, p.7.

Li, J 1994, ' Experience effects and international expansion: strategies of service MNCs in the Asia =Pacific region', *Management International Review*, Vol. 34, no.3, pp.217-234.

Li, J & Guisinger, S 1992, ' The globalisation of service multinationals in the Triad Regions: Japan, Western Europe & North America', Journal of International Business Studies, Vol.23, No.4, pp.675 –696.

Li, S, Wang, Y & Zhai, F 2003, 'Impact of service liberalization on employment and output: A CGE analysis' *Senior policy seminar paper on China's service sector in the post-WTO era, National Development and Reform commission & World Bank.*

Lim, D 1983, ' Fiscal incentives and direct foreign investment in less developed countries', *Journal of Development Studies*, pp.207-212.

Lim, T 2002,' Tax incentives to woo foreign direct investments', available online at http://www.pwc.com/Extweb/manissue.nsf/docid

Majkgard, A & Sharma, DD 1998, ' Client following and market seeking strategies in the internationalisation of service firms', *Journal of Business to Business Marketing*, vol.4, No.3, pp.1-41.

Mbekeani, KK 1999, 'Foreign direct investment and economic growth', available online at http://www.niep.org.za/resart23.htm

Mathews, J 2003, ' Focus on services', *The Star – Intech*, 11th Sept, p.25.Narula, R & Wakelin, K n.d., ' The pattern and determinants of US FDI in industrialised Countries',*MERIT Working Paper,* available online at http://meritbbs.unimaas.nl/tser.html.

Nathan, DM 2003, 'Malaysia woos FDI', *The Star, Bizweek*, 1 February, p.6. Nigh, D. 1985. The Effect of Political Events on United States Direct Foreign Investment: A Pooled Time-Series Cross-Sectional Analysis. Journal of International Business Studies vol :16, No: 1, pp.1-17.

Nigh, D, Cho, KK & Krishnan, S 1986, ' The role of location related factors in US banking involvement abroad : an empirical examination', *Journal of International Business Studies*, Vol.17, Fall, pp.59-72.

Ramasamy, B n.d, ' Foreign direct investment under uncertainty: lessons for Malaysia', available at www.econ.tu.ac.th/iccg/papers/bala.doc.

Ramchander, S, Reichert, A & Jayanti, SV 1999, 'Determinants of foreign banks involvement in US banking markets', *Journal of Managerial Finance*, Vol.25, No.7, pp.

Root, FR & Ahmed, AA 1978, ' The influence of policy instruments on manufacturing direct foreign investment in developing countries', *Journal of International*

Schneider, F & Frey, BS 1985, ' Economic and political determinants of FDI', *World Development,* 13, pp.161-175.

Schroath, FW & Korth, CM 1989, 'Managerial barriers to the internationalisation of US property and liability insurers: theory and perspectives', *Journal of Risk and Insurance*, vol.56, No.4, pp.630-648.

Tatoglu, E & Glaister, W 1998, 'Determinants of foreign direct investment in Turkey',Thunderbird International Business Review, vol.40, No.3, pp.279-314

Terpstra, V & Yu, CM 1988, ' Determinants of foreign investments of US advertising Agencies', *Journal of International Business studies,* Vol.19, Spring, pp.33-46.

Tung, S & Cho, S 2000, ' The impact of tax incentives on FDI in China', *Journal of International Accounting, Auditing and Taxation*, Vol.9, No.2, pp.105-135.

UNCTAD 2002, available at http://www.unctad.org

UNCTAD/WTO 2002, available at http://www.intracen.org/serviceexport/sehp_economic_contribution.htmUnited Nations 1978, Transnational Corporations in World Development: A Re-Examination, Commission on Transnational Corporations, New York, United Nations, May.

Venkataramany, S n.d , ' Determinants of FDI in India: an empirical analysis of source countries and target industries,

Vernon, R 1966, 'International investment and international trade in the product cycle', *Quartely Journal of Economics*, pp.190-207

Von Der Ruhr, MB 2000, ' Foreign direct investment in services', *PhD thesis*, IndianaUniversity, US.

Weinstein, AK 1977, ' Foreign investments by service firms: the case of multinational advertising agencies', *Journal of International Business Studies*, 8, 000001, pp.83-91.

Wells, LT Jr & Wint, AG 1990, ' Marketing a country: promotion as a tool for attracting foreign investment', *Occasional Paper 1*, International Finance Corporation, Washington DC.

Wilhelms, SKS 1998, ' Foreign direct investment and its determinants in emerging Economies', *African Economic Policy Paper-Discussion Paper,* No.9, available online at http://www.eagerproject.com/discussion/.shtml

Winsted, KF & Patterson PG 1998, ' Internationalisation of services: the service exporting decision', *Journal of Services Marketing,* Vol. 12, no.4 pp.294-311.

Wint, AG & Williams, DA 2002, ' Attracting FDI to developing countries: a changing role for government*', International Journal of Public sector Management*, Vol.15, No.5, pp.361-374.

Woodward, D. and R. Rolfe. 1993. The Location of Export-Oriented Foreign Direct Investment in the Caribbean Basin. *Journal of International Business Studies* 24(1): 121-144.

Zhang, X & Po Yuk, H 1998, ' Determinants of Hong Kong manufacturing investment in China: a survey', *Marketing Intelligence & Planning*, Vol.16, No.4, pp.260-267.

Zimmerman, A 1999, ' Impacts of services trade barriers: a study of the insurance industry', *Journal of Business & Industrial Marketing*, Vol.14, no.3, pp.211-228.

Testing Output-inflation Trade-off: A Note

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ABSTRACT

This study estimates the Asai (1999) proposed simplified BMR model (Ball *et al*., 1988) and ARY model (Akerlof *et al*., 1988) using quarterly data from Malaysia, Thailand, Japan and US. Unlike other earlier authors, we ensure that our models' residuals are free from serial correlation and ARCH effects. For the ARY model, all countries under study show strong evidence for new Keynesian model, with the exception of Japan, which produces inconclusive results. As for the BMR model, all countries provide strong evidence for new Keynesian model. Our finding implies that government generally plays a significant role in altering the economy's business cycle.

INTRODUCTION

Macroeconomists have long been debating on the issue of whether allowing the economy to operate freely under market force will be more successful in achieving macroeconomic goals than otherwise. Most related studies are conducted based on the new classical and new Keynesian hypotheses.

In the new classical hypothesis, market force functions well and government intervention should not exist because it is believed that: (a) inflation is more costly than unemployment; (b) short-run Phillips curve is quite steep; the economy's self-correcting mechanisms work smoothly and quickly. The new Keynesians, on the other hand, do not believe in market force and they argue that government intervention is important because: (a) unemployment is more costly than inflation; (b) short-run Philips curve is rather flat; (c) the economy's self-correcting mechanism is slow and unreliable.

The new classical economies and the real business cycle theory are based on the dual assumptions of rational expectations and continual market clearing. As a result, according to these theories, unemployment is voluntary, and anticipated money shocks have no real effects. Akerlof *et al*. (1988) comment that unlike the new classical theory, new Keynesian economics fits most important stylized facts of the business cycle: that cyclical unemployment is largely involuntary and that anticipated demand shocks do affect real output. To this end, empirical evidences suggest that no one hypothesis can dominate the other and the rally is still going on.

This paper attempts to provide empirical evidence on a new Keynesian theory of the output-inflation trade-off using the Asai (1999) proposed simplified versions of BMR model (Ball *et al*., 1988) and ARY model (Akerlof *et al*., 1988). Briefly, the interpretation of these two models is based solely on the *t*-statistics of the estimated coefficients. We note here that *t*-statistics are not relevance if the model's residuals exhibit autocorrelation or heteroscedasticity. However, from our literature survey, most of the earlier authors either do not do residuals tests or assuming at the outset the absence of serial correlation or ARCH effects (see example, Asai, 1999; Katsimbris and Miller, 1996; Ball *et al*., 1988 and Akerlof *et al*., 1988). Thus, the contribution of this paper to the current literature is to provide more reliable empirical evidence from models that are free from autocorrelation or heteroscedasticity effects. Specifically, unlike earlier papers, this study first conduct residuals diagnostic tests before proceed to the formal model estimation using non-linear least square method.

The rest of this paper is organised as follows: Section 2 reviews the related studies. This is followed by a description of the methodology used in this study. Section 4 presents the empirical results as well as the analysis of the findings. Finally, concluding remarks are given at the end of the paper.

REVIEWS ON RELATED STUDIES

The work of Lucas (1973) was the first to provide empirical evidence to the new classical hypothesis. Lucas (1973) model assumes that economy has a basic rational, maximizing firms and individuals, and that the market always clear. Lucas (1973) finds that there is a negative correlation between the output-inflation trade-off parameter and the variances of both nominal aggregate demand and the rate of inflation.

In an attempt to challenge the existing tests of the new classical model, Ball *et al*. (1998) develop a dynamic new Keynesian model to analyse the effects of menu costs on price adjustment. The model assumes an imperfectly competitive market in which firms control their own prices, subject to menu cost, with the objective of profit maximizing. It was believed that the real effects of a nominal shock depend on how often firms adjust their prices. The greater the speed of adjustment of individual prices, the smaller the real effects of a nominal shock, and thus the steeper the Phillips curve. The frequency of price adjustments depends on the variance of aggregate demand and the inflation rate. In particular, the higher the variance of aggregate demand, the more uncertain the firm's future optimal price is, and the shorter the firm's time interval between price changes. A negative correlation thus exits between the variance of aggregate demand and output-inflation trade-off, and between average rate of inflation and the output-inflation trade-off.

Ball *et al*. (1988) used a two-step procedure, employing a sample of 43 countries with annual data to: (1) estimate the standard Lucas aggregate supply curve by regressing real output on its own lagged value, the rate of change of nominal GNP, and a time trend over the 1948–86 period; (2) estimate cross-country linear and non-linear specifications of the estimated output-inflation trade-off coefficients (τ) on the average inflation rate and the variability of aggregate demand and/or the variability of the inflation rate; and (3) estimate time-series cross-section equations by regressing the change in the output-inflation trade-off coefficients between two sub-periods (i.e. 1948–72 and 1973–86) on the respective changes of the average rate of inflation and demand variability. Their results support a negative correlation between short-run output-inflation trade-off and the average inflation rate. Ball *et al*. (1988) conclude that strong evidence exists for new Keynesian model and, by implication, against the new classical model.

Akerlof *et al*. (1988), however, argue that given that average inflation rate and the variability of nominal GNP are highly correlated (correlation = 0.92), the test of Ball *et al*. (1988) is inevitably a weak test of their theory against the new classical theory, as well as other new Keynesian alternatives. They further argue that expected inflation and the volatility of nominal GNP growth have probably not been constant as assumed by Ball *et al*. (1988) in most countries in reality. As such the optimal interval between price changes would also have changed in each country over time. Consequently, the output-inflation trade-off coefficient (τ_t) must be allowed to vary over time. Akerlof *et al*. (1988) perform the same cross-country test employing a different non-linear specification (i.e. the inverse of trade-off coefficient) and find no evidence supporting the new Keynesian hypothesis. They conclude that aggregate data just do not seem to discriminate between the hypothesis of interest and very different alternatives.

Katsimbris and Miller (1996) re-examine the tests proposed by Ball *et al*. (1988) and Akerlof *et al*. (1988) using both pooled and country-by-country regressions. Their results show that autocorrelation could possibly lead to misspecification and thereby lead to conclusion in favour of the new Keynesian model. They find no evidence to support the new Keynesian hypothesis with the pooled data (39 countries altogether). Meanwhile, on a country-by-country basis, little evidence exists that is consistent with either the new Keynesian or the new classical models.

Asai (1999) also reconsider the empirical tests of Ball *et al*. (1988) and Akerlof *et al*. (1988) and they propose a simple and straightforward testing procedure for each model. They take into account of a unit root in real output and modelled time varying variance of inflation rate using generalized autoregressive conditional heteroscedasticity (GARCH) models. Their results for Canada, France, Germany, Italy, Japan and the US support the new Keynesian hypothesis.

METHODOLOGY

In this section, we provide a brief description of the methodology used in this study, which includes the Asai (1999) proposed models as well as the sample data.

The Model

We mirror the Asai (1999) proposed testing procedure to estimate our models, with minor deviations. After taking account for the existence of unit roots, Asai (1999) proposes to estimate the Lucas function by

$$y_t = \alpha + \tau_t \Delta x_t + \sum_{i=1}^{p+m} \lambda_i y_{t-i} + \gamma t + \mu_t, \, t = 1, \dots, T \tag{1}$$

where y is the log of real GDP, x is the log of nominal GDP, τ is the time varying trade-off coefficient, Δ denotes the differencing operator, p denotes the lag length, of which coefficient is significant, m is the number of unit roots in y (equivalently the order of integration), and T is the sample size.

According to Ball *et al*. (1988), the trade-off coefficient is related to inflation rate in the following manner:

$$\tau_t = a_1 + b_1 \pi_t + c_1 \sigma_t \tag{2}$$

where τ_t is the trade-off coefficient, π_t is the inflation rate and σ_t is the time-varying standard deviation of inflation.

In contrary, Akerlof *et al*. (1988) used the functional form

$$\frac{1}{\tau_t} = a_2 + b_2 \pi_t + c_2 \sigma_t \tag{3}$$

in place of Equation (2).

Thus the Asai's (1999) version of BMR model is

$$y_t = \alpha + (a_1 + b_1 \pi_t + c_1 \sigma_t) \Delta x_t + \sum_{i=1}^{p+m} \lambda_i y_{t-i} + \gamma t + \mu_t, \, t = 1, \dots, T \tag{4}$$

Following Katsimbris and Miller (1996) and Asai (1999), we assume that a significantly negative coefficient on the inflation term supports the new Keynesian model and that a significantly negative coefficient on the time varying standard deviation of inflation and insignificant negative coefficient of inflation support the new classical model.

Asai's (1999) version of ARY model is

$$y_t = \alpha + \frac{\Delta x_t}{a_2 + b_2 \pi_t + c_2 \sigma_t} + \sum_{i=1}^{p+m} \lambda_i y_{t-i} + \gamma t + \mu_t, \, t = 1, \dots, T \tag{5}$$

By the same token, we assume that a significantly positive coefficient on the inflation term supports the new Keynesian model and that a significantly positive coefficient on the time varying standard deviation of inflation and an insignificant positive coefficient of inflation support the new classical model.

In this study, we estimate equation (4) and equation (5) using quarterly observations of GDP, inflation rate and time varying standard deviation of inflation for Malaysia, Thailand, Japan and the US. Our estimation procedure deviates from that of Asai (1999) in the sense that we do not use GARCH to model σ_t. Nevertheless we do diagnostic tests to check whether our model's residuals are free of serial correlation and ARCH effect up to 4 lag-lengths. We include GARCH (1,1) effect test to check higher order ARCH effect. While it is known that Katsimbris and Miller (1996) and Asai (1999) adjusted for autocorrelation and GARCH effect respectively in modelling σ_t, it is unclear whether they have performed residuals diagnostic tests. Thus, one may query the viability of their results.

The Data

In this study, we estimate equation (4) and equation (5) using quarterly observations of nominal and real GDP, inflation rate and time varying standard deviation of inflation for Malaysia, Thailand, Japan and the US. All data are collected from International Monetary Fund's International Financial Statistics (IMF/IFS). As these observations are not all readily for use, we have to construct them.

Quarterly nominal GDP is constructed from first regressing the annual nominal GDP with annual money supply (M_3) and then substituting the quarterly money supply to the regression model to interpolate the needed GDP. The fourth quarter's values are set equal to the observed annual data (Bahmani-Oskooee, 1986). As the R^2 values of regression are around 99%, we assume that our estimated quarterly GDP are good enough to reflect the actual observations. Real GDP are obtained by deflating the nominal GDP with the CPI. Inflation rate is calculated from the CPI series using the standard definition. Time varying standard deviation is obtained by computing the standard deviation of the inflation rate taking into account of time factor. Upon transformations, our ultimate usable data starts from 1980:1 and ends at 2000:4.

RESULTS AND ANALYSIS

Before we proceed to the formal model estimation, we provide some statistical properties of the time series data used in this study. The logarithmic transformed nominal and real GDP series are first subjected to unit root test using the Phillips-Perron (PP) test. These results are summarised in Table 1. All series are stationary after first differencing, indicating that $m = 1$ for all countries.

Table 1: Unit Root Tests

Country	lag	y	lag	Δy	lag	x	lag	Δx
Malaysia	1	−2.574	1	−9.796*	1	−1.868	1	−9.523*
Thailand	4	−2.144	4	−9.783*	4	−2.144	3	−9.783*
Japan	1	0.287	1	−11.287*	1	1.292	3	−8.080*
US	4	−2.493	1	−8.234*	1	−2.494	4	−6.737*

Notes: * denotes significant at 1%.

The inflation over the business cycle for all countries is plotted in Figures 1 to 4. It is obvious from the figures that for most of the time real growth rate and inflation rate are negatively correlated.
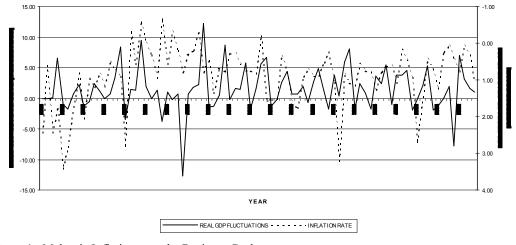
Figure 1: Malaysia Inflation over the Business Cycle
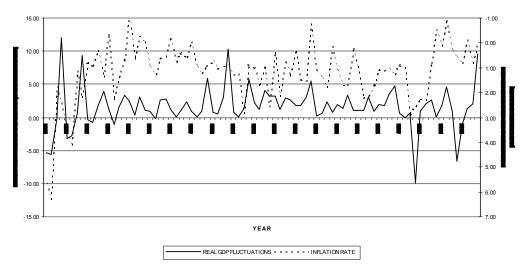
Figure 2: Thailand Inflation over the Business Cycle
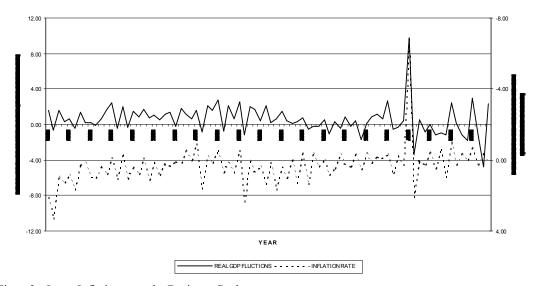
Figure3: Japan Inflation over the Business Cycle
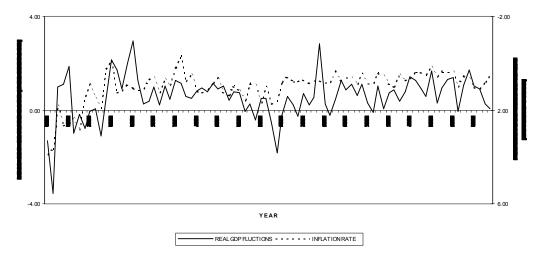
Figure 4: US Inflation over the Business Cycle

We then use the non-linear least square method in RATS program to estimate equation (4) and equation (5) and the results of estimation are reported in Table 2 and Table 3 respectively. For BMR model, all countries support the new Keynesian hypothesis. For ARY model, Malaysia, Thailand and US are supportive of new Keynesian hypothesis, whereas Japan shows inclusive results. The Lagrange Multiplier test for serial autocorrelation shows that all residuals are free from serial correlation problem up to 4 lag-lengths. Meanwhile the Lagrange Multiplier test for ARCH effect fails to detect any ARCH effect in all the residuals up to 4 lag-lengths or higher order. Since our results are obtained from models that are free from any autocorrelation or heteroscedasticity effects, our finding is more persuasive than previous studies.

Table 2: Results of BMR Model

Country	Lag[a] m	p	Estimated Coefficient[b] b_1	c_1	Diagnostic Test[c] LM (4)	ARCH (4)	GARCH (1,1)	R^2
Malaysia	1	1	−8.615 (−4.85)*	−0.717 (−0.06)	7.651 [0.11]	0.771 [0.94]	0.040 [0.98]	0.9997
Thailand	1	1	−15.439 (−5.80)*	9.542 (−1.63)	5.714 [0.22]	1.270 [0.87]	0.025 [0.99]	0.9998
Japan	1	1	−46.153 (−17.68)*	−32.862 (−1.86)	4.564 [0.38]	2.939 [0.57]	0.002 [0.99]	0.9993
US	1	1	−33.533 (−11.25)*	11.737 (0.80)	4.361 [0.36]	2.862 [0.58]	0.694 [0.71]	0.9997

Notes: [a] p is chosen such that no serial correlation remains in the residuals. [b] Coefficients as defined in Equation (4). t–statistic is given in parenthesis. * denotes significant at 5% or better. [c] Marginal significance value is given in square brackets.

Table 3: Results of ARY Model

Country	Lag[a] m	p	Estimated Coefficient[b] b_2	c_2	Diagnostic Test[c] LM (4)	ARCH (4)	GARCH (1,1)	R^2
Malaysia	1	2	6.124 (3.26)*	−4.531 (−0.31)	5.975 [0.20]	4.311 [0.37]	0.510 [0.77]	0.9997
Thailand	1	1	18.446 (8.86)*	−19.543 (−3.26)*	7.605 [0.11]	1.254 [0.87]	0.009 [0.99]	0.9998
Japan	1	3	14.333 (8.65)*	88.961 (2.51)*	3.701 [0.45]	2.256 [0.68]	0.017 [0.99]	0.9990
US	1	7	46.649 (12.14)*	10.695 (0.78)	5.020 [0.29]	3.166 [0.53]	0.521 [0.77]	0.9998

Notes: [a] p is chosen such that no serial correlation remains in the residuals. [b] Coefficients as defined in Equation (5). t–statistic is given in parentheses. * denotes significant at 5% or better. [c] Marginal significance value is given in square brackets.

CONCLUSIONS

We estimated the Asai (1999) proposed simplified BMR model and ARY model using quarterly data from Malaysia, Thailand, Japan and US. We take into the account of serial correlation and ARCH effect in the residuals terms. For the ARY model, Malaysia, Thailand and US show strong evidence for new Keynesian model, while Japan produces inconclusive results. As for the BMR model, all countries provide strong evidence for new Keynesian model. This finding implies that government generally plays a significant role in altering the economy business cycle. This is not surprising as most countries do manipulate their macroeconomics variables in order to maintain economic growth in certain range.

REFERENCES

Akerlof, G. A., Rose, A., & Yellen, J. (1988). The new Keynesian economics and the output-inflation trade-off: Comments and discussion. *Brookings Papers on Economic Activity*, *1*, 66-75.

Asai, M. (1999). Time series evidence on a new Keynesian theory of the output-inflation trade-off. *Applied Economics Letters*, *6*, 539-541.

Ball, L., Mankiw, N. G., & Romer, D. (1988). The new Keynesian economics and the output-inflation trade-off. *Brookings Papers on Economic Activity*, *1*, 1-65.

Katsimbris, G. M., & Miller, S. M. (1996). The new Keynesian economics and the output-inflation trade-off. *Applied Economics Letters*, *3*, 599-602.

Lucas, Jr., R. E. (1973). Some international evidence on output-inflation trade-off. *American Economic Review*, *63*, 326-334.

International Trade and Tourism in Malaysia: Evidence from Time Series Data

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ABSTRACT

Malaysia can be regarded as one of the main economy in South East Asia apart from Singapore in terms of trade and tourism. With the awareness that Malaysian government has on tourism over the years, this paper will seek to investigate the relationship between trade and tourism that might evolve in the process of development by using cointegration and causality tests. The research is conducted with quarterly data from 1981 to 2001 on international trade and tourism flows between Malaysia and it major trading partners namely ASEAN, Japan and United States. The results differ across countries and provide a strong support for a systematic relationship between tourism and trade and causality run both ways. The results provide an important implication for decision making on Malaysia's policy with regard to trade and tourism. This policy should specialize on both business and holiday/pleasure travel concentrating on recreational resorts and eco-tourism.

INTRODUCTION

Tourism is the composite product that enters into international trade flows as an invisible export item. It differs from other commodity exports in the sense that the consumer or the tourist has to consume the product in the exporting country. It usually faces fewer trading restrictions than other exports. Moreover, it has been argued that tourism generates more pecuniary as well as non-pecuniary benefits and costs than other export industries. Does travel industry follows the dictates of international trade theories? For example, the popular version of the 'Theory of Comparative Advantage' suggests that the differences in relative factor endowments serve as the main basis for international trade and a nation will have a comparative advantage in producing those goods or services in which it is abundantly endowed. Applying the theory, the countries that possess an abundance of underutilised labour and natural resources are likely to have a comparative advantage in exporting tourism services. While it applies to some countries (such as Indonesia, Thailand, and Carribean Islands), there are many exceptions. For example, tourism is a major industry in USA and Canada, a country that does not have cheap labour. Also in United Kingdom neither has abundant natural resources nor cheap labour, yet it is popular tourist destination. Malaysia, on the other hand, a nation characterized by labour abundance and virtually many natural resources available and still emerges as a premier tourist destination in South East Asia.

Comparative advantage is dynamic and changes over time as suggested by the well-known 'Product Cycle' theory. The concept has found numerous applications in tourism as experts studied the progression of a tourist attraction especially in resorts by applying stage-theoretic framework (for example, 'Tourist Area Life Cycle' theory). In an article by Toh, Khan and Ai-Jin Koh (2001), they proposed a new trade theoretic approach to study the relationship between the development stage of a country and the state of its tourism industry. The postulation is that less-developed countries would generally be closer to an 'introductory stage' or net exporters of tourism and the developed countries would be closer to a 'decline stage' or the net importers of tourism based on the travel balance which is define as net of travel exports over imports. While the prediction of the model is yet to be substantiated with data for larger number of countries, Toh, Khan and Ai-Jin Koh (2001) apply a different investigative technique to study the relationship between international trade and tourism.

Intuitively, one can argue that as a country makes economic advancement, most of its macroeconomics aggregates move upward and the movement of different variables such as merchandise trade and tourism services over time can perhaps establish more kind of a pattern or causality. Countries with higher trading volume are also likely to be more open economies and thereby leading a more developed tourism industries which accounts for a greater percentage of the country's GDP. Larger travel industry also leads to expansion of trade as the requirements for tourist commodities increase overall trade flows. At the same time, as friendship between countries evolves through trading of various goods and services, travel becomes more widespread. Kuledran and Wilson (2000) tried to investigate the trade-tourism nexus econometrically by using Australian data for her travel and tourism partner and it is the only published study in this area of tourism until date.

How can tourism influence international trade? If we concentrate on business travel alone (i.e. visitors who travel mainly for business purposes), the idea is pretty straightforward. Business visitors travel to a country for the purpose of buying certain products from that country for the purpose of buying certain products from that country or selling certain products to that country. Successful business trips therefore directly create a flow of exports and/or imports in subsequent periods. Such visits may also create a lot of positive externalities or indirect effect on both trade and tourism. Increased business travel may motivate others particularly friends and relatives of those who are involved in business to take holiday or pleasure trips to those destinations either alone or accompanied by business friends. Moreover, growing business transactions and dealings create interest among consumers about the products as well as source countries and these may subsequently lead to a surge in the flow of business/holiday visits to those countries.

Can other visitors apart from business visitors influence trade as well? The answer is 'YES'. International visitors, whether they go for visiting friend or relatives, studying overseas, medical treatment or purely for pleasure or holidaying, may identify business opportunities that could lead to either export sales or import purchases in subsequent period. Moreover, tourist may demand or consume certain types of products that are not produced in that country and therefore have to be imported and thus leading to a surge in import requirements for that that country. In open economies such as Malaysia and Singapore, tourists spend substantially on imported goods and services and thus contribute to import flows as well as total trade, though technically speaking, these constitute an outflow of tourist spending (import leakage) in those countries.

TOURISM IN MALAYSIA

Tourism is one of the fastest growing industries in Malaysia. Growing at average annual rate of 30% per in the past two decades, visitors arrival reached a record high 6.5 million in 1995. Double-digit growths were recorded in the early 1990's due to the aggressive advertisement by the Malaysian Tourism Board (MTB). However, the rise in visitor arrivals became relatively slower in the late 1990's. The visitation rate suffered major setbacks in 1991 where it rose by a mere 2.1% due to Gulf War and the worst disaster came in 1997 and 1998 where arrival rate declined by almost 8.9% and 20.5% when the region was hit by an Asian Crisis which crippled the whole region economically. It is however heartening to see that the tourism industry recovered very quickly and by the year 2001, the visitor arrivals again exceeded 5 million. Then came September 11 incident where tourist arrival especially from Europe and the United States decline dramatically and but it has been compensated with an increase of 32.2% tourist from Middle East and thus Malaysia does not suffer as much as in other countries in the region. It is due to the tough stance by the Malaysia Government against any form of terrorism.

Tourist is Malaysia are predominantly drawn from Asia especially from Middle East and the ASEAN especially from Singapore, Thailand, Indonesia and Brunei which represents the top tourist market that has been supplying more than 50% of total visitors to Malaysia. Other major tourist market for Malaysia includes Japan, Australia, Taiwan, UK, USA, China and India. Most of the tourist that came here are mainly for pleasure since Malaysia has a sufficient fund of natural attractions and recreational facilities. The so-called pure holidaymakers constitute the bulk of tourists coming to Malaysia which is nearly 60% of the total arrival. The proportion of business travellers currently hovers around 15% of the total tourist arrival in Malaysia.

Tourism contributes more than RM 9.2 billion to Malaysia's economy, accounting for roughly 25% of total GDP which includes tourism's multiplier effects on other sectors. In the balance of payments accounts, the size of the travel balance has been growing over the years although the rate growth has slowed down in the early 1990's when the travel industry seemingly matured. Travel credit or receipts earned from foreign visitors was RM 12,321.3 million in 1996 and rose to RM 21,291.1 million in 1997. But it has been badly affected by the economics crisis evident by a sharp fall in the travel receipts in 1997 and 1998 but still managed to record a good receipts in 2002 and 2003. Travel debit, or expenditure of domestic residents overseas, sees the same trend as for travel credits. Most of the Malaysian during the crisis prefers to stay inside the country rather than to take vacation abroad, mostly due the fact of higher depreciation of Ringgit. But nevertheless, the overall trade balance is increasing overtime since most of the Malaysian prefers to travel domestically rather than overseas.

Malaysia is an open economy and the reliance on trade and its importance in generating income can be seen from its increasing ratios of import per GDP and export per GDP over the years. The former was around 40% in the 1960 but it shoots up to more than 200% in the 1980 before settling around 150% in early 1990s. Currently, it hovers around 100% mostly due to the economics crisis in 1997 and 1999, but it gradually stabilising to 150% marks in 2003. The latter was also above 100% throughout year and it currently stood at 103%. Total trade of Malaysia in 2003 was more than 150% of its real GDP and the country's major trading partners included countries such as USA, Singapore, Japan, Hong Kong, Indonesia, Thailand, Taiwan, UK and Australia. Not unlike tourist arrivals and receipts, exports and imports figures also suffered setbacks in the mid-1980s due to economics depression, Gulf War in 1991 and Asian financial crisis in 1997-1998. The rebound in trade after

each fall was however quite swift and strong due to capital control measures adopted by the government. The overall pattern displayed by trade and tourism data provides some support for a long-term relationship between the two but such relationship can only be established by undertaking appropriate econometric studies.

METHODS AND DATA

This paper seeks to investigate the long-term relationship between international trade and tourism flows between Malaysia and its major trade and tourism partner. A battery of cointegration and causality test are used to analyse bilaterally the trade and tourism data for Malaysia and her partners, namely ASEAN, Japan, Australia, UK and USA. First, Unit Root tests are conducted to verify the stationarity properties of the time series with the absence of trend and long-run mean reversion as to avoid spurious regressions. A series of is said to be integrated of order *d*, denoted by I(*d*), if it has to be differenced *d* times before it becomes stationary. If a series, by itself, is stationary in levels without having to be first differenced, then it is said to be I(0). A standard Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF), Phillip-Perron (PP) tests (Dickey & Fuller, 1981; Phillips and Perron, 1988), and McKinnon (McKinnon, 1991) critical values will be used for that purpose. Second, for appropriate lag length, the VAR process in conjunction with Aikake Information Criteria is used. Third, the cointegration test are applied to detect the presence of any long-term relationship between variables, For two series to be cointegrated, both need to be integrated of the same order, 1 or above. If both series are stationary or integrated of order zero, there is no need to proceed with cointegrations since standard time series analysis would then be applicable. If both series are integrated of different order, it is possible to conclude non-integration. Lack of integration implies no long-run equilibrium among the variables such that they can wander from each other randomly. Their relationship is thus spurious. For *k* endogenous variables, each of which has one root, there will be 0 to *k-1* cointegrating relationship by using the Residual Based approach proposed by Engle and Granger (1987) and the Maximum Livelihood developed by Johansen and Juselius (1990). Finally, the causality amongst the variables is studied by applying the statistical concept of Granger Causality which does not imply any cause-and-effect relationship in a philosophical sense. It refers strictly to the concept of predictability (Granger 1969,1980,1981), meaning that a variable X enables better predictions to be made for Y, *ceteris paribus*. Vector Error Correction (VEC) models were estimated to infer the number of lag terms required to obtain the best fitting model and appropriate lag lengths were then used in causality tests yielding the F-statistics and respective p-values. For any F-statistic, the null hypothesis is rejected when the p-value is significant (i.e. less than 5% level of significance or otherwise). A rejection of the null hypothesis would imply that the first series Granger-causes the second series and vice versa.

The time series include quarterly exports, imports and total trade data on real tens for the period 1990 to 2003 (50 observations) while the data on travel which comprise of total travel, holiday and business travel covers a period of 1987 to 2003 with 88 observations. The choice of data period was mainly motivated by the availability of quarterly data for Malaysia's main trade as well as travel and business partner. Tourism data were obtained from Malaysia Tourism Board (LPM), Immigration Department of Malaysia and Custom Department of Malaysia while the trade data were procured from National Statistic Department and International Financial Statistic (IFS) database. All trade data were converted to real terms and for conversion of aggregate figures (i.e. total exports and imports), a respective export and import indices are used. For regional and country figures, conversion was made by using respective consumer price indexes in absence of export and import indices. All data were seasonally adjusted and logarithmic transformations were made before applying the statistical procedures.

EMPIRICAL RESULTS

Pairwise analyses were made for travel and trade series and their components which is business and holiday arrivals for the former and export and imports for the latter. All tests were carried out for five data sets (Total Trade Malaysia, ASEAN, Australia, UK and USA) reflecting Malaysia's tourism and trade data at aggregate and selected regional or country levels. The selected regional and/or country represent main trade partners. Table 1 shows the results of unit root test (both DF and ADF) and it is clear that all series are integrated of order 1 or I(0) except for Malaysia's real export to Japan and her real imports from Australia and USA. It should be noted here that the DF test is not valid when serial correlation is present in this model. The ADF test for a unit root extends the DF test to allow for richer dynamics in the data generation process when the variable is serially correlated. The lag length of ADF test was left unconstrained to give sufficient degree of freedom so as to allow the error term of the test equation to be serially uncorrelated. For further evidence on order of integration, Phillips-Perron (PP) tests is conducted and the results were virtually identical. The only exception was the real import series for ASEAN that was found to be I(0) by this new test.

Table 1: Summary of Order of Integration

	Total Trade	ASEAN	Australia	UK	USA
Total Arrivals	*I(1)*	*I(1)*	*I(1)*	*I(1)*	*I(1)*
Holiday Arrivals	*I(1)*	*I(1)*	*I(1)*	*I(1)*	*I(1)*
Business Arrival	*I(1)*	*I(1)*	*I(1)*	*I(1)*	*I(1)*
Real Total Trade	*I(1)*	*I(1)*	*I(1)*	*I(1)*	*I(1)*
Real Imports	*I(1)*	*I(1)*	*I(0)*	*I(1)*	*I(0)*
Real Exports	*I(1)*	*I(1)*	*I(1)*	*I(1)*	*I(1)*

Cointegration tests by using both residual and maximum likelihood methods were then conducted for data series of same order of integration and the results are displayed in Table 2. Altogether, as many as 13 pairs of cointegrating series were discovered 4 cointegration each for Australia and USA, and 3 for aggregate total trade series for Malaysia and 2 for United Kingdom. It was quite surprising that no long-term systematic relation was found to exist between Malaysia's trade and tourism with ASEAN. The volatility in the data seems to have marred the possibility of any regular co-movements in the two series. The region currently accounts for more than 40% of Malaysia's arrival and about 45% of the country's trade.

However, systematic relationships seemingly exist between Malaysia's other partner in trade such as United States, Australia and United Kingdom. Another interesting pattern discovered by cointegration tests is that it is holiday travel rather than business travel that is intimately connected with trade and its components. Only 2 out of 13 cointegrating series involved business travel and the rest were either for holiday or total arrivals with clear preferences on holiday travel in defined relationship.

In order to study the causal implication as well as direction of cointegrating series, the causality tests are run for all the series. Since the causality can also be implied by non-cointegrating series, it is therefore being included in the causality test and it done in the sense of Granger Causality Test and the result is summarised in Table 3.

Table 2: Summary of Cointegration Results

Relationship	Category
Total Travel ↔ Total Imports	Total for Malaysia
Total Business Trace ↔ Total Imports	Total for Malaysia
Total Holiday Travel ↔ Total Imports	Total for Malaysia
Total Trade ↔ Holiday Travel	Malaysia and Australia
Exports ↔ Total Travel	Malaysia and Australia
Exports ↔ Holiday Travel	Malaysia and Australia
Business Travel ↔ Imports	Malaysia and Australia
Total Travel ↔ Exports	Malaysia and UK
Holiday Travel ↔ Imports	Malaysia and UK
Total Travel ↔ Total Trade	Malaysia and USA
Total Travel ↔ Imports	Malaysia and USA
Holiday Travel ↔ Imports	Malaysia and USA
Total Trade ↔ Holiday Travel	Malaysia and USA

It is evident that most cointegrating series also display causal relationship which is highlighted by bold prints in Table 3. The vast majority of the causal connections are only one-way. Again, from the result, we can see overwhelming evidence of systematic relationship between business travel and trade as well as its component. The causality can run both ways, for example, imports to holiday travels and holiday travel to imports in the case of aggregate data of Malaysia, and from trade to travel and travel to trade and from travel to imports and imports to travel in the case of USA data. It mush be emphasised that US represents Malaysia's most stable trade as well as travel partner and the American visitors over the years have generated a significant trade flows between two countries and at the same time growing trade between two nations have also led to a surge in visitors arrivals in the city in Malaysia.

While the results reconfirm the close link between Malaysia and US, they also show the importance of Malaysia's other travel market such as Australia and United Kingdom in creating useful trade linkages. Although cointegration results failed to establish any long-term relationship between Malaysia's travel and tourism in ASEAN region, the causality test discover a few weak causal connection, which at around 10% significant level, mainly looking at total travel causes imports, holiday travel causes total trade, holiday travel causes imports and business travel causes exports.

Table 3: Summary of Causality Test Results

Category	Identified Granger Causality Relationship	Sig. Level
Total for Malaysia	Total Travel → Total Trade	10%
	Total Trade → Total Travel	10%
	Total Travel → Total Imports	1%
	Total Travel → Total Exports	10%
	Holiday Travel → Total Trade	10%
	Holiday Travel → Total Import	1%
	Holiday Travel → Total Exports	5%
	Total Trade → Business Travel	1%
	Total Imports → Holiday Travel	5%
	Business Travel → Total Imports	10%
	Total Exports → Business Travel	5%
Malaysia and ASEAN	Total Travel → Imports	10%
	Holiday Travel → Total Trade	10%
	Holiday Travel → Imports	5%
	Business Travel → Exports	10%
Malaysia and Australia	Total Trade → Total Travel	5%
	Total Travel → Imports	1%
	Holiday Travel → Total Travel	1%
	Business Travel → Total Trade	1%
	Holiday Travel → Imports	1%
	Business Travel → Exports	1%
Malaysia and USA	Total Travel → Total Trade	5%
	Total Trade → Total Travel	5%
	Total Travel → Imports	5%
	Imports → Total Travel	10%
	Holiday Travel → Imports	5%
Malaysia and UK	Total Travel → Total Trade	10%
	Exports → Total Travel	10%
	Total Travel → Exports	5%
	Holiday Travel → Total Trade	10%
	Business Travel → Imports	5%
	Holiday Travel → Exports	10%
	Total Trade → Business Travel	5%
	Imports → Business Travel	1%
	Exports → Business Travel	1%

CONCLUSION

Although the result tend to differ across trading and travel partner, the study provides strong support that there is a long term relationship between holiday travel in Malaysia and total trade and the causality between trade and travel may run both ways, holiday arrivals influence trade and vice versa. Business travel, although has a few significant causation on total trade, is found to be rather important but not as important as holiday travel as the relation to trade is concern. The results seem to have important policy implication for Malaysia, which has always been adopting an open-door policy with regards to tourism and trade. The main focus of Malaysia's tourism policy in the future and it should be shifted on to generation of more tourism-related businesses and facilities which are relatively higher value added. It should also increasingly turn its attention to emerging meeting, incentives, conferences and exhibition market by developing more of its convention facilities as well as increasing the awareness of eco-tourism towards tourist from the main trading partners. Although there is a suggestion that tourism in the region should be promoted as a specialization, it is not profitable to Malaysia. Since Malaysia has the facilities in both business and holiday businesses, it should concentrate on area but the concentration should be more on the recreational resort and eco-tourism facilities.

The study suffers from standard limitations that apply to any empirical exercise. The results are highly sensitive to data period selected, the size of sample, the quality of data, type of cointegration and causality tests and the omitted variables. All inferences drawn from statistical results should therefore be viewed with caution. Notwithstanding the limitations, the study makes a useful contribution to the understanding of linkages between trade and tourism.

REFERENCES

Bank Negara Malaysia, *Quarterly Bulletin*, various issues, Kuala Lumpur

Dickey, D.A & W.A. Fuller (1981), Likelihood Ratio Statistic for Autoregressive Time Series with Unit Root, *Econometrica,* 49, pp 1057-1072

Engle, R.F. & Granger, C.W.J (1987), Cointegration and Error Correction Representation, Estimation and Testing, *Econometrica*, 66, pp 251-276

Granger, C.W.J (1969), Investigating Causal Relations by Econometric Methods and Cross Spectral Methods, *Econometrica*, 2, pp 424-438

Granger, C.W.J (1980), Testing for Causality: A Personal Viewpoint, *Journal of Economic Dynamics and Control*, 2, 329-352

Granger, C.W.J (1981), Some Properties of Time Series Data and their Use in Econometric Model Specification, *Journal of Econometrics*, 16, 121-130

Johansen, S. and Juselius, K (1990), *Some Structural Hypotheses in a Multivariate Cointegration Analysis of Purchasing Power Parity and the Uncovered Interest Parity for UK*, Denmark: University of Copenhagen

Kulendran, N and K. Wilson (2000), Is there a relationship between international trade and international travel?, *Applied Economics*, 32, 1001-1009

Lim. C (1997), Review of International Tourism Demand Models, *Annals Tourism Resource*, 24(4), 835-849

Malaysia Department of Statistics, *Statistic Handbook,* Kuala Lumpur, 2003

Phillips, P.C.B & Perron, P. (1988), Testing for a Unit Root in Time Series Regression, *Biometrika*, 75, 335-346

Toh, Rex S., H. Khan and Ai-Jin Koh (2001), A Travel Balance Approach for Examining Tourism Area Life Cycle: The Case of Singapore, *Journal of Travel Research*, 39, pp 426-432

Joint Purchase Decision on Vacation (specialty product) by Spouses:
The Impact of Cohesion and Power-Based Families

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ABSTRACT

The majority of family decision-making studies have operationally viewed family decision making as being one of three categories: husband-dominant, wife-dominant, or joint decision between husband and wife. Although a number of studies have recognized joint decision between husband and wife, none of these has considered the impact of family structure on joint decision between spouses. In this research, a field survey of 103 couples in Kota Kinabalu, Malaysia, was conducted to understand the impact of family typing namely, strong vs weak cohesive family and modern vs traditional family on joint purchase decision on vacation (a specialty product) by Malaysian spouses, as well as the moderation effect of joint product usage. The results show that strong cohesive families make more joint decision on vacation than weak cohesive families. Modern families make more joint decision on vacation than traditional families. Joint usage does not moderate the relationship between family structure and joint purchase decision.

INTRODUCTION

Two structural dimensions are often used to describe the type of family - power and cohesion (Holdert, & Antonides 1997). Holdert and Antonides classify family into traditional and modern, based on power, and into weakly and strong cohesive families based on cohesion. These family types often determine how purchase decisions are made, for example, whether by the husband, or the wife, or both. While the concept of consumer socialization has been well researched, the integration of this concept into the family decision framework particularly understanding the role of family structure has been neglected and may provide additional insight into this phenomenon. This information is vitally important for marketers targeting families, in designing effective promotional and selling strategies. It is the aim of this study therefore, to examine the influences of these family types namely, strong and weak cohesive families as well as traditional and modern families, on joint purchase decision of Malaysia spouses on vacation. Vacation has been identified in the literature as jointly decided by spouses.

LITERATURE

Murdock (1949) proposed that family had four essential functions: (1) socialization, (2) economic cooperation, (3) reproduction, and (4) sexual relations. Among these functions, Reiss (1965) found that socialization is the most prevalent function in the nuclear family. For the purpose of this study, family is defined as "a group of two persons or more related by blood, marriage, or adoption and residing together" (U.S. Census Bureau 1978). This definition is suitable for the current research in that it describes membership of the family structurally rather than functionally. The family is considered as an important decision-making unit, due to the large quantity of products and services that form part of the everyday life of a household. According to Cox (1975), the individual members who make up the family unit exercise an influence over each other's behaviour and, therefore, over the activities which form part of consumer decision-making.

The structure of the family consists of the long-term properties of the relationship between family members. Family dynamics consists of the interactions between family members (Kirchler, 1989). Several authors have attempted to describe families by means of specific variables. For instance, Olson et al. (1989) distinguished cohesion, the ability to adapt, and communication style. Fitzpatrick (1984) described autonomy versus interdependence, conflict-involvement versus conflict-avoidance, and convention versus tradition. Kirchler (1989) argued that in order to comprise all these factors, two underlying structural dimensions could be distinguished: power and cohesion.

In the literature, there is no single definition of power. However, there is agreement about the difference between potential power and power actually exerted, called influence (Corfman & Lehmann, 1987). Potential power is the ability of a person to change the attitudes, opinions or behaviour of other people. Influence is the consequence of the active or passive exercise of power. In a relationship, the division of power has been described as traditional versus modern, considered to be a continuum. The distribution of power in the relationship affects the way decisions are made.

According to Ferber (1973), the responsibility of the husband in traditional relationship is earning the money whereas the wife is responsible for the housekeeping and childcare. Davis (1976) claims the existence of large authority difference in traditional relationships. This may frequently take the form of a hierarchical structure. According to Hagenaars and Wunderink-Van Veen (1990) a strictly hierarchical family has a patriarchal structure where the husband and father are considered the head of the family. Kirchler (1989) states that many decisions in a traditional relationship are taken autonomously by one of the spouses. Also, in traditional families coalition formation is likely, as the 'weak' partner will try to find support from other family members. Modern relationships are characterized by a high degree of joint participation in carrying out tasks and taking decisions (Davis, 1976). Hagenaars and Wunderink- Van Veen (1990) state that husband and wife have equal influence in a modern relationship. Also, the power distance between parents and children is shorter in modern than in traditional families. Kirchler (1989) states that in egalitarian relationships, spouses decide much less by role-segregation than in traditional relationships. However, both spouses wish to fulfil their individual desires. As a consequence, many decisions are made together but conflicts arise due to different opinions.

The second underlying structural dimension is cohesion, which is considered a continuous dimension. Cohesion is indicated by the degree of harmony in a family, the degree of interest in each other and the coalition dynamics. In general, cohesion includes the (degree of) emotional bonds between family members. Research has shown that a higher degree of cohesion is associated with a more harmonious family life and less egoistic decision making by the family members (Kirchler, 1989). Table 1 characterizes the different family types.

Table 1: Classification of Family Types

Traditional type	Strong, traditional role-differentiation
	Autonomic decision-making
	Coalition formation
Modern type	Equal division of power between partners.
	Short power distance between parents and children
	Joint decision-making
Weakly cohesive type	Low interdependence
	Disharmony
	Egoistic, individually driven
Strong cohesive type	Strong interdependence
	Harmony
	Altruistic, consideration for others

Source: Holdert and Antonides (1997)

MALAYSIAN FAMILY STRUCTURE

Kling (1996) reports that Malaysia is an example of a culture with strong sibling obligations. The father is empowered to protect and look after his domestic family. Kling (1996) reports that the study of Malay family and its ideology has to start with an understanding of the interlinkages of three basic foundations: the traditional sociocultural configuration which is internally understood as "adat", the impact and accommodation of Islamic religious principles and the influence of British colonial legislative laws. Compounding three major influences is the current direct exposure of family members, especially the younger generation, to foreign familial interaction pattern as portrayed, rightly or otherwise, by the mass media. The electronic media, especially, brought in an alternative structure of interaction in a pattern of family socialisation for the younger generation and create a sort of structural gap in the situation of family life.

Among the Chinese community, the pattern of obligations is closer to that found in China than to Malay traditions. The oldest sibling has the greatest responsibility by right. Michael and Diana (2003) examine some of the cultural and psychological assumptions of the Malaysian-Chinese people, in particular how their collectivist outlook affects emotional display, manners, family relations, work, wealth and spirituality. The Malaysian-Chinese culture is collectivist rather than individualistic (Markus & Kitayama, 1991; Lu, Gilmour, & Kao, 2001). Since the path to survival is through co-operation with others, the group is valued above the individual. Everybody contributes, anybody might be sacrificed, and personal desires are suppressed in favour of group harmony. Collectivist cultures are more socially oriented, demonstrating less personal independence and more consideration for the general community than is usual in individualistic cultures (Price & Crapo, 2002).

Sidin (1994) uncovers the patterns of family decision making in Malaysia and investigated whether the influence of wives varies with factors such as social class and cultural groups. Two hundred and forty couples in four different cities in Malaysia were interviewed regarding their roles in decision making for purchases of furniture, electrical appliances, and groceries and eating out. Role structure was found to be product specific. Wives' influence in the decision making process was found to vary across social class and cultural groups for the purchase of groceries.

Joint Purchase Decision

Firms must be aware of family purchasing behaviour, in order to implement appropriate marketing strategies. The differences as to who makes the decisions within the family can be determined by different variables, which will show how the power relations within the family unit are produced. It is of interest, therefore, to know who exercises influence in each decision that is made. Within this context of family decision-making, this paper concentrates exclusively on the study of the influence exercised by the spouses in vacation decision.

A number of prior body of research has concluded that the amount of influence depends on the family/household characteristics (Howard & Madrigal, 1990). Scanzoni and Szinovacz (1980), focusing on traditional versus modern sex roles found that traditional sex roles were sharply different and rigid, and tend to make family decision-making quite simple; that is the expected behaviours of the husband-wife are quite clear. In the more modern sex role, the behaviours of each spouse are becoming less predictable because of the increased flexibility and freedom associated with the role. In a study of changing female roles on family purchase patterns, Green and Cunningham (1975) found that husbands of modern wives tend to make fewer purchase decision than husbands of traditional wives. Schwenk (1983) also reported similar findings. Yet there remains a big research vacuum addressing the role of family structure on joint decisions made by spouses. Since joint decisions are becoming more and more common due to the changing family structure, it is therefore of urgent need to address this issue of key family structural influence on jointly decided products. This need is addressed in the current work with a focus on specialty product (vacation).

Specialty products are consumer products and services with unique characteristics or brand identification for which a significant group of buyers is willing to make a special purchase effort (Armstrong & Kotler 2003). Examples include vacation destinations, specific brands and types of cars, high-priced photographic equipment, designer clothes, and the services of medical or legal specialist. Vacation, for example, is a specialty product because buyers are usually willing to travel great distances to buy one. Buyers normally do not compare specialty products. They invest only the time needed to reach dealers carrying the wanted product (Armstrong & Kotler 2003).

METHODOLOGY
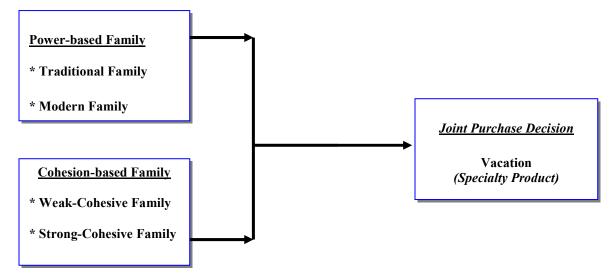
From the literature, two structural dimensions of the family are distinguished: power and cohesion (Kirchler 1989). From this distinction, four family types used in this research were identified – the traditional family, the modern family, the weakly cohesive family, and strongly cohesive family (Holdert & Antonides, 1997). The dependent variable is final purchase decision on vacation. This is the third and final stage of Davis and Rigaux's (1974) three stages of the family decision-making process, the first two being problem recognition and information search, both of which are beyond the scope of this research. The specialty product chosen is vacation, because it has been identified by prior body of research (e.g. Davis & Rigaux 1974; Holdert & Antonides 1997; Belch & Willis 2001) as jointly decided by husband and wife.

With this in view, the following two hypotheses were developed for testing:

Modern family will make more joint purchase decision on vacation than traditional family (hypothesis 1).

Strong cohesive family will make more joint purchase decision on vacation than the weak cohesive family (hypothesis 2).

Figure 1: The Schema of the Influences on Joint Vacation Decisions.

Questionnaire was used in the study. The population of the study is married couples in Kota Kinabalu, Sabah, Malaysia. The list of married couples registered with the Statistic Department in Kota Kinabalu, Malaysia was used as the sampling frame. The responding couples were randomly chosen from the list. Questionnaire was distributed personally and through the post mail to the selected families. Request to spouses to complete the questionnaire separately and independently was included in the questionnaire. The purpose is to help check any influences each spouse's opinion might have on the other.

Validate items from previous studies was used to measure the study constructs. The questionnaire is of four parts. In the first and second parts, joint family purchase decision and family structure were determined, with items adapted from Moschis and Moore (1979) and Carlson et al (1990). To categorize families into these types, statements were assessed by means of a four and five point Likert scales respectively. Then following Moschis and Moore (1979) the scales were summed and families classified as 'high' or 'low' on each dimension by splitting up at the median. The third part of the questionnaire contains demographic information about the respondents. Single items were used to measure demographic variables such as age, occupation, gender, education, years of marriage, etc. of respondents. The research data were analysed using the SPSS program. Descriptive statistics were generated to explain the profiles of the respondents. Multiple regression analysis was used to predict the construct relationships.

RESULTS AND DISCUSSION

A total of 206 usable questionnaires (103 sets) were collected and analysed. Table 4-1 below shows the profile of the respondents. There is equal number of male and female responses, 50% are female and 50% are male. This equality was achieved by a deliberate effort to get both spouses to respond. Since the instrument was sent in a set of two to both spouses, they were instructed to fill them out independently. On aggregate the age of the respondents are as follows: below 40 years (68%), 40 years and above (32%). The races of the respondents are Malay (14%), Chinese (35%), Kadazan-Dusun (21%) and bajau & murut (13), others (17%). All the respondents are married. The length of period of marriage are as follows: less than 2 years (38%), between 2-10 years (32%), 11 years or more (30%). The educational background of the respondents is as follows: non-graduates (58%) and graduates (42%). The annual income of the respondents is below RM20,000.00 (19%), RM20,000 to RM39,999.99 (25%), 40,000.00 to RM59,999.99 (23%), RM60,000.00 to RM79,999.99 (15%) and RM80,000 and above (8%), no income (11%).

Table 2: Profile of The Respondents

Variables	Categories	Frequency	Percentage
Sex	Male	103	50
	Female	103	50
Age	Below 40 years	140	68
	50 years and above	66	32
Race	Bajau & Murut	27	13
	Malay	29	14
	Kadazan-Dusun	43	21
	Chinese	72	35
	Others	35	17
Years of Marriage	Less than 2 years	78	38
	2-10 years	66	32
	11 years or more	62	30
Education	Non-graduate	119	58
	Graduate	86	42
Annual Income	Below RM20,000	38	18
	RM20,000-RM39,999.99	51	25
	RM40,000-RM59,999.99	47	23
	RM60,000-RM79,999.99	30	15
	RM80,000 and Above	16	8
	No income	23	11

RELIABILITY OF MEASURES

The reliability test was done on the items measuring the following dimensions: joint decision-making on specialty product (vacation), cohesion-based family, and power-based family. The Cronbach Alpha for all the items are well above .60 'floor' recommended by Hair at al (1998), which indicates high reliability. Table 3 below summarizes the results of the reliability test of the variables, mean and standard deviations.

Table 3: Statistics of the Composite Variables

	No of Items	Mean	S/D	Cronbach Alpha
Specialty product decision	3	3.62	1.01	.9142
Cohesion-based family	4	3.59	1.04	.9065
Power-based family	4	2.88	.74	.8522

Hypothesis Testing using Multiple Regression

The multiple regression analysis was employed to test the construct relationships. This section presents the results of the multiple and hierarchical regressions used to test the hypotheses stated in this study. Hair et al., (1998) see regression analyses as by far the most widely used and versatile dependence multivariate technique, applicable in every facet of business decision-making, hence the study's choice of regression model to analyse the relationships. The assumptions of regression analysis were tested to ascertain non-violation: (1) linearity of the relationship, (2) constant variance of the error terms (homoscedasticity), (3) independence of the error terms (no autocorrelation), and (4) normality of the error term distribution.

The four basic assumptions were met. Firstly, linearity was assessed through an analysis of residuals and partial regression plots, which does not exhibit any non-linear pattern to the residuals, thus ensuring that the overall equation is linear. The next assumption deals with the constancy of the residuals across values of the independent variables. The analysis is again through examination of the residuals, which shows no pattern of increasing or decreasing variations in the residuals. The third assumption is about the effects of carryover from one observation to another, thus making the residual dependent. It is confirmed that there is no auto-correlation problem (i.e. the error term in the independent variables are not correlated). This was checked by looking at the Durbin-Watson values to confirm that they fall within the acceptable region of 1.5 and 2.5, as any value outside this range indicates the presence of auto-correlation problem in the regression. For the forth assumption, a check for normality of the error term was done by a visual examination of the normal probability plots of the residuals, and the regression variate was found to meet the assumption of normality. To check for outliers (i.e. cases falling at the outer ranges of the distribution that may be potentially biasing the results), a threshold of 3 standard deviations was used for the residuals, which is appropriate for our sample size of 206 (Hair et al., 1998) to identify outliers. All observations outside this range (3σ) were considered outliers and were duly dropped from the regression.

Categorization of family types follows the method used by Moschis and Moore (1979) and Carlson et al (1990). The scales were summed and families classified as high or low on each dimension by splitting up at the median. Below the median are traditional families and weak cohesive families, and above the median are the modern and strong cohesive families. Dummy variables were created before using the family categories in the regression analysis. These are the independent variables used to account for the effect that different levels of a non-metric variable (family types in the present case) have in predicting the dependent variable (Hair et al 1998). In creating the dummy variables, the first step was to decide the number of dummy variables, which is simply $k – 1$, where k is the number of levels of the original variable. In this instance $2 – 1 = 1$ dummy variable was created as follows:

(a) Weak cohesive family = 0 (un-coded variable) & Strong cohesive family = 1 (coded variable).
(b) Traditional family = 0 (un-coded variable) & Modern family = 1 (coded variable).

Standardized beta coefficients were reported in this research. This is because standardized regression coefficient allows for a direct comparison between coefficients as to their relative explanatory power of the dependent variable (Hair et al. 1998).

Hypotheses Testing

Table 4 shows the results of the regression analysis used to determine the relationship between family structure (cohesive and power-based family) and decision on specialty product (vacation). The results show that family structure contributes significantly (F = 67.92; p < .001) and predict 41% of the variations in joint vacation purchase decision.

Details of the results show that the coded variables namely, strong cohesive family (t = 5.64; p < .001) and modern family (t = 4.20; p < .001) are respectively more significantly positively associated with joint vacation decision as compared to weak cohesive and traditional family. The results indicate that strong cohesive family significantly makes more joint purchase decision on vacation (specialty product) than weak cohesive family. Also modern family make significantly more joint purchase decision on vacation than traditional family. These confirm the validity of hypotheses 1 and 2. The study shows that there is a significant relationship between family type and joint purchase decision on vacation. The coefficient of determination shows that family typing explains forty percent of the changes in joint decision on vacation.

Table 4: Impact of Family Structure on Joint Decision on Specialty Product

Independent variables	Beta coefficients	t-value	p-value
Dummy for cohesive-based family	.400	5.637	.000
Dummy for power-based family	.298	4.197	.000

R^2 = .401   F = 67.916   Sig. F = .000
Dummy definition: Weak cohesive = 0;   Strong cohesive = 1
Traditional family = 0;   Modern family = 1

It is observable, that strong cohesive family, make significantly more joint decision on vacation than weak cohesive family; and modern family make significantly more joint decision on vacation than the traditional family. Thus, the degree of emotional bonds between spouses and the degree of potential and actually exerted power is an important factor of joint purchase decision. Strong cohesive families, known for strong interdependence, harmony, and high consideration for others, make more joint decision on vacation, such as where to go, when to take a vacation, and how much to spend on the vacation than weak cohesive families marked by low interdependence, disharmony, egoism. Similarly, families exhibiting equal distribution of power between spouses, short power distance, etc. tend to make more joint decision on vacation than families marked by strong traditional role differentiation, male domination, etc. atypical of a modern family.

The results presented above show that family structure is a very important factor in making joint purchase decisions by spouses. Specifically, modern family is more likely to make joint decision on issues concerning the family vacation than traditional family. Strong cohesive family is more likely to make joint purchase decision on vacation issues than the weak cohesive family. These reflect the robustness of family typing in determining whether purchase decisions are made jointly by Malaysian spouses.

Clearly, the results show that the type of family established by the spouses will determine to what extent they will make purchase decisions jointly. Thus, the degree of emotional bonds between spouses and the degree of potential and actually exerted power are important factors of joint purchase decision.

IMPLICATIONS AND CONCLUSIONS

These findings support the theorizing of Davis (1976), which argues that modern relationships are characterized by a high degree of joint participation in carrying out tasks and taking decisions. Prior research (e.g. Kirchler 1989) has also shown that a higher degree of cohesion is associated with a more harmonious family life and less egoistic decision making by the family members. The outcome of this research not only supports Kirchler's views but also takes it further by proving that the view holds, even in the decisions on the purchase of vacation.

The research also holds important implications for practitioners interested in the subject of family decision-making. Firstly, the research gives empirical evidence supporting the preponderance of strong cohesive family over the weak cohesive family in making joint decision on vacation, as well as that of the modern family over the traditional family. Thus, promotional efforts by marketers of tourism products should not be addressed to any particular member of the family but to both. The use of exclusive campaigns that are gender-based may not be effective since both couples have equal say in the decision on what to buy, when to buy, and how much to spend. Market segmentation based on gender should be scarcely used (if at all) since there is no real benefit from its usage. Marketers particularly those selling vacation should develop strategies that are not gender bound and strategies that appeal to both spouses when they are targeting modern families and strong cohesive families.

In conclusion, the paper argues that family structure is a key factor in determining joint vacation purchase decision by Malaysian spouses. Specifically, strong cohesive families tend to make more joint purchase decisions than weak cohesive families. Modern families tend to make more joint purchase decisions than traditional families.

REFERENCES

Armstrong, G and Kotler, P. (2003). *Marketing: An Introduction*, New Jersey: Prentice Hall.

Belch, M.A. & Willis L.A. (2001). Family Decision at the Turn of the Century: Has the changing structure of households impacted the family decision-making Process? *Journal of Consumer Behaviour*, 2(2), 111-124.

Carlson, L. Grossbart, S. and Tripp, C. (1990). An Investigation of mothers' Communication Orientation & Patterns, *Advances in Consumer Research*, 17, 840-872.

Corfman, K.P. and Lehmann, D.R. (1987). Models of Cooperative Group Decision Making and Relative Influence: An Experimental Investigation of Family Purchase Decisions, *Journal of Consumer Research*, 14, June, 1-13.

Cox, E.P. (1975). Family purchase decision making and the process of adjustment, *Journal of Marketing Research*, 12, 189-195.

Davis, H.L. (1976). Decision Making Within the Household, *Journal of Consumer Research*, 2, (4), March, 241-60.

Davis, H.L. and Rigaux, B.P. (1974). Perception of Marital Roles in Decision Processes, *Journal of Consumer Research*, 1(1), June, 51-62.

Ferber, Robert. (1973). Family Decision-Making and Economic Behavior, in: Family Economic Behavior, Problems and Prospects, ed. E.B. Sheldon, Philadelphia: J.B. Lipindt Co.

Fitzpatrick, Mary A. (1984). A Typology Approach to Marital Interaction: recent Theory and Research, in *Advances in Experimental Social Psychology*, 18, ed. Leonard Berkowitz, New York: Academic Press, 2-47.

Green, R.T. and Cunnigham, I.C.M. (1970). Employment status, feminine role perception and family purchasing decisions, *Journal of Business Research*, 4, November, 313-324.

Hagenaars, A. J.M., and Wunderink-Van Veen, S.R. (1990). Soo Gewonne Soo Verteert. Economics of the Household Sector, (in Dutch) Leyden: Stenfert Kroese.

Hair, J.F., Jr., Anderson, R.E., Tatham, R.L., Black, W.C. (1998). *Multivariate Data Analysis*, (fifth edition), New Jersey: Prentice Hall, Inc.

Holdert, F. and Antonides, G. (1997). Family Type effects on household Members' Decision Making, in *Advances in Consumer Research 24*. Eds. Merrie Brocks and Deborah J. McInnis. Provo, UT: Association for Consumer Research, 48-55.

Howard, D.R. and Madrigal, R. (1990). Who Makes the Decision: The Parent or the Child? The perceived influence of parents and children on the purchase of recreation Services, *Journal of Leisure Research*, 22(3), February, 8-13.

Kirchler, E. (1989). *Buying Decisions in the Private House-hold, (in Germany),* Gottingen: Hubert & Co.

Kling, Z (1996). The Malay family: Beliefs and realities, Department of Anthropology and Sociology, University of Malaya, 43-66, available at http://www.cicred.ined.fr/rdr/rdr_a/revues/revue79-80/14-79-80_a.html

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation, *Psychological Review, 98*, 224-253.

Michael.S and Diana, S. (2003), A cross-cultural and psychological observation of the Malaysian-Chinese culture in Australia, Cross-Cultural Psychology Working Paper, Semester 1, BESC 1318.

Moschis, G. P. and Moore, R.L. (1979). Family Communication and Consumer Socialization, *Advances in Consumer Research*, 6, 359-363.

Lu, L., Gilmour, R., & Kao, S. F. (2001). Cultural values and happiness: An east-west dialogue, *Journal of Social Psychology, 141*, 477-493.

Olson, D. H., H. McCubbin, H. L. Barnes, A. S. Larsen, M. J. Muxen and M. A. Wilson (1989), *Families. What Makes Them Work?* Beverly Hill, CA: Sage.

Price, W. F., & Crapo, R. H. (2002). *Cross-cultural perspectives in introductory psychology* (4th ed.), Pacific Grove, CA: Wadsworth.

Reiss, Ira L. (1965). The University of the Family: A Conceptual Analysis, *Journal of Marriage and the Family*, 27, 443-453.

Scanzoni, J. and Szinovacz, M. (1980). *Family Decision Making: A Developmental Sex Role Model*, Beverly Hills, CA: Sage Publications.

Schwenk, N. (1983). *Exploratory analysis of husband-wife decision making*, Unpublished Master's thesis, University of Maryland.

Sidin, S.M. (1994). The Patterns of Role Structure in Family Decision Making in Malaysia, *Journal of Asian Business*, 10(3), available at http://www.umich.edu/~cibe/JAB/10.3.htm

U.S. Bureau of Census (1986). *Population Profile in the United States*, U.S. Series P-20, No. 324, Washington, DC: U.S. Government Printing Office.

User Satisfaction at Urban Parks

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ABSTRACT

Evaluation of park users' judgements of a satisfactory park experience can be helpful in understanding park users' needs and wants. This exploratory study demonstrates a new instrument for assessing users' satisfaction of urban parks. From the study, park users' characteristics, visit characteristics, perceptions of park attributes quality, and evaluation of park experience were identified. In addition, the study also reveals that proposed user satisfaction construct can be a useful tool to measure satisfaction at urban parks. The importance of quality experience at urban parks was found at an average, and requires further quality management consideration from park planners and park management teams. However, reflection for repeat studies on adaptation to the construct is highly recommended since this study is a pioneer in the field of urban park and satisfaction.

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INTRODUCTION

Local government has provided urban parks as a place for leisure. However, those who are responsible for park management such as park planners and park management teams must be aware of parks' quality which influence users' satisfaction. Specifically, the parks users' needs and wants which may be affected by park attributes and management actions need further consideration if users' quality park experience is an expected outcome from managing an urban park.

Most people could have realized the importance of urban parks as a place for socializing, relaxation, and sports. However, with little to no revenue generated by most urban parks to its providers, the importance of quality management may have always been ignored. Since a review of the literature suggested that very few studies were conducted on urban parks; and no studies were conducted to relate park users and satisfaction, a pioneer study for assessing urban park users' satisfaction is necessary.

More specific, a proposed research is aimed to assess user satisfaction with regards to user characteristics, perception of parks attributes quality, and evaluation of park experience. Comparison between user perceptions from different parks is desirable.

LEISURE

Researchers have varying views regarding the definitions of leisure. The twentieth century literature writings, descriptions, and theories reveals that people give meanings of leisure as blocks of time (e.g. existence, subsistence, discretionary and leisure), activities, state of mind, and holistic/meaning. According to Torkildsen (1986), growth of leisure is very subtle. Thus, it is hard to create clear lines for its development. Coalter et al (1988) state that leisure in the early nineteenth century was encouraged by social and economic changes. More specifically, societies began to be concerned for public health and fitness of the workforce.

Further, Kelly (1982) recognizes three main benefits of leisure, with regards to recreation of people, which are personal, societal, and economic. He argues that personal benefits of leisure are in terms of psychological, mental health, physical health, and human development. Societal benefits on the other hand, involves family interaction, social cohesion, resources economics, and environmental appreciation.

Leisure Needs

According to Torkildsen (1986), personal factors (such as age, stages in life, interests, culture), social circumstantial factors (such as social setting, job, income), and opportunity factors (such as resources facilities, programs, activities) predetermines individual's leisure pattern. He suggests that individual's choices of leisure experience are influenced by the said choice factors.

Moreover, Argyle (1996) claims that marriage affects leisure. He states, "most leisure is now based in the home, and much leisure is done as a couple, rather than individual" (108). Eagles and McCool (2002) demonstrate that effective management of visitors at national parks influences the quality of experiences visitors get. Further, he argues that understanding park visitor's characteristics, motivations and expectations help leisure managers develop programs that enhance quality of experiences and opportunities visitors achieved.

URBAN PARK

According to Gentill (1991), an urban park is "the garden fashion of Victorian England designed to allow passive recreational activities such as strolling along pathways, admiring the floral displays and listening to a band" (123).
People visit a park for various purposes. Thus, it is important for park planners and management teams to understand park attributes that could maximize the visit experience of park users. According to Manfredo et al. (1996), in order for park managers and planners to efficiently manage parks, they must be aware of the park attributes. Eagles and McCool (2002) state that all type of parks requires some kind of infrastructure to accommodate the needs of their users.

Many researchers would generally associate urban park with leisure activities. According to Kuo et al (1998), urban parks and open spaces act as places in cities that improve people's well being and encourage people's involvement in physical activities. In addition, an urban park is created for the use of all people in a community. Park users are usually people in groups according to socio-demographic characteristics, age, ethnicity, and the residential areas these groups are in (Lieberg, 1995; Crawford and Godbey, 1987). Similarly, Zinn and Manfredo (2000) emphasize that the characteristics of park user groups are usually distinct from one another. Some research projects have been conducted in relation to urban parks

Park Attributes

Conway (2000) suggests that safety influences people's visits to a park. According to Coley et al (1997), environmental features such as trees and work repairs influence people's perception of safety at a park. In addition, Briggs and France (1980) suggest that visual quality influences potential use of a place. Similarly, Hammit et al (1994) note that people's park experience is influenced by the visual appearance of the parks. According to Godbey (1985), the convenience of reaching the location of a park determines people's interest in visiting. Likewise, Ditton et al (1983) claim that crowding influence park user's experiences.

Ravenscroft and Markwell, (2000) investigate social and racial integration of minority group park users, and discover no social integration occurred. In addition, La Page (1983) reports that the New Hampshire Division of State Parks use "report cards" to assess the satisfaction of campers at the park. In measuring user satisfaction at an outdoors recreational setting, Noe and Uysal (1997) suggests that expressive and instrumental factors predict overall satisfaction better than expectation and past-use. However, they too based their studies on national parks.

CUSTOMER SATISFACTION

According to World Tourism Organization 1985, (cited in Pizam and Ellis, 1999: p. 327) customer satisfaction is a "psychological concept that involves the feeling of well being and pleasure that results from obtaining what one hopes for and expects from appealing product and/or service". For the purpose of this study, customer satisfaction is assumed to be the user response to the quality of park attributes and park service performance with relation to the leisure experience.

Components of customer satisfaction

According to Barsky (1992), expectation is a standard that consumers use to judge a product or service experience. He notes that this situation involves comparison of the pre-experience standards (expectation) with perception of product or service performance (quality). Martin and Simmons (1999) views expectation as perceived standard or reference point. It is used as a guide in examining decision-making behaviour. In addition, Miller (1977) proposes that expectation is associated with different levels of performance which are" ideal", "expected", "deserved", and "minimum tolerable". In addition, Zeithaml et al (1993) suggests that feeling of satisfaction from an expected service performance is achieved within the range of "Zone of Tolerance" between the "Desired Service" and the "Adequate" (Zeithaml et al, 1993). Experience helps customers generate expectations of likely needs and wants (Cadotte et al, 1987). To explain service quality as a

function of the difference or gap between the expected and the perceived quality, Parasuraman et al (1985) developed SERVQUAL.

Furthermore, Taylor and Baker (1994) suggest that the relationship between service quality and purchase intention is moderated by satisfaction. When both perceptions of service quality and satisfaction are high, the level of purchase intention is at the highest. Baker and Compton (2000) study reveals that performance quality is possibly a more useful measure than satisfaction in assessing behavioural intentions. However, Oh (1999) suggests that intention to repurchase and intention to recommend is a direct outcome of perceptions, value, and satisfaction. Furthermore, recommendation is perceived as word of mouth and it results from perceptions, value, satisfaction, and repurchase intention.

SERVQUAL SCALE

Essentially, in their original version of SERVQUAL, Parasuraman et al (1985) identified ten dimensions for assessing service quality. However, in a later study, Parasuraman et al (1988) find that some of the dimensions suggested earlier overlap with each other. As a result, they suggested the dimensions to be reduced to five as described below:

> Tangibles:
  Visual and physical facilities, equipment and appearance of personnel
> Reliability:
  The ability to perform the promised service dependably and accurately
> Responsiveness:
  Prompt service and willingness in serving consumers
> Assurance
  Employees' knowledge and ability to serve customers
> Empathy
  Special care and attention the firm provides to customers

Each dimension is represented by four or five statements, which appraise customers' perceptions and expectations of service quality. Generally, 22 statements are asked related to a service firm and a retailing organization. The authors suggest that service quality is measured as the difference of scores Q=P-E (Quality=performance minus expectations) within the dimensions.

According to Bojanic and Rosen (1994), the SERVQUAL instrument is highly reliable and valid for use in different service industries after some modifications. However, researchers claim that the gap score is more reliable and valid if it measures perception only (Carman, 1990; Cronin and Taylor, 1992; Babakus and Boller, 1992). Carman (1990) argues that the reliability of the scale can be improved by expanding dimensions across different industries, and wordings and rating scales requires further refinement

HISTOQUAL SCALE

Frochot and Hughes (2000) proposed HISTOQUAL for use in measuring service quality in historic houses. Referring to the SERVQUAL scale, they present five dimensions of service quality that are responsiveness (staff efficiency and properties ability), tangibles (property environment), communications (historical information quality and detail), consumables (side services), and empathy (consideration of visitors' needs).

From their reliability and validity tests, they claim that their tool is useful for measuring service quality for historic properties under a same organization and tracking evolution of service delivery. Furthermore, the authors claim that their study confirms the usability of SERVQUAL scale as a useful tool, which needs adaptations when considering new services.

CERM CSQ SCALE

This instrument, developed by Howat et al (1996) was to assess service quality of public sector leisure centres in Australia and New Zealand. The authors present four service dimensions, which are core services, staff quality, general facility, and secondary services in order to represent attributes at leisure centres. Dimensional structure of the instrument is presented in Table 1 below.

Table 1 CERM CSQ Dimensions

CERM CSQ Dimension	Attributes
Core services	Program information
	Start/finish on time
	Activity range
	Organization
	Facility comfort
	Value for money
Quality equipment	
Staff quality	Staff responsiveness
	Staff presentation
	Staff knowledge
	Officials
General facility	Safe parking
	Facility cleanliness
Secondary services	Food and drink
	Childminding

Source: Howat et al (1996, p. 83)

Lentell (2000) claims that CERM CSQ is a useful instrument for assessing service quality at leisure centres. According to him, responses from large sample of customers in the development process make the instrument at an advantage. Essentially, reference of CERM CSQ scale helped him in developing a three-dimensional instrument usable in assessing customer satisfaction in UK local authority leisure centres.

METHODOLOGY

The purpose of this research is to measure user satisfaction at urban parks. This research will be exploratory in nature. It will explore how satisfied park users are with their local parks. Specific to this study, it is assumed that people who visit the park is somewhat reliable in providing their perception of the parks performance. Either they are active users, for example visiting the park everyday and use it or passive user (e.g. just cutting through as a shortcut).

Though the study is best supported by value for money and post purchase, it will be a pioneer study approached through method of user satisfaction. In this study, respondents will be asked to indicate their perceptions regarding the 3 dimensions of park attributes (tangibles, empathy, and accessibility). The lists of attributes for the three dimensions are based on aspects such as physical appearance, environment, transportation, and among others. Items asked to respondents were somewhat based on Parasuraman et al. (1985, 1988) multivariate SERVQUAL scale, Frochot and Hughes (2000) HISTOQUAL scale, and Howat et al. (1996) CERM CSQ scale. Though these scales are not directly used as scale measurement for this study, they are referred to because the nature of the study nearly matches with this research's. Moreover, Attitude on overall quality of the park experience, probability of recommending to other people, and the expectation will also be measured. Important attributes and other prospects related specific to park setting were chosen from Baker (2000) and Uysal and Noe (1997). Only some of the attributes were chosen to suit with the nature of this study.

In addition, this research is experimental. It involves developing a new instrument for measuring user satisfaction at urban parks. It also stands as an opportunity to test the uses of existing service quality and customer satisfaction measurement scales in a non-profit leisure setting. Otherwise, the usual leisure setting would normally be subjected to profit based organization. Based on the purpose of this research, three main objectives were established by the end of this research. These objectives are:
  - ➢ Determine if a three dimensional service quality scale, which was inspired by SERVQUAL, HISTOQUAL, and CERM SVQ is valid and reliable for assessing user satisfaction at urban parks.
  - ➢ Identify user and visit characteristics to urban parks
  - ➢ Investigate user perceptions of park attributes quality.

RESEARCH INSTRUMENT

Questionnaire design that revolves around three dimensions (tangible, accessibility, and empathy) was used to assess user satisfaction. Nine statements related to physical appearance and physical value of the park environment, equipment, facilities, safety, education, plants and flowers, and games are presented for the tangible dimension. Four statements present the accessibility dimension. The statements are related to access to the park by public transport, parking space, signage and bulletin. Moreover, empathy dimension refers to how the park management considers disability, age groups, crowding, lighting, and opportunity for leisure. For this dimension, six statements are presented. All the statements for the three dimensions are placed randomly to reduce order bias.

Both nominal scale and interval scale is used for this study. Likert type scale is used as attitudinal measure on the park attributes, overall quality, intention to recommend, and expectation. On the other hand, linear numeric is used in evaluation of the park importance. Moreover, test and retest reliability and parallel form reliability are used to test the stability of measure. In testing internal consistency reliability of different items measuring the same variables, Cronbach Alpha coefficient is used.

In testing for validity, Pearson Product Moment and correlation analysis is used. For construct validity, all variables of the three dimensions (tangibles, accessibility, and empathy) were first tested using convergent validity and discriminant validity. Criterion related validity, which involves concurrent validity and predictive validity was tested in part III of the questionnaire.

DATA COLLECTION

Primary data collection is done at Woking Park in Woking, Manor Park in Aldershot, and Stoke Park in Guildford. All parks are uniquely located. Stoke Park is located near to the University of Surrey; Manor Park houses a military base; and Woking Park is near to Woking, town of many Asian residents. These characteristics may enable researcher to make comparison of the result and add significance to the study.

Non-probability convenience sampling of the resident living in close proximity to the three parks is adopted to increase data accuracy. The meant proximity for this study is assumed as living within ten minutes drive to the park. Essentially, sample unit would be an individual who visits the park for any reasons. Each park will stand as the nucleus of the parameter being approximately 2 miles.

Sample size of 115 respondents was determined for this study. In addition, SPSS (Statistical Package for Social Science) version 11.0 is used to generate descriptive statistics and association between the variables involved. Frequency distributions show the measures of central tendency (mean. Median, mode); measures of dispersion (range, standard deviation and coefficient of variation). Moreover, to assess the relation of variables in each part, inferential statistic is adopted. Independent t-test is also performed on some of the demographic data to reveal if two different groups such as male and female have any significant different in their perceptions with the variables.

A pilot study was conducted to detect any possible shortcomings in its comprehension and to confirm its suitability for use. Thus, the sentences were revised. Few more park attributes were also added to increase the significance of the study outcome. Descriptive statistics of the pilot study shows that mean of the dimensions (tangibles, accessibility, safety, and empathy is between 3.5 to 3.8. Which means that respondents perceive the park attributes is somewhat not satisfactory. From the result of the pilot study, it is confirmed that the measurement scale is reliable and valid.

DISCUSSION AND FINDINGS

T-test and One Way ANOVA was used to analyze the significant difference for respondents' perception of the parks' experience. As indicated from table 2, there are significant differences between all three parks in all aspects except perception of overall importance of park. Interestingly, all parks score the highest for intention to recommend. In addition, the lowest mean score is for total empathy except for Guildford, which has the lowest mean score for total tangible.

Table 2: One Way ANOVA for Overall Park Experience

	Woking	Aldershot	Guildford	S. D	Sig.
Overall quality	5.3	4.6	5.7	1.2	0.01
Recommendation	5.3	4.7	6.0	1.2	0.00
Expectation	4.8	4.5	5.6	1.1	0.00
Total Tangibles	3.2	3.7	2.6	1.0	0.00
Total Accessibility	3.6	4.6	3.2	1.2	0.00
Total Empathy	3.1	3.5	2.8	0.9	0.01
Overall Importance	3.8	4.2	4.1	0.9	0.1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Specifically, Woking scores the highest for overall satisfaction and intention to recommend. Both aspects score 5.3 respectively. Though, the lowest score is for total empathy (3.1). For Aldershot, the highest score is intention to recommend (4.7), and the lowest score is total empathy (3.5). Furthermore, the highest score for Guildford is intention to recommend (6.0), and the lowest score is for total tangible (2.6).

Independent sample t-test used to compare means of perception difference between genders on all aspects of overall park experiences shows that significant difference for both genders is for total accessibility. Specifically, at a confidence level of 95%, only the p-value of total accessibility is at 0.05 and lower. This result shows that gender has an influence on respondent's accessibility to the parks.

Significant differences were also found for age group. Some of the age groups were combined to reach the total number of 25, the minimum valid number for ANOVA analysis. From the result, it is revealed that age influences respondents' perception of overall park importance. With significant value of 0.02 and the mean score of 4.2, respondents aged between 30-39 perceive that park is generally important.

Essentially, these findings can be summarized into characteristics of parks users, their visitation pattern, their perceptions of park attributes, and their satisfaction with park experience. Interestingly, it was revealed that main park users are female aged between 30-39 years old. Surprisingly, these park users are mostly professionals, and people with at least up to GCSE/O level education level. Generally, they are British who perceived their total annual household income of £10,000 to £19,000.

Park users for all parks are quite identical. Difference in characteristics is only evident for Woking. Specifically, Woking park users are usually students, aged between 20-29, and holds master's degree. Not surprisingly, it was at Woking that various foreign nationalities were identified. Aldershot's park users perceived their total annual household income was under £10,000. This significant number may be due to response from military workers, who may perceive their total household income as small. Interestingly, parks users do visit their parks frequently, and spend at least 30-60 minutes to more than two hours during their visits. Indeed, they claim that they usually visit the park during the afternoon, and the main purpose for their visit was for socializing.

Surprisingly, visit characteristics of the park users were different for each park. In Aldershot, respondents visit their park at least once a day during the afternoon for 30-60 minutes. The same visit characteristics apply to Woking, except that the parks users in Woking were not sure about the frequency of their visit. The visit characteristics for Guildford were once a month with time spent at the park for one hour and more. Generally, the three-dimensional scale used in this study for measuring quality of park attributes is useful.

Obviously, park users were moderately satisfied with their parks. Overall satisfaction was greatly influenced by tangible park attributes such as facilities, visual appearance, and surroundings. Other park attributes such as accessibility and empathy does influence their overall satisfaction, but moderately. In addition, parks users see

park accessibility such as transportation, and accessibility in the park itself such as signage was not as they expected. Though, they would likely to recommend the parks to others. The reason for their action would be that not much improvement would be done on the parks.

Though, most park users were somewhat grateful that the government provides the parks for them, they still wish to see some improvements for facilities and equipments. In Woking and Aldershot parks, users wish to have a paddling pool, more playgrounds, more parking spaces, and more equipment such as seating and trash bins. Since Guildford has already have a paddling pool, users wish to see more equipments such as seating, and facilities such as parking space.

IMPLICATIONS

This study as mentioned earlier is exploratory in nature. In an attempt to assess user satisfaction at an urban park, the researcher have used a three dimensional service quality scale containing dimensions of tangible, accessibility, and empathy. These dimensions were proposed after referring to theoretical scales such as SERVQUAL, and HISTOQUAL, and CERM CSQ. Since the proposed user satisfaction construct is reliable and valid, it can be used for future reference on assessing user satisfaction at an urban park. Essentially, this construct can also be used to compare significant difference in user perceptions with their urban parks attributes.

Moreover, this study can be useful for strategic park planners and urban park management teams to understand park users' characteristics, visitation characteristics, and perceptions of park attributes. This study reveals that many aspects regarding park experiences need to be considered by park planners and park management teams. Since the park attributes dimensions mean scores are on the average for tangibles, accessibility, and empathy dimensions score, these people may consider improving mostly all aspects of park attributes at their urban parks. They cannot just provide the parks to people without knowing if what they provided were attractive and beneficial to the park users.

In addition, since parks are used by all people from all demographics background, the park planners and park management teams could provide suitable and enough park facilities. Enough equipment and a healthy environment for park users to have quality experience during their visit to their parks are also important. This study though was successfully conducted were restricted to several limitations. The limitations are characterised as follows:
> *Sample Size*
> The sample size is not enough for producing significant difference in aspects such as gender, age group, and occupation for each park.
> *Data Collection*
> Due to the time constraint and security issue, distribution of respondents for each park was uneven.
> *Park Attributes*
> Since the lists of park attributes were exhaustive, and no previous studies could clearly define park attributes for use in this type of study, some of the important park attributes suitable for this study could have been missed out.
> *Sampling*
> Samples used for this study was selected to represent different social and economic background. But, it was not evident that the parks users characteristics were obviously different.

CONCLUSION

To conclude, this study though with many limitations is somewhat successful. The findings form this study is reliable and useful for use in measuring user satisfaction of urban park. Since very few studies were conducted in assessing user satisfaction at urban parks, future studies specifically focused on urban park and user satisfaction is suggested. As this study is also exploratory and a pioneer of its kind, repeat studies is important. For future studies, it is suggested that adaptations to the proposed construct is made. In addition, researchers should also use a bigger sample size. Careful considerations of other different park attributes is also needed to ensure that users consider park attributes other than suggested to them in this study. Moreover, other parks far away with distinct economic background, and social background could be studied and compared.

Moreover, the findings reveal that respondents' age group, perception of park importance, and gender does influence the respondents' perceptions of accessibility. Furthermore, the findings from this study are valuable for park planners and managers to use as guidelines for managing urban parks that are satisfactory for the users. With the information available from this study, park managers and park planners can devise plans and actions for managing quality urban parks that are attractive and beneficial to the park users.

This study has provided useful research implications for assessing user satisfaction at an urban park. Indeed, findings from this study will contribute to the body of knowledge especially in studies of urban parks and satisfaction. However, since this study is exploratory in nature, and has its limitations due to unavoidable circumstances, reflection of repeat studies is suggested. Essentially, this study reveals that park planners and park management teams need to understand the parks users in providing urban parks to the community. This study too will enable decision makers to understand urban park importance. It is also hoped that many people may realise the value of urban parks and the value of satisfying leisure experience at urban parks. Furthermore, it is also hoped that people from the government would be able to take actions regarding provision of urban parks as a place for leisure.

REFERENCES

Argyle, M. 1996. *Social Psychology of Leisure*. London: Penguin

Baker, C., 1998, Urban Park Attributes, *Unpublished MSc Dissertation*. Guildford: University of Surrey

Baker, D. A., and Crompton, J 2000, Quality, satisfaction and behavioral intentions *Annals of Tourism Research,* 27[3], 785-804

Barsky, J. D., 1992, Customer satisfaction in the hotel industry: meaning and measurement, *The hospitality Research Journal,* 16 [1] 50-73

Barsky J. D. and Labagh,R., 1992,A strategy for customer satisfaction *The Cornell Hotel and Restaurant Administration Quarterly,* 33 [5] 32-40

Bojanic. D. C., 1996,Consumer perceptions of price, value and satisfaction in the hotel industry: an exploratory study, *Journal of Hospitality and Leisure Marketing,* 4[1] ,4-22

Bojanic, D. C. and Rosen, L. D., 1994, Measuring service quality in restaurant: an application of the SERQUAL instrument, *Hospitality Research Journal,* 18,3-14

Cadotte, E. R., Woodruff, R.B., Jenkins, R. L., (1978), Expectations and norms in models of customers satisfaction, *Journal of Marketing Research,* 24(August), 305-314

Carman, J. M., 1990, Consumer perceptions of service quality: an assessment of the SERQUAL dimensions, *Journal of Retailing*, 66 (1) 33-55

Churchill, Jr.,G.A.and Supernaut,C., 1982, An investigation into the determinations of customer satisfaction, *Journal of Marketing Research, 19* (November), 491-504

Clay, G., and Daniel, T., 2000, Scenic landscape assessment: the effects of land management jurisdiction on public perception of scenic beauty. *Landscape and Urban Planning*, 49:1-13

Coalter, F., 1990, *Mixed Economy of Leisure: the historical background to the development of the commercial, voluntary, and public sectors of the leisure industries*. In Henry, I., Management and Planning in the leisure industries, London: Macmillan, pp. 1-31

Coley, R., Kuo, F., and Sullivan, W., 1997, Where does community grow? The social context created by nature in urban public housing. *Environment and Behaviour*, 29(4), 468-494

Conway, H., 2000, Everyday Landscape: Public parks from 1930-2000. *Garden History*, 28(1), 117-134

Conway, H., 2000, *Public Parks*. Pembrokeshire:CIT

Cranz, G., 1982, *The politics of park design: A history of urban park in America*. Cambridge: MIT Press

Crawford, D., and Godbey, G., 1987, Reconceptualizing barriers to family leisure. *Leisure Sciences*, 9:119-127

Cronin, J. and Taylor, S., 1992, Measuring service quality: a reexamination and extension, *Journal of Marketing,* 56(July), 55-58

Ditton, R., Fedler, A., and Graefe, A., 1983, Factors contributing to perception of recreational crowding. *Leisure Sciences*, 5(4), 273-289

Eagles, P., and McCool, S., *Tourism in National Parks AND protected Areas: Planning and Management*. New York: CABI.

Fick, G. R. and Ritchie, J.R.B., 1991, Measuring service quality in the travel and tourism industry, *Journal of Travel Research,* 30 (2), 2-9

Frochot, I., and Howard, H., 2000, HISTOQUAL: The development of a historic houses assessment scale, *Tourism Management*, 21:157-167.

Gentil, T., 1991, Parks and Amenities. In Borret, N., (ed.), *Leisure Services UK: An introduction*, Hongkong: MacMillan, pp. 123-143

Godbey, G., 1985, Nonuse of public leisure services: a model. *Journal of Park and Recreation Administration*, 3:1-13

Hammit, W., Patterson, M., and Francis, P., 1994, Identifying and predicting visual preferences of southern Appalachian forest recreation vistas, *Landscape and Urban Planning*, 29:171-183

Haywood, K. M., 1993, The price-value relationship: perspective and definitional issues, *World Travel and Tourism Review*, 213-217

Howat, G., Absher, J., Crilley, G., and Milne, I. (1996). Measuring customer service quality in sports and leisure centers, *Managing Leisure: An International Journal*, 1:77-89

Kotler, P., Bowen, J. and Makens, J., 1998, *Marketing for Hospitality and tourism.* (2nd ed.).London: Prentice-Hall International Limited.

LaPage, W., 1962, The measurement and significance of recreational experience: a case study of camper satisfaction and its significance to recreation resource planning, *MSc Theses*, Durham: University of New Hampshire

Lieber S., and Fesenmaler, D. (eds.), 1983, *Recreation Planning and Management.* London: Venture

Lieberg, M., 1984, Teenagers and park use. *Communication Research*, 22(6), 720-744

Lentell, Robert, 2000, Untangling the Tangibles: 'Physical Evidence' and Customer Satisfaction in Local Authority Leisure centres, *Managing Leisure*, 5 1-16

Manfredo, M., Driver, B., and Brown, P., 1996, Measuring leisure motivation: A meta-analysis of the recreation experience preference scales. *Journal of Leisure Research*, 28(3), 188-213

Martin, D. and Simmons , P., 1999, Customer expectations : a conceptual model for understanding the expectations continuum, *Journal of Hospitality and Leisure Marketing*, 6(1), 67-79

Noe, Francis and Uysal Muzaffer, 1997, Evaluation of Outdoor Recreational Settings : A problem of measuring user satisfaction, *Journal of Retailing and Consumer Services, 4 (4) 223-230*

Oh, H., 1999, Service quality, customer satisfaction and customer value: a holistic perspective, *International Journal of Hospitality Management*, 18,67-82

Oliver, R L., 1980, A cognitive of the antecedents and consequences of satisfaction decisions, *Journal of Marketing Research,* 17 (November), 460-469

Parasuraman, A., Zeithaml , V. A. and Berry, L.L., 1985, A conceptual model of service quality and its implications for future research ,*Journal of Marketing*, 48(Fall), 41-50

Parasuraman, A., Zeithaml, V. A. and Berry, L.L., 1988 SERQUAL: a multiple –item scale for measuring customer perception of service quality, *Journal of Retailing*, 64(1), 12-40

Parasuraman, A., Zeithaml, V.A. and Berry, L.L., 1991, Refinement and reassessment of the SERQUARL scale, *Journal of Retailing.* 67 (4), 420-450

Parasuraman, A., Zeithaml, V.A. and Berry, L.L., 1993, More on improving service quality measurement, *Journal of Retailing*, 69 (4) 140-147

Parasuraman, A., Zeithaml, V.A. and Berry, L.L., 1994, Reassessment of expectations as a comparison standard in measuring service quality: implications for further research, Journal *of Marketing*, 58(January), 111-124

Pizam, A. and Ellis, T., 1999, Customer satisfaction and its measurement in hospitality enterprises, *International Journal of Contemporary Hospitality Management*, 11 (7), 326-339

Ravenscroft, N., and Markwell, S., 2000, Ethnicity and the integration and exclusion of young people through urban park and recreation provision, *Managing Leisure*, 5:135-150

Schuyler, D., 1986, *The new urban landscape: the redefinition of city form in nineteenth century America.* Baltimore: John Hopkins University Press

Steven, P., Knutson, B, and Patton, M., 1995, DINESERVE: a tool for measuring service quality in restaurant, *Cornell Hotel and Restaurant Administration Quality,* (April),56-60

Taylor, S.A. and Baker, T.L., 994, An assessment of the relationship between service quality and customer satisfaction in the formation of consumers, *Journal of Retailing* 70 (2), 163-178

Torkildsen, George, 1986, *Leisure and Recreation Management.* (2nd ed.). London: University Press.

Urry, J., 1995, *Consuming Places.* New York: Routledge

Zeithaml, V. A., Berry, L.L and Parasuraman, A., 1988, Communication and control processes in the delivery of service quality, *Journal of Marketing,* 52 (April), 36

Zeithaml, V. A., 1985, Consumer perceptions of price, quality and value: a means-ands model and synthesis of evidence, *Journal of Marketing,* 52,2-22

Zeithaml, V., Berry, L. and Parasuraman, A., 1993, The nature and determinants of consumer expectations of service, *Journal of The Academy of Marketing Science,* 24 (1), 1-12

Zinn, H., and Manfredo, M., 2000, An experimental test of rational and emotional appeals about recreation issue. *Leisure Sciences*, 22:183-194

Sport Tourism and Its Potential in Sarawak

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ABSTRACT

Globally, the concept of sport-related tourism has started to become prominent just in recent years. Instead of traditional tourism attractions and activities mainly based on sun, sea and sand, contemporary tourists are now more interested in activities related to sport that would lead to traveling, feeling of enjoyment, enhancing experience, achieving success or reward, and at the same time be able to boost one's health and fitness. These changing needs in the tourists market has resulted in increase production of sport-related tourism attractions and activities. There are lots of illustration and examples of sport tourism reported in Malaysia that supported the growth of this new sector. Sarawak too is eager to attract visitors by means of sport tourism as one of its major tourism attractions. Basically, sport tourism is a type of leisure-based travel away from home environment temporarily with an intention to watch or engage in attractions associated with sport. Researches have revealed that sport events can bring about many benefits to a destination. With delightful natural environment, fantastic cultural and physical character, available sport infrastructure and facilities, and supportive commercial and public, Sarawak is also promised to be a popular sport tourism destination in Malaysia. In addition, an exploratory tourist survey was performed conveniently to find out about their perception on Sarawak as a sport tourism destination. Perception and insights obtained from the survey were encouraging and supporting the potential of the new tourism in Sarawak.

OVERVIEW

In recent years, special interest tourism of various types has become increasingly popular. One form of special interest tourism, which has captured particular attention, is sport tourism or travels that related to sport activities and/or events. Yet, it is reported that the sport-based tourism (which based on sporting activities or events to attract tourist) has been already in the tourism phenomenon since 1980s and 1990s. As mentions by Bull (1990), it is an area of tourism industry, which has grown considerably during the 1980s and 1990s. The sport tourism events may range from small events to major international sporting activities or hallmark events.

Gibson (1998c) also noted that since 1980s there has been a growing demand for active vacations, especially those related to sport and physical activity. Consequently, during the health and fitness conscious decades of the 1980s and 1990s, entrepreneurs have increased the number of sport tours, developed more sport-specific resort destinations, established specialized sport cruises, added sports activity facilities and programs to hotel or resort, and increasingly promoted sporting events as an attraction for tourists (Gee, Makens, & Choy, 1997).

Originally, the phenomenon of people travel to involve in sport activities has started long time ago, as early as 776 BC to participate in athletic competitions to honor the God Zeus. Additionally, over 3500 years ago the Greeks have initiated the idea of staging athletic competitions (Cook, Yale, & Marqua, 1999). While the original competitions (the Olympic Games) in Greece were organized as contests, the Romans have expanded the idea of these competitions and stage them as games for public entertainment (Cook, Yale, & Marqua, 1999).

Instead of conventional tourism attractions and activities often primarily based on sun, sea and sand, contemporary tourists are now much more interested in activities that would lead to traveling, feeling of enjoyment, enhancing experience, achieving success or reward, and at the same time be able to boost one's health and fitness. Thus, these changing needs in the tourists market has resulted in increase production of sport-related tourism attractions, activities and facilities.

A lot of illustrations and examples have been reported to support the growing of the industry. Many nations have started to develop sport as their major tourism product after realizing the apparent significance that had been generated by the sport industry, which can contribute to the tourism industry (Noel, 2001). A lot of investment and other incentives have been allocated to boost the sport tourism industry. More and more tourism products involving physical and sporting activities and events have been developed. Even Malaysia tries to expand its sport tourism.

While in the state of Sarawak, the tourism industry is experiencing rapid growth over the last decades. Yet, Sarawak has a plenty of tourism resources to offer such as nature, culture based resources which have yet to be fully explored. The tourism industry has been recognized as a significant contributor to the state's economy toward generating economic income and provides employment opportunities. This sector has huge potential to continue to become a major contributor and the driving force of Sarawak's economy in the future, if the state can fully develop the tourism industry. This can be achieved through the development and exploration of more new tourism market.

Realizing the significance of the tourism industry, Sarawak is now in the effort to initiate tourism development to its fullest potential. Currently, it can be seen that most of the tourism products in Sarawak is based on culture and nature. Three major products have been identified to become main tourism strategy in Sarawak in its Second Tourism Master Plan. The strategy includes culture, adventure and nature (CAN). In addition to CAN, ecotourism has become one of the main selling points in Sarawak because of the high quality of its tropical rainforest resources. It has become the popular focus of the state government, and much of the development in the Sarawak's tourism industry is based on ecotourism. Nevertheless, the state's tourism players are still in the effort of diversifying its tourism products in order to give more choices to the visitors.

In Sarawak, the sport-based tourism is considered as a new phenomenon and still an untapped tourism product or market. Most of available sport events/activities cater for the special interest segments only, which necessarily means the sport events were normally small sporting events. However, the state tourism operator is now eager to organize some sport events after realizing the contributions of the sport based tourism, especially in term of its direct economic benefits. The impacts of the sport events being successfully organized in other states might give an encouragement or boost to Sarawak to organize more sport-based events. Examples of events that had been organized successfully in Kuching recently are the annual ITF World Junior Circuit Tennis Masters and Baleh Kapit Raft Safari.

Essentially, Sarawak has wonderful assets especially of nature and adventure. The network of rivers as well as the wonderful mountain range has enabled many sporting activities to be carried out. Most of the water-based sports have been carried out in national parks and other part of Sarawak's forests. Additionally, many sports infrastructure and facilities has been established in Sarawak in recent years. Examples of major sport facilities, which can be found in the state, include a sports complex complete with an indoor stadium, an Astroturf field and an olympic sized swimming pool, state football stadium, Sarawak State Stadium (Indoor Stadium) and golf courses. In short, Sarawak has the utmost potential in promoting sport tourism as one of its major tourist attractions. Together with popular support from related agencies and public, it is not possible for Sarawak to become a popular sport tourism destination in future.

Thus, the objective of this paper is to introduce sport tourism as one of today's attractive tourism sectors. Various aspects and concepts of sport tourism are discussed and applied to the case of Sarawak. In addition, this paper will also aim towards discovering the potential of sport tourism in Sarawak. The assessments are made based on an exploratory research survey of tourists' perceptions, interests and behaviors of the sport-related activities or events in Sarawak. Subsequently, this study may provide basic understanding to the events planners both from public and private sectors to better plan and market the events in the future. Hopefully, this may help to enhance the image of Sarawak as a recognized tourism destination.

THE GROWTH OF SPORT TOURISM

Over the past twenty years, sport is no longer just about playing the game, but it is perceived as a means that provide entertainment to the public, mainly through the radio or television broadcast. Now, it could be one of the attractions that motivate people to travel. Sport-based tourism has experienced an increasing attention from both the media community and academic publications in recent years, especially with the growing coverage of major sporting events (Gammon, 2003). In addition, the opportunities to engage in sport tourism have flourished as a result from the abundance exposure by the travel magazines, newspapers, television and radio commercials that focused on sport and physical activities in diverse destinations, attractions and events.

The growing of the sport tourism industry is mainly due to the rapid changing consumer preferences towards tourism products. Conventional leisure activities such as sightseeing and sunbathing may not always enough for the tourists. Vacationers are now prone to involve or participate in recreational or sport activities during their vacation (Zorba et. al., 2003; Foster, 1991). In 1994, a survey by Marriott International has found that majority of the respondents had viewed opportunity to engage in sports as one of the important factors when selecting a vacation (Gibson 1998a; 1998c). For that reason, it is essential for a destination to meet the constant changes of taste and lifestyle of the consumers as well as fashion trends in order to better targeting the market.

As Gibson, Willming and Holdnak (2003) observed that the last decade of the twentieth century was marked by a growing recognition of the apparent and inherent relationship between sport and tourism, and it is likely to be growing well and continue into the next century. Many countries have shown their interest in developing the sport tourism industry after noting the significance of sports in the tourism industry. Emphasis has been given to the sport tourism sector and the provision of facilities, training, marketing and promotion strategies had been encouraged by the governments in order to facilitate the development of sport tourism.

Australia and United States have recognized sport tourism as one of the most important tourism sector in countries and, plenty of development strategy had been formulated to develop the sport tourism industry. While in Canada, a lot of programs had been adapted by the Canadian Tourism Commission (CTC) since 19966 in order to promote community and tourism industry's interest in the development of sports tourism as a viable contributor to the economic well being of local communities (Commonwealth, 2000). Britain's Department of Culture, Media and Sport has already stressed on the government's intention to develop innovative niche markets such as the sports tourism (Commonwealth, 2000). In South Africa, the sport tourism was being identified as one of the major sectors that needed to be given more concentration.

Apparently, Sarawak too is in the effort of developing its sport-based tourism. Some sports-related attractions, activities and events have already been organized since early 90s, even though noted that most all were primarily based on nature and culture. Generally, the events were able to attract good responds and supports from the locals, domestic visitors and some foreign tourists. The production of events was heightened in 2003 as many sports-based activities/events as well as other touristic events were specially planned and organized as part of Sarawak's first "Tourism Year 2003" program. In terms of sport facilities and infrastructures, many sports infrastructure and facilities have been established in Sarawak such as golf courses, stadiums, swimming pools and courts to support local, national and international sport-related activities/games and events. In recent years, the sport activities and events have started to also include natural settings such as sea, rivers, mount, parks and reserved areas.

SIGNIFICANCES OF SPORT TOURISM

Sport tourism has boomed over the past 20 years. A study conducted by the Georgia Institute of Technology in Atlanta has shown that sports have grown from the 25th largest industry in the United States to the 11th largest (Kelly, 2000). In addition, Kelly (2000) also notes that the community size is irrelevant in developing the sport tourism. Research has shown that even a small town can also have an opportunity to develop the sport-based tourism industry, and such cities or countries might not need a world class facilities or huge budget in order to attract the world.

Basically, the profit and non-profit agency's intention to stage the festivals and events are due to several apparent reasons. Mayfield and Crompton (1995) had identified eight generic reasons why these organizations stage festivals and events: recreation or socialization, culture or education, tourism, internal revenue generation, natural resources, agriculture, external revenue generation, and community pride or spirit (cited in Turco & Lee, 1996). Interestingly, the "community spirit or pride" and "family" were ranked by the respondents as being the most important reasons for staging festivals or events (Turco & Lee, 1996).

A study indicates that success of mega hallmark events can bring lots of benefits to the countries economics and tourism industry (Games BID, 2003). The benefits are as the following:
- Long-term economic benefits from visitors who come as a result of an event's worldwide exposure are larger in total than short-term economic benefits.
- Foster a public sense of economic momentum, which in turn will foster new investment and economic growth.
- Mega events have a profound impact on the international convention business in the host cities. For example, Sydney has increased the number of international convention bids it won by 34 per cent after it was being chosen in 1993 to host the 2000 Games.
- Vancouver and Whistler in particular and British Columbia in general will have their profiles raised throughout the world, and strengthening the tourism industry. For example, before the Calgary winter Olympics in 1988, Alberta had an average annual growth of annual international visitors of 0.25 per cent (1972-1985). In Pre-Olympic years the number of visitors grew by five per cent in 1985 and eight per cent in 1986. In the Olympic year, growth surged to 12 per cent and then retained all of its post Olympics gains, with an average annual growth of 3.25 per cent for the first post-Olympic years. This compared with an average annual lose of 2.5 per cent for the rest of Canada, excluding British Columbia.

- International tourism in Norway increased by 43 per cent between 1990 and 1994 leading up to the Winter Olympics in Lillehammer, probably as a result of increased media awareness generated by the upcoming games.

Obviously, nearly every national or international sporting event is accompanied by claims of huge benefits that accrued to the host cities (Matheson, 2002). Malaysia also has tried to develop the sport-based tourism as one of the new product or attraction in the Malaysian tourism industry after realizing the potential of the sport tourism in attracting both local and foreign tourists. A study by the University of Malaya shown that the 1999 Malaysian Sepang Formula One Grand Prix has brought in more than 20,000 foreign spectators from Europe, Japan and other Asia Pacific countries (Thomas, 2000). Thus, the race has generated US $144 million in the direct spending for the Malaysian economic (Thomas, 2000).

Nowadays, spectator sport is a growing segment of the leisure, recreation, and tourism industries. The US Bureau of Economic analysis estimated that Americans spent $6.7 million in 1997 attending sporting events, compared to $4.5 billion in 1991 (Canon & Ford, 2002). While the 1999 British Open had brought about $20.1m revenue to the local economy through linkages of tourism with other economic sectors (Gelan, 2003).

A study by the Commonwealth Department of Industry, Science and Resources (2000) also found that the sport tourists have a higher yield than other types of tourists as can be seen through the Australian domestic sport tourist that spending 16% more on average per day, with 31% staying in the hotel, resort, motel or motor inn accommodation on their sports trip compared with 23% for all domestic travelers (Jago, 2003; & Commonwealth, 2000). Furthermore, Foo (2000) has found that 6% of daytrips that taken by Australians in 1998 and 5% of the overnight trips were for sporting purposes (quoted in Jago, 2003). Similarly, s study by Bureau of Tourism Research had found that the Australian domestic sports tourists were appeared to generate a higher dollar yield than other domestic travelers, with 31% staying in the hotel, resort, and motel or inn accommodation on their sports trip compared with 23% for all domestic travelers (Commonwealth, 2000). Research by Zorba et.al., (2003) suggest that a successfully executed sports and recreational programs will positively affect the length of time foreign tourist will spend at the lodging establishment, which in turn will increase the income of the recreation area.

Likewise, as sports and recreational activities/events are becoming popular among the Malaysians, tourism industry has realized that the sport-related events can bring a lot of economic benefits to Malaysia. As an illustration, the 1998 Malaysia Commonwealth Games had been reported to generate huge economic benefits to the country. A study by the research division of the Malaysia Tourism Promotion Board during the 1998 Commonwealth Games has revealed that a single international tourist that came for the event has spent an average of RM 307.64 per day or RM 3845.50 for the duration of 12.5 nights stay in Malaysia (Mohd, 1999). Besides, it also helped to raise the country's image in holding large sports events.

Travel by the sports spectators will particularly act as a catalyst for other tourism sector as well as other economic industry. As Gibson *et. al.*, (2002) point out that the fans contribute economically to the host community through their use of food services, accommodations and shopping related activities. Furthermore, Gee, Makens and Choi, (1997); & Mules (1998) stated that travel by spectators to games represents an important market for carriers, the lodging industry, accommodation, and the food and beverage industry, which can bring millions of dollars to the countries or states.

Apart from the economic contribution, the spots events can also contribute to the urban redevelopment and renewal. Hosting sports events is becoming a common strategy for the economic regeneration of many urban communities (Gibson, 1998b). Thus, mega-events could possibly act as a catalyst to urban development. For example in Malaysia, the government has spent US $5 billion to build sporting facilities and other facilities such as roads in conjunctions with the 1998 Commonwealth Games (Musa, 2000). While the Melbourne Olympic Games in 1956 has provided major facilities that contributed to the city's reputation as a sporting center for several decades (McDonnell *et.al.*, 1999).

Similarly, Karlis (2003) has argued that the organizing of the Olympic Games will attract the high-income tourist and attract the new generation of tourists who will make several visits to the host country, create favorable image for the destination, modernization of the tourism infrastructure, to enhance country's image in the international arena and provide a skilled work force. For example, the Sydney 2000 Olympic Games has represented as excellent opportunity to reinforce and consolidate Australia's sport infrastructure, and the infrastructures are catering for participation in sport at all levels and in all forms (Shilbury, 2000; McDonnell *et.al.*, 1999). The Olympics have offered Sydney's entrepreneurs and politicians an event to both reposition the city and to restructure the local economy into a more profitable industry (Waitt, 2003). Besides, Sport events are

also acknowledged as a moments of symbolic significance because of the high level of social interaction they provide, and the intensely personal identification they generate in their audience (Garcia, 2001).

Hosting the international sporting events such as Commonwealth Games, Formula one Malaysian Grand Prix and the Golf World Cup can help to raise the Malaysia's image and ability in offering and organizing excellent international sport events. Furthermore, sports events can help to overcome or cope with the geographically and seasonally circumstances (Gelan, 2003). Additionally, the sport events at the same time can also help to promote the country's other tourist attractions. For instance, the Le Tour de Langkawi (LTDL), the biggest cycling tour outside of Europe, which covered 10 states, can help to promote the whole country. As mentioned by the Minister of Culture, Art and Tourism Datuk Abdul Kadir Sheikh Fadzir, the staging of more international sporting events would promote the Malaysia's capability to host such events and at the same time it can help to promote the country's unique selling points – its diverse cultures, nature and history.

In short, many destinations including Sarawak are aggressively competing which each other to stage international sporting events after realizing its many potentials. These destinations are even willing to spend millions of dollars to organize such events not only for the sake of sport itself but more importantly to get the economic returns through various tourism-related activities and international exposure during the events.

UNDERSTANDING OF SPORT TOURISM

Basically, "sports" are physical activities that controlled by formal or informal rules for fun, recreation or rewards. Both competitive sport and non-competitive sport (e.g. recreational activities) are being included in the term of sport. Meanwhile, "tourism" is a phenomenon where people travel away from their usual environment to get involve in leisure and recreational activities. However, by combining both definitions on the sport and tourism, the term "sport tourism" can be defined as the a phenomenon where people travel away from their usual environment to be involved in either competitive or non-competitive sport-related activities/events for fun, recreation or rewards.

Meanwhile, sport can also be defined from the leisure perspective. As Kelly & Freysinger (2000) say that sport may be is a special kind of leisure, which involved challenge, excitement, involvement, community building, and satisfaction. There are also certain researchers that have defined sport as a cultural experience of the physical activity and challenge includes the ingredients of play, such as it can occur in the sense of spontaneity and the games participant will be facing some uncertainty as they need to compete fairly among each other to get the glory.

Yet, until today there are still no agreed or clear standard of definition that could be used internationally to describe the term sport tourism. This condition is quite acceptable as there is still a doubt whether can or should combine the sport and the tourism, as both are quite distinct from viewpoints of marketing, economic, financial, psychological, and sociological. According to Gibson (1998a) and Commonwealth (2000), some difficulties had occurred in defining the term sport tourism. This is because researchers of various fields have tried to define sport-based tourism from their own insights, which related to their distinct scope of studies. In addition, the complexity in defining the term sport tourism may be because of lack of coordination and cooperation between the sport industry and tourism industry. As Gammon (2003) observes that there is no or little academic communication between those working within tourism sector and those in sport industry.

Nonetheless, according to Gibson (1998a), sport tourism can be defined as one type of leisure-based travel that takes individuals temporarily outside of their home communities to play, watch physical activities, or idolize attractions associated with these activities. In order to simplify everything, Gammon and Robinson (2003) have classified sport and tourism under 2 conditions: "sport tourism" and "tourism sport". It appeared that the main dissimilarity between the two is that the differences in the tourists' primary travel motivations.

Sport tourism - Sport is the prime motivation for the individuals or groups of people to travel, to actively or passively participate in a competitive or recreational sport.

Tourism sport - The holiday or visit is the prime motivational reason for the individuals or groups of people to travel. Additionally, participating, whether actively or passively, in a competitive or recreational sport has become the secondary activity during the travel.

Gammon and Robinson (2003) also described that the categories of sport activities depend on the nature of the visitor and the visit, which is based on the consumer's motivations. However it should be noted that the model (as illustrated in Figure 1) takes no account of repeat visits, age and experience over time. Thus, the typology of the sport and tourism are differing at different times (Gammon and Robinson, 2003).

Figure 1 - A Consumer Classification of Sport and Tourism.

SPORT and TOURISM

Sport Tourism   *Tourism Sport*

Hard definition   soft definition   soft definition   hard definition

| Passive or active participations at a competitive sporting event | Primarily active recreational participation in sport | Visitors who engage in some minor form of sport or leisure; their participation is purely incidental | Tourists who as a secondary reinforcement passively or actively participate in sport |

Examples: Examples: Examples: Examples:
- Olympic Games   - Hiking   - Mini-golf   - Sport cruises
- Soccer matches   - Canoeing   - Swimming   - Health & Fitness
clubs

Source: Gammon and Robinson (2003)

Furthermore, Thwaites (1999) suggested the characteristics of the sport tourism from both the demand side and supply side. From the supply aspects, the sport tourism is multisectoral and the nature of the product is complex as it represents a mixture of various elements; the highly fragmented supply, in where the businesses may contribute to the overall experience; certain aspect of the sports' product are intangible (Service cannot be seen and touch), inseparability (production and performance cannot be separated and must occurred in the same time), and perishability (services cannot be stored for the next time uses, e.g. ticket to watch the sports events cannot be stored for next games). From the demand aspect, the sport products are highly elasticity; seasonality; changing needs; attitudes and preferences of customers with little brand loyalty; and heterogeneous customer groupings e.g. each customer will have different needs and wants towards the sport events (Thwaites, 1999). Likewise, Turco (2000) has identified several characteristics of the sport tourism, as the following:
-   short duration;
-   high concentration of athletes (participant) and spectators;
-   extensive media coverage;
-   multiple venues, concurrent sessions;
-   uncertainty of contestants, outcomes.

CLASSIFYING SPORT TOURISM

There are a number of ways to classify the sport tourism. One of the approaches is introduced by Gibson (1998a; 1998b & 1998c). Fundamentally, he suggested that there are three major types of sport tourism: "Active sport tourism", "Event sport tourism" and "Nostalgia tourism". As explained by Gibson, active sport tourism refers to the participation in the sport activities away from home environment. Additionally, he had established several characteristics of the active sport tourists, which are likely to be male, affluent individuals, college educated, willing to travel long distances to participate in their favorite sports, likely to engage in active sport tourism well into retirement, and they tend to engage in repeated activity.

The Active sport vacations can be further divided into 3 major types, as mentioned by. The first type is "Pure sport Holiday", where the primary purpose of travel is to take part in sports activities or contests. The second type is "Vacation", where participating in sport is not the primary purpose yet they are making use of the sports facilities. The third type of active sport vacations is "Private sporting holiday", where people take part in informal games such as beach volleyball (Gibson, 1999). Furthermore, the Active Sport tourists could be subdivided into "Activity participants" and "Hobbyists". Activity participants refer to persons that engage in sport related travel as a form of leisure, while hobbyists are the amateur 'players' that travel to take part in competitions in their chosen sports (Gibson, 1998b; & 1998c).

Meanwhile, Events sport tourism is a phenomenon where people are traveling away from their usual environment to watch sporting events (Gibson, 1998a; 1998b; & 1998c). These spectators are normally being included in the sport tourism even though they are only passively involved in the events. In contrast, Nostalgia sport tourism is being described as a type of travel to visit sports halls such as the basketball Hall of Fame in

Springfield, Massachusetts, sports museums, and other famous sporting venues. In other words, the nostalgia sport tourism refers to the people's intention to watch or experience the famous sporting venues such as the architecture of the sports hall of fame and sport museums, which can help them to retrieve back their old memories.

The next approach can be found in literatures written by Gee, Makens, & Choy (1997) and Gibson (1998b) encompassing attractions, resorts, cruises, tours, and events associated with sports and recreation. The following are the definitions on these sport tourism categories:

Sports Tourism Attractions
Sports tourism attractions refer to those attractions that providing "energizing power" with sports related physical activities as their principle focus. This kind of attractions is usually on-location in places within regions, countryside or urban setting, which can provide the tourists things to see and do, where the personal and social expectations could be in varying degrees. The attractions could be natural or man-made such as sport museum; state-of-the-art sport facilities: stadiums, arena, bowl, etc.; hall walls of fame. (Examples in Table 1)

Sports Tourism Resorts
Sports tourism resorts represent well-planned and integrated resort complexes or villas with sports as their primary focus and marketing strategy. Normally, these vacation centers have high standard facilities and services available to the sport tourist. Some of these resort sites focus on specific, highly developed skills, while some cater for the recreational sporting activities. (Examples in Table 1)

Sports Tourism Cruises
Sports tourism cruises refer to the boat trips that have sports or sporting activities as their principal market strategy. General characteristics of the sport tourism cruises include: special transportation for tourists from one land location to another providing opportunities to involve in sport activities; high profile of sports personalities on board sharing discussions, and coaching opportunities for the tourists Sports conference (seminar and special sessions) may also being hosted on board. (Examples in Table 1)

Sports Tourism Tours
Sports tourism tours refer to the companies that utilizing the sporting activities as their primary focus in arranging tours and touring venues. General characteristics of the sport tourism tours consist of: specific visitations to one or more sport attractions over a specified number of days (sport theme park, sport museum, etc.); combined visits to sports attractions and major sports events (heritage sites, walls of fame and sports events); attendance at a specific number of major sports events (professional basketball and golf, in one or more locations); participation in conferences, workshops, clinics, forums, and attendance at major sports events; tours related to the natural characteristics or setting pursued by tourists for aesthetical and / or physical reasons (trekking, regatta, mountain climbing). In essence, the tourists that involved in this category can be classified as "novelty seekers" and "explorers" as they are seeking for authenticity and the quality of sport tourism experience. (Examples in Table 1)

Sports Tourism Events
Sports tourism events refer to those sports activities that are attracting a large percentage of sport spectators. Furthermore, it has the potential to attract non-resident media, technical personnel, athletes, coaches and other sports officials. The distinctions of the sport tourism events are - the tourists are travel to see the sport activities or games; and the tourists are actively participating in the spots activities, whether formally planned or informally organized. (Examples in Table 1)

Table 1 – Examples of the Categories of Sport Tourism

Attraction	*Resort*	*Cruises*	*Tours*	*Events*
Sports museums/ Hall of frame	Sports conference	Sports/celebrity cruises	Facility/sites event tours	Regional/national/int. sport events
Stadiums/arena	Training/Sports camps	Sports attractions visitations	Sports adventure tours	Regattas
Golf courses	Ski resorts	Fishing cruises	Cycle/walking tours	Marathons

Source: Adapted from Tourism Sport International Council 1991, Canada. (Cited in Gee, Makens, & Choy, 1997)

Other than the two approaches described above, the sport tourism can be classified according to its various settings. Essentially, the sport tourism activities could take place in urban and non-urban settings, indoors or outdoors, in all types of climatic conditions and in all settings. Different settings within sports tourism can be classified according to situational locale of the experience and may be identified based on:

(a) "Cultural setting" - where some elements of the sports activities are consists of cultural elements, such as regatta.
(b) "Natural setting" - where the sport events are being conducted in the natural environment, such as mountain climbing, canoeing, and rafting.
(c) "Man-made" setting - where the sport activities are being conducted using the man-made sport infrastructures or facilities, such as stadium, buildings and sport museum.
(d) "Social setting" - where the involvement of the tourists in the sport activities is just for fun, excitement, experience, without any economic benefits.
(e) "Economic setting" - where the sport tourists' involvement in the sports events is for some economic returns. For example, the professional athletes will gain an economic reward if he or she represents his or her own country to participate in the game.

According to Gibson (1998a; 1998b & 1998c), there are two major types of sport tourism available in Sarawak – active sport tourism and event sport tourism. There are various sport facilities built for the locals and also visitors that can support these two types of sport tourism. There are available a sports complex complete with an indoor stadium, an astroturf field and an Olympic sized swimming pool. Other major sport facilities, which can be found in the state including State Football Stadium, Sarawak State Stadium (Indoor Stadium) and a number of world class golf courses. The State Hockey Stadium was officially declared open on June 30 1991 with a capacity of about 1000 spectators. Additionally, a new outdoor stadium (Stadium Sarawak) with seating capacity of 40,000 spectators was built in 1997. The sport facilities include football pitch and–lane synthetic running track as well as other ancillary facilities such as meeting hall and conference rooms.

Variety of special events and festival were organized to attract visitors all year around. Some of the sport events had even established their reputations and are being organized as annual events such as Kapit Balleh Raft Safari, Sarawak Regatta, Borneo Cup Motocross Championship, and Lambir Rainforest Challenge because of tremendous support from the locals and tourists, both locally and abroad. In summary, Sarawak has successfully put together huge efforts to cater various needs and requirements of the Active sport tourists and Event sport tourists. In contrast, Nostalgia sport tourism is a concept of tourism that has yet to be introduced in Sarawak.

Sarawak has several established sports events every year like the ITF World Junior Tennis Circuit, several regattas and nature challenges. From year to year, new and more events and festivals are being introduced and staged by both profitable and non-profitable organizations. Other than that, Sarawak may need to start increase its international events or expand the presents events internationally. In the category of sport attractions, the most popular attraction in Sarawak is its golf courses. Still, Sarawak need to come up with new ideas of sport attractions that can be popularized for tourists, such as sports museums and wall/cave climbing. The available stadiums/arenas need to be managed and marketed strategically. While strengthening its events and attractions, Sarawak can begin developing other categories of sport tourism for the tourists like sports resorts, cruises and tours.

Generally, sport tourism in Sarawak has taken place in various settings - urban and non-urban settings, indoors and outdoors, nature and man-made settings. There were sports events that based on nature (ecosports) and adventure and carried out mostly in natural setting such as Sarawak Similajau Nature Challenge, Borneo Mountain Bike festival, Sarawak Regatta and Sarawak Kubah Serapi International Run. There were also professional sports events like ITF World JR Tennis Circuit, Sarawak International Triathlon and Sarawak JR World Masters Golf Championship. Even the cultural festivals in Sarawak are also incorporating some kind of culturally sport competitions or contest as part of the agenda.

It is no doubt that Sarawak has incredible geographical diversity especially the natural surrounding or environment. The land of Sarawak is richly stream with wonders of the natural world. Two thirds of Sarawak is covered in rich green vegetation, mainly ancient rainforest. The network of rivers as well as the wonderful mountain range has enabled many sporting activities to be carried out. Most of the water-based sports have been carried out in national parks and these natural parks will be the most suitable place for the adventurous to pursue an adventure experience. Each year few of the rivers have become the routes for raft safaris events. Apart from rafting, the natural resources will also facilitate many others sporting activities such as mountain climbing, mountain biking, wall climbing, water skiing, yachting and many others.

SPORT TOURISTS – CONSUMER BEHAVIOR

Generally, a person will be considered as a sport tourist if their primary purpose of travel is to actively participating in or viewing the sport events (Turco, 2000). To be specific, the sport tourist is defined as a

temporary visitor that stay at least 24 hours in the destination visited with the purpose to attend the sport-related events (Commonwealth, 2000).

Collectively, the sport tourists can be divided into two categories, "Domestic sport tourists" and "International sport tourists". According to Commonwealth (2000), domestic sport tourism refers to any sport-related trip that is being taken 40 km away from home and involves at least one night stay. On the contrary, an international sport tourism refers to any sports-related trip that involve travel to other country with a primary purpose to participate in a sporting activity, either as a spectator, participant or official (Commonwealth, 2000). Using the case of 2004 Olympic Games in Athens, Karlis (2003) has tried to categorize the international tourists into three categories: visitors before the games (members of the International Olympic Family, sponsors, media, athletes, and spectators); visitors or spectators of the games (when the games are being held); visitors that are attached to the country due to the publicity (foreign tourists). Apart from the sport tourist, there is another type of sport consumer, which is called "Sport excursionists". Sport excursionists are day-trippers for a sporting event, which necessarily means they do not spend a night on the destinations (Gibson, Willming and Holdnak, 2003; Commonwealth, 2000)

The sport tourists can be further categorized to "Sport spectators" and "Sport participants". Each of them has their own characteristics. Shank (1999) has described the spectators as a consumer who derives their benefit from the observation of the event or watches the events. Meanwhile, the participants are the consumer that becomes actively participated in a variety of sports at a variety of competitive levels (Shank, 1999). Likewise, Pitts (1997, cited in Commonwealth, 2000) has clarified that the sport tourism consists of two broad categories from a sport marketing and sport management perspective, which are:
- Sports participation travel - travel to participate in the sport, leisure, recreation or fitness activities); and
- Sports Spectatorial travel - travel to spectacle the sport, leisure, recreation or fitness activities or events.

In addition, each of the sport tourists has their own objectives to achieve for their involvement in the sport activities or events, depending on their role whether as a participant or spectator. To the athlete-participant, the mastery of the body in particular skill development is implicitly essential. A participant with high level of commitment and team identification will gain eight durable benefits from the games: self actualization, self enrichment, self expression, renewal of self, feelings of accomplishment, enhancement of self image, sense of belongingness and social interaction, lasting physical products as a result of participation, and pure fun (Gibson, Willming and Holdnak, 2002). To the spectators, the degree of skill perfection and discipline demonstrated by the athlete becomes a symbol of perfection, admiration and success. However, these universal needs will be experienced differently and in various measures due to their intellectual, emotional, psychological, and social or other.

Table 2 - Reasons People Participate In Sport

Personal improvement
- Release of tension/relaxation,
- Sense of accomplishment,
- Skill mastery,
- Improved health and fitness,
- Other people's respect for one's athletic skill,
- Release of aggression,
- Enjoyment of risk taking,
- Personal growth,
- Development of positive values,
- Sense of personal pride.

Sport appreciation
- Enjoyment of the game
- Sport competition
- Thrill of victory

Social facilitation
- Time spent with close friends or family
- Sense of being part of a group

Source: Milne, Sutton, and McDonald (1996, cited in Shank, 1999)

Initially, there are several reasons why people participate in the sports activities/events. As Loy *et. al*., (1989) stated, the mass participation in many sporting events is due to a wide range of reasons including fitness, social contact, health performance, dedication to excellence, and in some cases, livelihood (cited in Higham & Hinch, 2002). Specifically, a study by Milne, Sutton, & McDonald (1996) has suggested that there are three basic reasons for people to participate in the sports as noted in Table 2 (cited in Shank, 1999).

Other than personal factors, there are also some other factors that would influence the game attendance. According to Shank (1999), games attractiveness, economic factors, competitive factors, and demographic factors could also affecting the spectators' decision to attend certain sporting events. Games attractiveness is a situational factor that will vary from game to game and week to week depending on individual's perception or expectation towards the events. Basically, the more attractive the game, the more likely attendance will increase (Shank, 1999).

Both the controllable and uncontrollable economic factors could also impact the game attendance. The controllable economic factors include aspects of the sports marketing environment, which can be altered by the marketers, such as the ticket price (Shank, 1999). The uncontrollable economic factors are things such as the average income of the population and the economic well being of the destination (Shank, 1999). The greater the perceived value and the higher the income of the population will lead to greater game attendance (Shank, 1999).

The competitive factors can be either sources of a direct competition (other sport) or indirect competition (other forms of entertainment). Simply, the lesser the competition for the spectator's time and money, the more likely the game attendance will increase (Shank, 1999). Other than that Shank (1999) also had stressed that the demographic variables such as age, gender, education, and ethnic background could also influence the game attendance.

As it can be seen, tourists today are looking for an extra value or benefit when choosing certain travel destinations or attractions. The tourists nowadays prefer to do things they have never done before, desire to visit to new places, travel healthy, have a direct travel experience, have multi-activity trips, accomplish something when they go on vacation. This change of preferences may results from today's improved education and/or modern technological advances. Essentially, the sport tourism could help or boost the tourists to accomplish all their wants and aims during their touring.

SPORTS POTENTIAL IN SARAWAK – THE SURVEY

To determine the potential of Sarawak a sport-based tourism destination in the future, a preliminary survey of tourists' perceptions, interests and behaviors towards the sport-related activities or events in Sarawak was undertaken. A sample of 100 tourists, who have been staying at least one night in Sarawak, was chosen conveniently at several popular tourist locations such as resorts, hotels and airports.

Table 3 - Socio-Demographic of Respondents

Origin	Percentage	Gender	Percentage
Peninsular	58	Male	39
Sabah	14	Female	61
Foreign	28		

Age	Percentage		
Below 20 years	9		
20 – 39 years	65		
40 – 50 years	25		
Above 50 years	1		

As shown in Table 3, Sarawak's tourists market consisted of domestic tourists from Peninsular Malaysia (58%) and Sabah (14%), and the rest were from international market (28%). Among the originating countries of the international tourists were England (21%), Singapore (18%), followed by USA, Japan, Indonesia, Thailand, Australia, Holland, Norway, Scotland, and South Africa. High percentage of the sample was male (61%). Majority of the sample were between 20 to 39 years old (65%) and 40 to 50 years old (25%). Thus through the survey, it could be established that Sarawak attracts younger market of tourists, which may be a good prospective for the sport tourism.

The survey has found several main reasons why the tourists chose to visit Sarawak. The most reason supplied by the tourists was the most basic and conventional touristic experience, sightseeing (27%). Other reasons given

were education (24%), business (19%), and visiting friends and relatives (VFR) (15%). Only a small number of 3% of the survey was reported visited Sarawak with primary motive related to the sport activities/events or in another term "Sport tourism". Thus, Sarawak presently is succeeded to attract only a small portion of sport tourists.

However, Sarawak still has prospect to develop its sport tourism sector. This is because the survey has revealed that even though their main motive of visiting Sarawak was not sport tourism, 25% had disclosed that they have in fact observed or even participated in some kind of sport activities/events during their traveling in Sarawak. Thus, they can be categorized under "Tourism sport" with the holiday or visit as the prime motivational reason for their traveling. And as expected, most people from this group were young and educated male. In contrast, the rest of the sample (74%) had stated that their tight traveling schedule played an important role in deterring them from involving in any sport-related activities/events.

In addition, the tourists were actually interested to be involved in sport tourism. 23% of the survey admitted that they were very interested to participate or watch sport-related activities or events, and a high 52% was somewhat interested, which is still can be managed to be persuaded to joint in or at least only as spectators of a game or championship. It is left only 25% of the tourist market confirmed that there were of conventional group of tourists and not interested in anything related to sports. Hence, Sarawak needs to develop and market more and higher quality of sport tourism's attractions, activities and events in order to attract the 75% of the potential "sport tourists" and also "tourist sports" in the market.

Similar to Milne, Sutton, and McDonald (1996, cited in Shank, 1999), the survey also discovered a few factors that may motivate the tourists to be involved in the sports activities/events. A huge motivation factor stated by the respondents was the benefit of releasing their tension while playing or observing games. The second most important reason for them to participate in sports was of health and fitness well being. It is a fact that sports and exercises are very good for our healthy body. The third most reason mentioned by the respondents was the enjoyment and experience of good time during the activities/events.

To conclude the survey, the respondents were asked of their opinion whether sport tourism has a future as one of popular tourism attractions in Sarawak or not. Results from the respondents were very encouraging towards the future of sport tourism sector in Sarawak. High 76% of the survey approved that Sarawak has a potential in developing sport tourism sector, and consequently able to attract popular attention from the tourists market.

Significantly, this is because Sarawak has abundant of geographical natural resources. Most part of Sarawak is covered with tropical rainforest and natural wonders. It possesses plentiful networks of rivers, limestone caves and mountains. For that reason, the respondents pointed out that there were three types of sports they found most attractive in Sarawak, which are adventure-based sports, sea or river-based sports and golfing. Thus, it may be best for Sarawak to concentrate on expanding activities or events along the line of these sports.

CONCLUSION

Sport tourism is one of the fastest growing segments in the tourism industry. Nowadays, many nations have starting to develop sport as a major tourism product after realizing the apparent significance that had been generated by the sport industry, which can contribute to the tourism industry (Noel, 2001). There is a growing demand for active vacations that associate with sport and physical activities. Significantly, the demands and behaviors of today's travelers have gone through some considerable changes. Hence, the concept of sport tourism in the tourism industry has becoming more prominent in the last few years both as an academic field and an increasingly popular tourism product (Gibson, 1998a).

Sarawak too has started to develop and market this new tourism sector. A number of sports events and activities have been planned and staged since past years. Many sport facilities and infrastructures were built for the public. Moreover, Sarawak possesses the necessary natural resources that can accommodate various types of popular sport-related activities and events.

Interests and pursuits in sports has become one of the attractions that can motivate people to travel, both local and foreign tourists. Consequently, the sport activities and events can bring various benefits to Sarawak's economics and tourism industry. Additionally, it is reported that the sport tourism are being staged because reasons of recreation or socialization, culture or education, tourism, internal revenue generation, natural resources, agriculture, external revenue generation, and community pride or spirit (Turco & Lee, 1996).

Fundamentally, "sport tourism" can be defined as the a phenomenon where people travel away from their usual environment to be involve in either competitive or non-competitive sport-related activities/events for fun, recreation or rewards. It is also described as a special kind of leisure, which involved challenge, excitement, involvement, community building, and satisfaction (Kelly & Freysinger, 2000). Moreover, it is also interpreted as a cultural experience of the physical activity and challenge. And for the purpose of simplification, sport tourism can be classified in a number of ways. In addition, the sport tourists and their behaviors are also discussed for further understanding.

In conclusion, the survey supported the potential of Sarawak as one of the celebrated sport tourism destinations. Even though for the time being Sarawak only succeeded in attracting a small percentage of sport tourists, Sarawak still has big prospect in developing and marketing the new sector to the global tourism market. 25% of non-sport tourists admitted to be involved in sport-related activities and events during their visitation albeit their major reason going to Sarawak is sightseeing or other than related to sports. Furthermore, 75% of the survey revealed of their interest to either participate or observe sports-based activities/events. Thus, they can surely be persuaded and promoted to joint in the sport tourism activities/events coupled with desirable circumstances. Essentially, a high 76% of the survey believed sport tourism can be a popular tourist attraction in Sarawak.

REFERENCES

Bull, A. (1995). *The Economics of Travel & Tourism*. Australia: Longman.

Commonwealth (2000). "Towards a National Sport tourism Strategy". (Online). Retrieved July 29, 2003 from World Wide Web: http://www.tourism.gov.au

Cannon, T.F., & J. Ford. (2002). "Relationship of Demographic & Trip Characteristics to Visitor Spending: An Analysis of Sports Travel Visitors across Time". *Journal of Tourism Economics*, 8(3), pp. 263-271.

Cook, R.A., L.J. Yale & J.J. Marqua. (1999). *Tourism: The Business of Travel*. New Jersey: Prentice-Hall.

Foster, D.L. (1991). *The Business of Travel: Agency Operations and Administration*. Ohio: Glencoe/McGraw-Hill.

Games BID (2002). "Study Projects Economic Benefits of 2010 Games Bid". (Online). Retrieved June 18, 2003 from *World Wide Web: http://www2.news.gov.bc.ca/nrm_news_releases/2002OTP0038-000709.htm*

Gammon, S. (2003). "The Dissemination of Sport tourism: Spreading the word". *Journal of Sport Tourism*, 8(1), pp. 7-8.

Gammon, S. & T. Robinson (2003). "Sport & Tourism: A Conceptual Framework". *Journal of Sport Tourism*, 8(1), pp. 2-26.

Garcia, B. (2001). "Enhancing Sport Marketing Through Cultural & Arts Programs: Lessons from the Sydney 2000 Olympic Arts Festivals". *Sport Management Review*, 4, pp. 193-219.

Gee, C.Y., J.C. Makens & D.J.L. Choy. (1997). *The Travel Industry*. Canada: Wiley.

Gelan, A. (2003). "Local Economic Impacts: The British Open". *Annals of Tourism Research*, 30(2), pp. 406-425.

Gibson, H.J., C. Willming & A. Holdnak. (2003). "Small-Scale Event Sport Tourism: Fans as Tourist". *Tourism Management*, 24, pp. 181-190.

Gibson, H.J., C. Willming & A. Holdnak. (2002). "We're Gators…. not just Gator Fans": Serious Leisure & University of Florida football". *Journal of Leisure Research*, 34(4), pp. 397-426.

Gibson, H.J. (1999). "Sport Tourism: The Rules of the Games". *Parks & Recreation*, Jun, 34(6); pp. 36.

Gibson, H.J. (1998a). "The Wide World of Sport Tourism". *Parks & Recreation*, September, 33(9); pp. 108-115.

Gibson, H.J. (1998b). "Sport Tourism: A Critical Analysis of Research". *Sport Management Review*, November, 1, pp. 45-6.

Gibson, H.J. (1998c). "Active Sport tourism: Who Participates?" *Leisure Studies*, 17(2), 155-170.

Higham, J. & T. Hinch. (2002). "Tourism, Sport & Seasons: The Challenges & Potential of Overcoming Seasonality in the Sport and Tourism Sectors". *Tourism management*, 23, pp. 17- 185.

Jago, L. (2003). "Sport Tourism in Australia". *Journal of Sport Tourism*, 8(1), pp. 7-8.

Karlis, G. (2003). "City & Sport Marketing Strategy: The Case of Athens 2004". *The Sport Journal*, Vol.6 (2).

Kelly, J. (2000). "Looking to Sports for Development Dollars". *American City & Country*, October, 15(4); pp. 20.

Kelly, J.R. & V.J. Freysinger. (2000). *21st Century Leisure; Current Issues*. Needham Heights, MA: Allyn & Bacon.

Khairul, A.M. (2003). "Proton Provides 260 Vehicles for LTDL". (2003, January 18). *New Straits Times-Management Times*.

Matheson, V.A. (2002). "Upon further Review: An Examination of Sporting Event Economic Impact Studies". *The Sport Journal,* Vol 5(2).

McDonnell, I., J. Allen & W. O'Toole. (1999). *Festival & Special Event Management*. Australia: John Wiley & Sons.

Mohd, A. (1999). "Ministry's Shift in Focus to Sports Tourism". (1999, June 08). *New Straits Times-Management Times*.

Mules, T. (1998). Events Tourism & Economic Development in Australian. In Tyler, D., & Guerrier, Y., & Robertson, M. (eds.), *Managing Tourism in Cities; Policy, Process & Practice*. England: Wiley.

Musa, G. (2000). Tourism in Malaysia. In Hall, C.M., & Page, S. (eds.), *Tourism in South & South east Asia: Issues & Cases*. Oxford: Butterworth-Heinemann.

Noel, C. (2001). "Destinations". *Travel Agent,* 304(4), pp. 50.

Shank, M.D. (1999). *Sports Marketing: A Strategic Perspective*. New Jersey: Prentice-Hall.

Shilbury, D. (2000). "Considering Future Sport Delivery Systems". *Sport Management Review*, 3, pp. 199-221.

Thwaites, D. (1999). "Closing the Gaps: Service Quality in Sport Tourism". *Journal of Services Marketing*, 13(6), pp. 500-516.

Thomas, G. (2000). "F1 Grand Prix Revs Malaysia's Tourism Engine". (Online). Retrieved June 25, 2003 from *World Wide Web: http://www.worldroom.com/pages/wrnkl/converstory4.phtml*.

Turco, D.M. (2000). "Going for the Gold: Sport Tourism Trends in United States, 1990-2000". (Online). Retrieved August 6, 2003 from *World Wide Web: http://www.prr.msu.edu/trends2000/pdf/turcosport2.pdf*

Turco, D.M. & K. Lee. (1996). "Festival & Special Event Research: Are We Having Fun yet?" *Parks & Recreation*, April, 31(4), pp. 24.

Waitt, G. (2003). "Social Impacts of the Sydney Olympics". *Annals of Tourism Research*, 30(1), pp. 194-215.

Zorba, E., H. Mollaogullari, F. Akcakoyun, F. Konukman & A. Teki. (2003). "The Examination of Sports, Recreation & Animation Activities of Selected Lodging Types on Service Sales in Turkey". *Journal of Sport Management*, 8(1), pp. 48-56.

Factors that Influence Japanese Outbound
Travel to Malaysia in the Contemporary Environment: An Empirical Analysis

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ABSTRACT

The tourism industry has been a catalyst to our nation's economic growth. The contribution to our nation's Gross Domestic Product (GDP) is undeniable. However, due to recent global unrests, the performance of this industry has since switched to a lower gear. Therefore, the Malaysian Government has put intensive effort to encourage the outbound arrivals. Japan is one of the largest tourism generating market in Malaysia, other than Asian country (Singapore, Thailand, Indonesia and Brunei). A percentage of Japanese arrival has increase from 286,940 million in 1999 to 354,563 in 2003 and the tourist receipt from this country increase by 4.0 percent in 1995 to 2000. Thus, this paper attempts to study the factors that influence Japanese outbound travel to Malaysia in the contemporary environment. We take the number of Japanese arrivals to Malaysia as a proxy. The dependent variable used are Gross Net Product (GNP), exchange rate, price of tourism and contemporary environment as a dummy variable.

INTRODUCTION

The tourism industry has been a catalyst to Malaysia's economic growth since 1990's. Being a key component of the service sector, its contribution to our nation's GDP is undeniable (Laporan Ekonomi, various years) thus it is not surprising that untiring efforts have been taken by our government in promoting the tourism industry to both local and foreigners.

Based on the statistics report from Malaysia Tourism Promotion Board, other than the ASEAN countries, namely Singapore, Thailand, Indonesia and Brunei, Japan is the largest tourist generating market in Malaysia until year 2000. Beginning from 2001, the number of japanese tourists to Malaysia has lagged behind China. (For details, please refer Table 1: Tourist Arrivals To Malaysia From Selected Market)

Table 1:Tourist Arrivals To Malaysia From Selected Market 1999 -2003

Country of Residence	January		December		
	1999	2000	2001	2002	2003
SINGAPORE	4,900,084	5,420,200	6,951,594	7,547,761	5,922,306
THAILAND	498,578	940,215	1,018,797	1,166,937	1,152,296
INDONESIA	307,373	545,051	777,449	769,128	621,651
BRUNEI	187,704	195,059	309,529	256,952	215,634
CHINA	190,851	425,246	453,246	557,647	350,597
JAPAN	286,940	455,981	397,639	354,563	213,527

Source: www.tourism.gov.my

The question is what are the factors that alter this trend? To answer this question, a study that aims to investigate factors that influence the Japanese outbound tourists to Malaysia in this contemporary environment is in time. Therefore, this paper attempts to examine the factors that influence the Japanese outbound to Malaysia. Besides it also measure the sensitivity level (elasticity) of Japanese tourists to those factors and we have included the global negative shocks such as the outbreak of SARS, Iraq War as dummy variable in this paper.

This paper is organised as follows: Part II presents the overview of japanese outbound tourists to Malaysia. This followed by the literature review. Part IV discusses about the methodology and empirical results respectively and Part V provides the conclusion and some policy implications.

OVERVIEW OF JAPANESE TOURIST TO MALAYSIA

The Japanese outbound holidays were liberalized in 1964. With the introduction of the Ten Million Programmed (10MP) by Japan's Ministry of Transport, the international outbound become popular to Japanese. Japanese representation in the international tourism market has been steadily increasing and contributed to the economic growth and level of expenditure to the country. Despite of the recent economic recession, Japanese outbound does not have much negative effect, as overseas travel has been widely popularized.

The Japanese Tourism Board Foundation reported that Japanese tourist motivation has change from for the 'sake of travel' to that of 'specific objectives'. The Japanese travelers seem to be very eager to acquire new knowledge and to enjoy adventure through overseas travel. The nature and scenery, historical sites and architecture, local cuisine and favorite foods, rest and relaxation, shopping, different experience, art galleries and museums, meet local people, water sports and knowledge are the preferences of Japanese travelers. However, demographic factors such as gender, age and marital status will have an effect on these motivation. (David, 2001)

In effort to boost the Malaysian tourism industry, the government has allocated a RM1 billion development expenditure over the next five years under the Eight Malaysia Plan, 2001-2005. An intensive promotion, advertising, campaign and information dissemination have been done to encourage more tourist travel especially from Japan. In this regard, aggressive promotional activities were carried out under the theme of "Malaysia Truly Asia" to promote the unique blend of natural beauty and a rich diversity of culture, traditions, history and lifestyles of the various ethnics in Malaysia. This is one of the motivation factors for Japanese to visit Malaysia. (Eight Malaysia Plan, 2001)

Furthermore, the Malaysian tourism product such as hill and island resort, shopping destination, thematic events, sports and recreation tourism, cruise tourism, eco-tourism, cultural and heritage tourism are attract Japanese travelers to Malaysia. The event such as Colours of Malaysia, Merdeka celebration, Festival celebration such as Hari Raya Aidiladha, Deepavali, Thaipusam, Christmas and Chinese New Year are a new experience for them. In other words, cultural curiosity would be the most influence factor for Japanese to visit Malaysia. With the rapid improvement and construction in the transportation system have provide an easier access to tourist destination. It has encouraged the tourist to travel more. Hence, "word of mouth" effect make the Japanese tourist visit Malaysia either for vacation, holiday, meeting or business travel.

Other than that, Malaysia can provide the new and unusual experience for Japanese while visiting Malaysia. This country has different culture and makes them fell escape from daily life. A multiracial nation, religion and variety of festival and food but live in harmony is one of the influence factor why Japanese visit Malaysia. It known as one of motivated factor for Japanese to have outbound holiday.

The general attitudes will have some effect on have vacation of Japanese. The studies done by David (2001) found that Japanese attitude towards taking outbound holiday is becoming more positive and overseas holiday is treated as a status symbol.

A destination's image may be based upon ideas and impressions that the prospective traveler holds about the destination and therefore may influence tourist motivation. It will be a positive image and then attract Japanese to travel or a negative image. A health concern is one of the hindering factors for Japanese travelers to Malaysia. The SARS epidemics has lower the Japanese arrival to Malaysia by 59.7 percent to only 8,706 in April 2004.

Other than that, a concern of security is a most important factor for Japanese to have vacation. It could be said that Japanese think that being abroad would be unsafe compared to staying in Japan. According terrorism problem, arrivals from Japan has drop by 49.5 percent to 13,310 in October 2001. This is because Asian country including Malaysia has been mark as terrorist place. This issue make Japanese tourist fear of flying and then reduce the number of arrivals for vacation, holiday, visiting and business trip to Malaysia.

The study found that Japanese are likely to consider "time" as a hindrance when regarding going on a holiday abroad. That may be the reason why Japanese have short stay and prefer to have package tour. The reason for this contradiction could be cultural because the Japanese tend to be workaholics and they urged to work by feeling guilty taking time off when their colleagues are working. Therefore, the Japanese tend to avoid taking holiday and find it is difficult to take holiday even though they afford to do so.

The Japanese Tourism Board have listed the hindering factors of overseas travel by Japanese which is security concerns, language concern, higher cost, food, anxiety about health, fear of flying, dislike foreign travel, cannot take time off, need to take care family, tiresome travel application procedure, do not agree with foreign custom like tipping and corrupt and overseas travel is extravagant.

LITERATURE REVIEW

Based on the previous research, we found that only a number of studies focused on Japanese arrival in Singapore and British Columbia. For example Tak (1998) investigated the Japanese tourist arrivals in British Columbia and its implication. The author used tourist arrival as a proxy for tourism demand factor of income, relative price index, exchange rate and habit persistence. By using the Ordinary Least Square technique empirical result showed that income and habit persistence were significance while exchange rate not. The empirical results also potrayed that season have some significant effect on tourism demand.

David Gilbert (2001) studied the factors of Japanese tourism demand for the United Kingdom (UK). This studied found various cultural aspects of demand as well as the constrains and the push factors that motivate the Japanese to choose outbound holiday. It also found that UK's features such as culture, language and novelty are important pull factors.

In 2002, Tak ran quite similar research as 1998 but focused on the seasonal variation of Japanese tourist arrival in Singapore. The author used the ratio-to-moving average technique to obtained the 12 seasonal indices from 1985 to 1998 and found that Japanese tourist arrivals are stable over the time.

Christina (2002) studied the Portuguese inbound international tourism demand from five countries of origin namely France, Germany, The Netherlands, Spain and UK. In her study, she examined the long run relationship between the demand for holiday visits and the variables that affect holiday travel such as income, destination prices and travel cost by using Johansen cointegration analysis.

In 2003, Song examined the demand for Hong Kong tourism by using the Ordinary Least Square (OLS) method. The studies pointed out found that the most important factors determined the demand for Hong Kong tourism are the cost of tourism in Hong Kong, income in origin countries, the cost of tourism in the competing destinations and the 'word of mouth' effect.

Lim (2004) studied the major determinants of Korean outbound travel to Australia from 1980 to 1994. The seasonal tourist arrival was computed using the ratio-to-moving average technique and found that season have some influence on outbound travel from South Korean to Australia. It was noted that the peak was on January during the Lunar New Year Holiday and the lowest was on September. Furthermore, Ordinary Least Squares (OLS) technique was used to estimate the economic tourism demand variable and found that gross net product, exchange rate and relative price are significant.

Nicholas Distains (2004) done an empirical study of German and British tourism demand for Greece by using the cointegration analysis. The model used the tourist arrivals from origin country as a proxy of the real income percapita, tourism prices, transportation cost and exchange rate. The studies found that real income percapita, tourism prices, transportation cost and exchange rate are the determinants variable of tourism demand in Greece.

DATA

Based on the literature review, we have identified five most frequently used explanatory variables in tourism demand studies. They are Gross Domestic Product of Japan (proxied by Industrial Production Index (IPI) due to unavailability of montly data), the relative tourism price (that is the ratio of Consumer Price Index (CPI) of Japan to Consumer Price Index (CPI) of Malaysia), exchange rate, global negative shocks (NS) and seasonal effect (S). Whereas the Japanese tourists arrival (Y) has been determined as our dependent variables. It is a measure of Japanese confidence level for travelling to Malaysia. Thus, the Japanese confidence level for travelling or outbound Japanese tourists to Malaysia can be summarised as follows:

Y = f(IPI, TP, ER, NS, S)

In this paper, secondary data consisting of monthly data for IPI, CPI for both countries, exchange rate, global negative shocks and seasonal effect is used. IPI, CPI, exchange rate were obtained from various issues of International Financial Statistics Bulletin. For global negative shocks data, it is obtained from World Health of Organisation. We only took the diseases or disaster outbreak month because it is very hard for us to justify the

exact time that we freed from those negative shocks. The seasonal effect data is based on the information provided by a Japanese tourist. Both variables are dummies. The study period span from 1991:1 to 2003:10.

Model

As the objectives of this paper is to measure the sensitivity level (or elasticity in economics term) of Japanese outbound tourists to Malaysia in this contemporary environment, a log-linear Ordinary Least Square (OLS) model is employed. The OLS Model is expressed as below:

$$\ln Y_t = \gamma_0 + \gamma_1 \ln IPI_t + \gamma_2 \ln TP_t + \gamma_3 \ln ER_t + \gamma_4 \ln NS_t + \gamma_5 \ln S_t + \varepsilon_t$$

where Y_t is the logarithm of Japanese tourist arrival to Malaysia at time t; $\ln IPI_t$ the logarithm of Japanese Industrial Production Index at time t; $\ln TP_t$ is the logarithm of relative tourism prices; $\ln ER_t$ is the logarithm of exchange rate (Malaysian Ringgit per Yen) at time t; $\ln NS_t$ is the logarithm of global negative shocks and $\ln S_t$ is the logarithm of the seasonal effect. ε_t is the independently distributed random error. γ_0, γ_1, γ_2, γ_3, γ_4 and γ_5 are the parameters to be estimated.

RESULTS AND ANALYSIS

From the results, it is found that the coefficient for the variable LOG(JIPI) is positive and has significant impact on the number of Japanese tourist arrivals. Taking the Japanese Industrial Production Index (IPI) as a proxy to the Japanese income level, one can see from the coefficient of approximately 6.29 that when the Japanese IPI increases by 1%, then the number of Japanese tourist arrivals to Malaysia increases by 6.29%. This implies that the Japanese tourist arrivals are income- elastic.

As for the explanatory variable LOG(TP), it has a negative coefficient of approximately 3.31 and has significant impact on the number of Japanese tourist arrivals. The ratio of Malaysia's Consumer Price Index (CPI) over Japan's CPI is utilized to represent tourism price. From its negative coefficient, it means that as the cost of tourism in Malaysia increases by 1%, the number of Japanese tourist arrivals will drop by 3.31%. The phenomenon here follows basic demand theory and is price-elastic.

The variable LOG(ER) has a coefficient of approximately –2.76 and also has a significant impact on the number of Japanese tourist arrivals. The negative impact of the Malaysian-Japanese exchange rate shows that when the exchange rate increases in favour of the Malaysian currency, then the number of Japanese tourist arrivals will decrease.

Apart from the above-mentioned three significant variables, there are 2 variables which are found to have no significant impact on the number of Japanese tourist arrivals. The first insignificant variable is a dummy of global negative shocks, which include wars, terrorism acts and deadly epidemic. The second insignificant variable is a dummy of Japan's four climatic seasons. These global negative shocks and Japanese seasons are found not to have any significant impact on the number of Japanese tourist arrivals. Malaysia, as the host country is peaceful and has not, in any way, involved itself in any wars or political instability during the period of study. There are also just a few scattered incidents of epidemic cases in both countries and thus no need for much cause of alarm.

CONCLUSIONS AND POLICY IMPLICATIONS

From the observations made by scrutinizing the results, a few policy implications are suggested. The high income level of the Japanese (where here, the Japanese IPI is taken as a proxy) tourists is a welcoming news to Malaysia, as higher income indicates that the Japanese can now spend a larger proportion of their income on tourism activities. The Malaysian government should put more effort in promoting Malaysia as a tourist destination to the Japanese. The Malaysian government should go all out to sell its culture, which has a similar Asian flavour as those of the Japanese, its all-year round of warm climate, as opposed to Japan's changing four seasons and its relatively less costly products, to attract the Japanese tourists.

The Malaysian government, especially the Ministry of Tourism, Culture and Arts should make more conscious move to ensure that the cost of tourism in Malaysia does not inflate. Hotel rates, entrance fees, souvenirs' prices and the likes, have to be monitored closely especially during peak seasons, when the number of tourists are the most.

The exchange rate plays an important role in influencing the number of Japanese tourists arrivals to the Malaysian shore. In this case, an appreciation of yen may somewhat be looked upon as favourable. This is because if the yen appreciates, it indicates an increased purchasing power of the Japanese, thus the spending on tourism may indirectly increase too.

REFERENCES

Christine Lim. (2004). The Major Determinants of Korean Outbound Travel to Australia. *Mathematics and Computers Simulation* 64: 477-485.

David Gilbert & Mikiko Terrata. (2001). An Exploratory Study of Factors of Japanese Tourism Demand for the UK. *International Journal of Contemporary Hospitality Management* 13: 70-78.

Haiyan Song, Kevin K.F. Wong & Kaye. K.S. Chon. (2003). Modelling and Forecasting the Demand for Hong Kong Tourism. *International Journal of Hospitality Management* 22: 435-451.

Kathleen Carey. (1991). Estimation of Caribbean Tourism Demand: Issues in Measurement and Methodology. *Atlantic Economic Journal* 19: 32-40.

Malaysia. (2002). *Immigration Department of Malaysia Report 2002.* Kuala Lumpur.

Malaysia. (2002). *Department of Tourism Statistics.* Kuala Lumpur.

Malaysia. (2001). *Eight Malaysia Plan 2001-2005.* Kuala Lumpur.

Nikolaos Dritsakis. (2004). Cointegration Analysis of German and British Tourism Demand for Greece. *Tourism Management* 25: 111-119.

Stephen Morris. (1997). Japan: The Characteristics of the Inbound and Outbound Markets. In Frank M.Go & Carson L. Jenkins (ed.). *Tourism and Economic Development in Asia and Australasia,* pp. 150-175. London: A Cassel Imprint.

Tak-Kee Hui & Chi Ching Yuen. (1998). An Econometric Study on Japanese Tourist Arrivals in British Columbia and Its Implications. *The Service Industries Journal* 18: 38-50.

Tak-Kee Hui & Chi Ching Yuen. (2002). A Study in the Seasonal Variation of Japanese Tourist Arrivals in Singapore. *Tourism Management* 23: 127-131.

World Tourism Organization. (2001). *Tourism After 11 September 2001: Analysis, Remedial Actions and Prospects*, Madrid: World Tourism Organization.

Zainab Khalifah & Shaharuddin Tahir. (1997). Malaysia: Tourism in Perspective. In Frank M.Go & Carson L. Jenkins (ed.). *Tourism and Economic Development in Asia and Australasia,* pp. 150-175. London: A Cassel Imprint.

Foreign Direct Investment and Technology Transfer in Malaysia: A Re-Examination

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ABSTRACT

Foreign direct investment (FDI) has been a subject of interest in research for many years since it has become an important source of private foreign capital for both developed and developing countries. The size and nature of FDI throughout the world has gone through rapid changes over the years. According to the World Investment Report (2003), the overall inward FDI stock in 2002 has reached $7.1 trillion, 10 times more than in 1980. Although the impact of FDI on economic development is debatable, there are many empirical findings that support its positive contributions. Research has shown that FDI had positive impact on domestic investment, exports and economic growth in Malaysia. Developing countries are thus, competing to attract FDI into their economy. Even in Malaysia, FDI has been an important source of private capital since domestic investment was just not enough to sustain economic growth. However, one area that remains controversial is the impact of FDI on technology transfer. Evidences are still not conclusive as to the extent of technology being transferred by Multinational Corporations (MNCs). Thus, the main objective of this paper is to re-examine the impact of FDI on technology transfer. The contribution of FDI on technology transfer is still at the adoption and initial phase of the rooting stage. However, there are isolated cases where some Malaysian companies have led the way to develop our own home grown indigenous technologies. This was obtained through linkage, training and competition effects. Bu,t this success is not substantial despite being a major location for MNCs since the 80s. More effective policies are needed to promote technology transfer by MNCs .If not, Malaysia will end up reaching a "stagnant" level and our economic growth will continuously depend on importation of foreign technology and skills.

INTRODUCTION

Foreign direct investment (FDI) has been a subject of interest in research for many years since it has become an important source of private foreign capital for both developed and developing countries. Foreign direct investment is defined as investments made for the purpose of actively controlling or acquiring property, assets or companies located in host countries (Griffin & Pustay 1998). Those firms that engage in FDI are commonly known as Multinational Corporations (MNCs) or Transnational Corporations (TNCs).

The size and nature of FDI throughout the world has gone through rapid changes over the years. According to the World Investment Report (2003), the overall inward FDI stock in 2002 has reached $7.1 trillion, 10 times more than in 1980. From this total, $4.6 trillion was held in the developed world and half of that in the United States, Britain and Germany. $2.3 trillion was held in developing countries and from this amount, close to 60% was held in countries in South, East and South-East Asia.

One factor that has contributed to its rapid growth is the rise of globalisation. The emergence of globalisation has forced many MNCs to expand their businesses into newer markets, outside their own countries. Many of these MNCs are moving to emerging and stable markets such as South East Asia and Latin America. According to World Investment Report (2003), in 2002 the world's MNCs consisted of 64,000 parent firms and 250,000 foreign affiliates which accounted for two thirds of the world trade in goods and services. Another factor that boosted the growth of FDI is the role played by the World Trade Organisation. The rapid promotion of free trade through the gradual removal of trade barriers worldwide has prompted many MNCs to expand their businesses into newer and more attractive markets.

MALAYSIA'S ECONOMIC DEVELOPMENT AND FOREIGN DIRECT INVESTMENT EXPERIENCE

Malaysia has gone through a structural transformation, from a country depending highly on mineral and agriculture commodities to one emphasising on manufacturing industry. The manufacturing sector has also gone into another round of transformation by slowly shifting from labour intensive into capital-intensive industries. This transformation was unavoidable due to the rise in labour cost experienced rapidly in the early 90s.To encourage greater investment into the manufacturing sector, the government relied heavily on FDI. Domestic investment was just not enough for Malaysia to sustain economic growth.

Therefore, FDI has been an important source of private capital for Malaysia since then. FDI also contributed enormously to Malaysia's economic development since the mid 80s. Before 1980s, a lot of FDI flowed into the primary sectors such as plantations and mining sectors. However, the recession in the mid 80s, forced the government to diversify the economy by accelerating the growth of the manufacturing sector. This was the beginning of a new era in the Malaysian economy since it began attracting huge amounts of FDI in the manufacturing sector as well.

FDI flows are shown in Table 1 below. From 1985 to 2002 there has been an upward rise in FDI flows except for 1998 and 2001. In 1998, the Malaysian economy suffered from the financial crisis and this affected the flows of FDI significantly. In 2001, the rapid slowdown in FDI flows was due to the world wide economic recession (World Investment Report 2003). However the pattern of FDI flows into Malaysia was in tandem with the world FDI flows.

Table 1: Inward FDI Flows: 1985-2002(UNCTAD, World Investment Report for Malaysia 2003, p.1)

(US$m)

	85-95	98	99	2000	2001	2002
Malaysia	2902	2714	3895	3788	554	3202
World	180,901	686,028	1,079,083	1,392,957	823,825	651,188

As an economy becomes more developed and modern, the role of the service sector becomes more imperative and essential.The services sector has thus become a dominant contributor to gross domestic product (GDP) in many developed countries such as United States, Japan, Australia and Singapore (Clemes, Arifa & Gani 2003). This phenomenon is also taking place in emerging economies such as Malaysia. In 2002, services sector contributed 45.9% to the country's GDP as compared to the manufacturing sector that contributed 30.7 % only (MITI 2003). Empirical investigation by Clemes, Arifa & Gani (2003) in ASEAN countries, found that growth of the services sector has positive influence on the manufacturing sector and vice versa. In other words, there are two-way spill over effects between the services and manufacturing sectors.

FDI in services can be seen in the financial, transportation, telecommuniucation, shared services, information technology, education, health care etc. One area getting huge attention from foreign service players is the call centre industry. A lot of foreign call centres have been establishing their base in Malaysia. According to Stephen Shepherd, Kelly Services Regional Director for Sales and Operation (Asia Pacific), Malaysia is becoming an important contact centre hub and a better choice for global companies to locate their call centres (Business Times, 26 December 2002).

The Multimedia Super Corridor (MSC), the country's test bed for the development and application of sophisticated information technology is also a host to MNCs such as DHL, Alcatel Networks, Acterna, Shell IT, British American Tobacco, Scope International -Standard Chartered (Business Times, 23 April 2002). He further reiterated that many MNCs are even relocating their call centres from Singapore and the Philippines to Malaysia. Industries that are relying heavily in the contact centre services in the country are banking, telecommunications, insurance, transportation and logistics. According to the Asian Call Centre Industry Benchmark Study in 2003, Malaysia has about 575 contact centres and is placed at par with Singapore, Thailand and Hong Kong (The Star, BizWeek 4 October 2003 p.27) .

The emergence of MNCs throughout the world has brought huge positive and negative implications on economic growth and development of many developing economies. One area that has attracted huge research is the impact of FDI on technology transfer. It is argued that MNCs bring in superior technology and help and spread this technology

to local firms via linkages and employment. However, empirical evidences are still not conclusive. It is unclear whether technology transfer really takes place effectively.

RESEARCH OBJECTIVE

Although FDI has played an effective role as a source of financing to a lot of developing countries, its impact on economic development through technology transfer is still debatable. It is therefore, the aim of this paper to examine the impact of FDI on technology transfer in selected manufacturing and service MNCs in Malaysia. Emphasis will also be given on the channels for technology transfer from FDI. The inclusion of service MNCs in this research would provide valuable insights to the extent of technology transfer taking place in the services sector currently. This sector is poised to be the next engine of growth in the future.

WHAT THEORY SAYS?

Theories explaining impact of FDI can be traced back to the work of Karl Marx who wrote on its impact on development and underdevelopment. This early view came to be known as the dependency theory of FDI (Fan 2002). This school of thought which became hugely popular in the 70s and 80s, viewed FDI by MNCs from developed countries to developing countries as harmful in the long run (Cutter , u.d). It argued that FDI brings negative consequences to developing countries in the form of profit repatriation, declining reinvestment, lack of economic spin-off, technology transfer and worsening balance of payment situation. However, not all supported this view. Hymer (1976), one of the earliest to study the behaviour of MNCs disagreed and theorized that FDI can have positive contribution on economic development.

This brings us to the industrialization theory of FDI suggested by Hymer (1976). According to Hymer, FDI by MNCs does not only involve capital inflows but also international production. Therefore, developing countries receiving FDI benefit not only in terms of capital but new technology, management skills, marketing know-how and human capital (cited in Fan 2002).

This industrialization theory of Hymer has been also employed in a lot of research on technology spillover from FDI. Blomstrom and Kokko (2002) and Markusen (1998) call it the 'knowledge capital model' (KCM). According to them, there exist technological spillovers from MNCs to host countries through their subsidiaries since they own certain technological advantage.

However, these theories have been empirically tested and the results have been highly inconsistent. The next section will discuss some of the empirical findings on the impact of FDI on technology transfer.

FOREIGN DIRECT INVESTMENT AND TECHNOLOGY TRANSFER

The literature on FDI provides a broad definition of technology transfer. Some define technology as managerial practices and production methods (Blomstrom and Kokko 1997). The impact of FDI on technology transfer can be obtained by examining its influence on local competitors and backwardly linked host country suppliers. These two channels of technology transfer are known as 1) horizontal flows to local competitors and 2) vertical flows to backwardly linked suppliers (Kumar, 1996; Blomstrom and Kokko, 1997; Keller, 2001 and Moran 2001). According to Blalock and Gertler (2004), the positive influence of MNCs on local competitors can occur through a number of ways. For example, local firms may get some knowledge from these MNCs which they can apply into their own companies. Some of the workers working in these MNCs may also end up opening their own companies in the future (Blalock and Gertler, 2004).

The empirical research on the impact of FDI on technology transfer and spillovers found contrasting results. Blomstrom and Wolff (1994) in their research found FDI to have positive influence on local firm productivity. This was also supported by Haskel, Pereira and Slaughter (2002) who found positive influence of FDI on local firm in the United Kingdom. A survey conducted by Marin and Bell (2003) on 1533 firms in Argentina found that FDI has positive significant spillovers on domestic firms. However, the positive impact only arises in domestic firms that have strong linkages with MNCs. In other words the level of influence depends on the absorptive capabilities of local firms (Marin and Bell, 2003).

Research conducted by Blalock and Gertler (2004) found positive influence of vertical technological transfer on local suppliers. Local suppliers are benefiting from the training provided by MNCs in technological related areas. This was also found in studies conducted by Macduffie and Helper (1997) who found positive contribution by Japanese automobile makers on American parts suppliers. Similarly, Lall (1980) also found that the Indian trucking industry benefiting from foreign automakers in India through backward linkages.

On the other hand, there are criticisms that local firms do not benefit in terms of technology transfer. Aitken, Harrison and Lipsey (1996) found that many MNCs are hiring away talent from local firms and this creates a brain drain. They also claim that since MNCs pay much higher than local firms, this has negative influence on local labor costs. Another study by Aitken and Harrison conducted in Venezuela in 1999 found that FDI has negative influence on local firms which are smaller and are not able to compete.

CONCEPTUAL FRAMEWORK

Narayanan, Yew Wah and Kooi Guan (1997) who drew their conceptual framework on the process of technology transfer from the works of Komoda (1986) and Baranson and Roark (1985) identified three major stages of technology transfer: The adoption, rooting and diffusion stage. Stage one is known as the adoption stage whereby MNCs adopt their parent companies technology locally in their affiliates in the host country.

It can be argued whether this adoption stage is sufficient since it may not guarantee much transfer of technology from the parent company to the locals. This is because in this stage the locals are merely utilizing the foreign technology. Technology transfer must therefore go beyond this level especially in Malaysia since MNCs have been present here over more than two decades.

Stage two is known as the rooting stage where the local staffs are beginning to learn on the usage of technology on their own. At this level, the usage is not confine to operation alone but includes maintenance, repair and R& D as well. The staffs are noted to have mastered the skills once they are able to carry out research independently (Narayanan, Yew Wah and Kooi Guan, 1997).

Again this rooting stage was meant more for manufacturing firms where the process of operations maintenance, repair and R & D is clearly envisaged. To what extent this can be applicable to service MNCs is yet to be seen. The last and third stage of the technology transfer continuum is the diffusion stage whereby the technology begins to be transferred or diffused to other firms within the host economy through pecuniary and technological linkages.

Another view that is similar to the technological linkage was put forward by Kokko (1992) –known as the imitation effect or demonstration effect. This view was discussed by Blalock and Gertler (2004) who reiterated that local firms can learn by simply observing and imitating MNCs. This view can be argued since it is difficult to see whether learning takes place by merely observing and imitating. Even, if learning do take place, to what extent and how much? By merely observing alone may not allow the technology to be deeply rooted to reach the secondary stage as postulated earlier. More in-depth details and knowledge of the technology warrants greater involvement of the workers which can only be obtained by closely working and learning from the MNCs. Learning can also be enhanced through training of workers.

Another view on the channels of technology transferred is the diffusion of technology transfer through vertical and horizontal linkage (Kokko, 1992; Kumar, 1996; Blomstrom and Kokko, 1997; Keller, 2001; Moran, 2001 and Blalock & Gertler, 2004). According to the horizontal linkage view, technology will be diffused or transferred to local competitors since they will be pressured to improve on the technology they currently used.This can however be argued whether this can be considered "spillover" since there may be no element of learning or it is merely through imitation or observation. However, if the competitors have gained knowledge through a working relationship with the MNCs then it is possible to consider that as technology transfer. There are also instances where employees themselves end up becoming competitors to the MNCs.
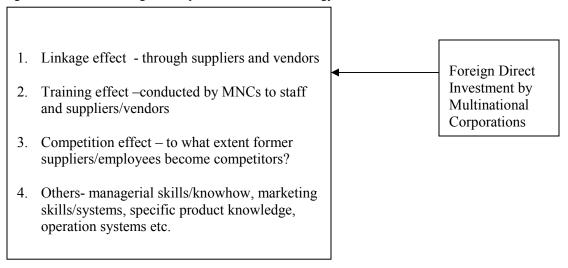
With regards to backward vertical linkage, technology spillover argument is more valid since suppliers are working together with the MNCs and may have obtained knowledge through experience and even training conducted by the MNCs.

It should be noted that MNCs can also have negative effect on competitors by forcing them out of the industry especially those that are not able to compete with the MNCs that are much stronger and larger in scale.

With that in mind, the conceptual framework that will be used for this research will concentrate and emphasise only on the "linkage effect" and "training effect" since these two are considered to be more effective in measuring the level of technology transfer. However, effort will be made to see to what extent knowledge gained by employees or suppliers through learning has led to "competition effect". Competition here will come from former employees or suppliers who are directly competiting with these MNCs by setting up their own companies. A simple schematic diagram is drawn to show the conceptual framework of this study (Figure 1). For manufacturing MNCs, technology transfer is deemed to exist if it reaches the last phase of the rooting stage and eventually the diffusion stage as postulated by Narayanan, Yew Wah and Kooi Guan (1997).

The situation gets more complicated with service MNCs since they are not involve so much with production. As such the definition of technology transfer in this study is broadened to include transfer/usage/diffusion of managerial skills/knowledge, marketing skills/systems, market knowledge, specific product knowledge, operation systems etc.

Figure 1 : Schematic Diagram: Impact of FDI on Technology Transfer

1. Linkage effect - through suppliers and vendors

2. Training effect –conducted by MNCs to staff and suppliers/vendors

3. Competition effect – to what extent former suppliers/employees become competitors?

4. Others- managerial skills/knowhow, marketing skills/systems, specific product knowledge, operation systems etc.

Foreign Direct Investment by Multinational Corporations

DATA AND METHODOLOGY

The data for this study was obtained mainly from primaryand secondary sources. To study the impact of FDI on technology transfer, interviews were conducted with senior managers of selected manufacturing and service MNCs. The selection of senior managers and the MNCs were based on convenience sampling. Six of the senior managers were from six different manufacturing MNCs scattered throughout Malaysia and another four were from different service MNCs scattered around Klang Valley, Malaysia.

The interviews conducted were highly in-depth. For those respondents located nearby, face to face interviews were conducted. For those located outside of the Klang Valley, telephone interviews were done. To ensure critical details were not overlooked, the respondents were provided with a set of questions a few days prior to the interviews. This is to allow the respondents to familiarize on the issues to be discussed and provide him/her a chance to be well prepared.

The in-depth interviews were also considered as highly structured in the sense that all the respondents were asked similar questions. However, they were allowed to elaborate and given opportunity to provide additional information/feedback if they wanted. This was done to ensure there existed consistency in the data collected and easier to analyze the opinions/facts provided during the analysis stage. Secondary data was also obtained from economic reports and newspapers where applicable.

DEMOGRAPHIC PROFILE OF THE RESPONDENTS AND THEIR RESPECTIVE MNCS

This section briefly outlines the demographic profile of the respondents and MNCs involved in the study. Table 2 and 3 depicts in detail the background information of the respondents and MNCs.

Table 2: Background of the respondents from the manufacturing multinational corporations

Respondents	Number of years experience	Current MNC	Nature of Business and R & D Location
First respondent (Senior Manager)	(12years) -has worked previously in two American and one Japanese firm in a similar environment	American This MNC was established in Malaysia in 2001	Manufacturing - labor intensive - a technology leader for fiber optics subsystems and network performance test systems -between 50 – 70 % of products are exported -R & D is done in the US -HQ
Second Respondent (Senior Engineer)	(12years) - has worked previously in an American and another Japanese firm in a similar environment	Japanese This MNC has been in Malaysia since 1973	Manufacturing -capital intensive - production of rare earth marnets, epoxy molding compounds, semiconductor silicone wafers, silicone rubber rollers, embossed carbon tapes -close to 50 % of products are exported and balance for the local market - R & D centers exist in each plant to tie them closely to each business and manufacturing division. However, core R & D activities are still based in Japan (HQ)
Third Respondent (Manager)	More than 8 years experience in this organisation	American	Manufacturing -Capital intensive -World's largest chip maker, also a leading manufacturer of computer, networking and communications products. - This MNCs design centre for handheld equipment is located in Malaysia.
Fourth Respondent (Senior Manager)	More than 15 years with this organisation	American	Manufacturing -global leader in wireless, broadband and automotive communications technologies and embedded electronic products. -capital intensive -This MNC has an R&D centre in Malaysia and designated it as a corporate design centre for cordless telephones worldwide
Fifth respondent (Senior Manager)	More than 10 years with this organisation	European	Manufacturing and Sales -capital intensive -Manufacturing of 1) Consumer products such as portable entertainment systems, home audio.video etc 2) Healthcare products 3) Semiconductors - More than 90% of the products are exported -The R & D centre is located at the HQ
Sixth respondent	10 Years	Japanese -This MNC has been in Malaysia since 1972	Manufacturing -capital intensive -Manufacturing of airconditioners - Established an R & D centre in 1991 -established technology centre in 1991 -established technical training school in 2000.

Table 3: Background of the respondents from the service multinational corporations

Respondents	Number of years experience	Current MNC	Nature of Business and R & D Location
First respondent	8 Years Established in Singapore in 1995	-Joint Venture between an American public listed company and the existing founder	Services -No R & D is done since their business is service based. However, R & D related to development of solutions and ICT technologies is outsourced or done by vendors
Second Respondent	10 years -went into hypermarket retailing in 1995	100% owned by a Hong Kong Based Company	Services - Retailing business from small scale supermarkets to hypermarkets - R & D is more related to market research and not development of products.
Third respondent	15 years	American	Services - total logistics provider
Fourth respondent	20 years	British	Services -The services provided are banking solutions and mainly related to CRM systems, work processes, use of integrated banking software and services etc.

MAIN RESULTS

This section will examine and evaluate the extent to which technology transfer by MNCs in both manufacturing firms and service industries are taking place in Malaysia.

FDI AND LINKAGE EFFECT – BY MANUFACTURING MULTINATIONAL FIRMS

Findings from the interviews conducted with the senior staff at the various manufacturing and service firms brought mixed results. All the respondents from the foreign manufacturing firms agreed that technology transfer exist at the adoption stage. The backward linkage effects exist when the manufacturing firms conduct business with their suppliers. For example, one Japanese manufacturer relies on these suppliers for spare parts, inspection equipment, raw materials, packing and packaging materials. However, for this Japanese firm, there is a tendency to rely on their own Japanese suppliers who are able to provide reliable and quality inputs according to their requirement. One reason cited for this is the difficulty for local firms to comply with their stringent terms and conditions. This practice was also found to exist in one of the American manufacturing firm.

If this is the case, then not much opportunity may exist for local suppliers to benefit in terms of technology. So, it will be difficult for technology to be deeply rooted if opportunities are not given to the locals. With regards to R & D location, four of the manufacturing firms R & D centres are located here. (Refer Table 2). For example, one of the Japanese manufacturer's has established an R & D centre, technology center and a technical training school in Malaysia to cater for their worldwide production. So, this will definitely benefit local employees sent for training at these schools and centers. Technology is therefore not only limited to the adoption stage but may also be deeply rooted into the R & D stage as well. However, rooting of technology will also depend on the absorptive capacity of the local staff employed. Having sophisticated technology alone in the R & D centre alone is not sufficient. Locals must be able to learn and absorb the technology and be able to conduct research independently.

One European manufacturing firm has done quite a bit to promote technology transfer. It is working closely with local vendors by supporting them through business ventures. For example, the 'Touch and Go' card used by commuters on the high ways in Malaysia uses a prototype technology –'contact less smart card' developed jointly by a European and local firm. The European firm also provides information and technical assistance in the development of other proto-type products. Even the 'MyKad' which uses the myfare technology, is developed jointly by a European MNC and a local partner. So, there is an element of technology transfer seen in such ventures.

This indicates that collaboration or joint ventures tend to a higher impact on technology transfer. However, this type of collaboration cannot be seen in all organizations.

Another example of technology transfer from this firm is seen in the development of ASTRO decoders that are now 100% manufactured locally. These decoders are developed by one of the largest foreign contract manufacturers – Sanmina-SCI Systems located in Penang, Malaysia. The decoders use an advanced chip technology manufactured by the European MNC located here. The transfer of technology involves not only manufacturing technology but also quality as well as test tools systems. The benefits to the locals can also be seen in terms of employment opportunities and other spillover effects arising from the use of logistics, metal, plastic and packaging materials provided by Malaysian industries.

However, it can be argued that the main technology beneficiary is Sanmina-SCI Systems which is not a local company. So, until the benefits of technology transfer are harnessed by local companies independently only then we can conclude that technology transfer is benefiting us. This is why Malaysian companies must take the initiatives to take the lead by securing major contracts rather than just becoming small time vendors. This practice was also emulated by the Japanese silicone manufacturer. 80% of the silica and 18% of the Resin used was purchased locally from foreign Japanese firms established here. It's difficult to see any backward linkage effect if local Malaysian firms are not involved at all in the supply chain. Contract manufacturing is one area where Malaysian local companies should go into so that they can collaborate with large foreign MNCs.

However, on the positive side, some of these Japanese suppliers do employ local engineers. So, this provides an opportunity to local engineers to gain some knowledge and insights into technology used. But, to what extent are these engineers going to absorb the technology used? Further examination found that unless our local engineers take the initiative to go on their own independently, only then we can say that technology transfer has reached the rooting and diffusion stage. Merely being employed in these foreign companies will only leave them at the adoption stage which is not enough for a country like Malaysia.

It was also found that the linkage effects with local companies in Japanese MNCs is limited and only confined to the supply of low value added products such as plastic and metal products in the manufacturing of air conditioners and audio equipment. The supply of high end value added products such as power circuit, audio circuit are still being controlled by the more established Japanese suppliers who may be locally and externally based. This indicates that it would be difficult for technology transfer to reach the diffusion stage if local suppliers are not given opportunities to go into production of high end value added components.

The executive from another American manufacturing MNC supported this statement. Products produced by Small and Medium Malaysian Industries (SMEs) for these MNCs are usually limited to low technology and that are nearing its end life. This is to avoid losing out valuable technological knowledge to outside parties. If this is the case, then what ever the SMEs gain is useless in the long run and will not benefit future advancement and development of knowledge. So, this indicates that the linkage effect does not generate growth of new and advance technology but limited to technology that is deemed to be nearing its end life or obsolete.

FDI AND LINKAGE EFFECT – BY SERVICE MULTINATIONAL FIRMS

It is difficult to examine the impact of technology in service MNCs since it involves intangible output. Services are known to have idiosyncratic characteristics where workers employed are more educated with higher level skills and as such are different from the manufacturing sector in attracting FDI (Erramilli and Rao 1993). Services are also different due to its intangibility, non-storability and non-transportability that make it unique in its own sense (Von Der Ruhr 2000). Most services industries such as business process outsourcing (BPO) service providers, banking and insurance, information technology and telecommunication firms are highly capital intensive and uses telecommunication and information technology to built their competitive advantage. However, some service areas such as retailing are still very much labor intensive.

From the service MNCs examined, one was a BPO service provider, one banking, one a hyper market retailer and the last one a foreign logistics provider. In the case of BPO service providers, the technology involved is basically related to Customer Relationship Management (CRM) technology such as computer telephony integration (CTI) technology. These firms have also developed special expertise in help desk, telesurveys, event management, customer support systems and knowledge management systems. From the investigation, it was found that there are minimal backward linkage effects. Most of these BPO providers rely extensively on other foreign MNCs to

supply software, networks and other solutions. For example, one of the BPO providers got their virtual private networks, multimedia service platform, and customer contact and voice portal solution from another foreign MNC that is locally based.

However, there exists employment opportunities since almost all employees are local. Then, there is also linkage with Malaysia infrastructure providers such as "Telekom" and "Tenaga National Berhad" (TNB). This is also because the telecommunication and energy sector is highly regulated by the government. Then, there are also some linkages with small time Malaysian hardware and transportation providers. The BPO service industry is still quite new and is very much ICT based. Therefore, until there are capable locals who are able to supply the technology required, it will be difficult to see greater linkage effects arising from Malaysian companies. As such, there are not much learning effects to arise from the FDI by BPO providers through linkages with local companies.

In the hyper market retailing industry, the linkage effects can be seen through backward linkage with transporters and other logistics suppliers, local banking firms and local infrastructure providers such as Telekom and TNB. In terms of the technology used, is mainly confined to retail management know-how such as inventory management control and ordering systems, the logistics warehousing systems and operation management systems. As such, not much can be gained through linkage effects since this business does not deal with sophisticated high level technology. However, greater technology effect will be experienced by the local staffs that are directly employed by these hypermarkets. This will be discussed further in the next section that examines FDI and training effects.

With regards to the logistics sector, the technology used is basically the operating systems, logistics solutions and systems, knowledge management systems, parcel tracking systems, customer relationship management and warehouse management systems. This technology or managements systems are mostly developed internally and externally. Most of the technology is emphasizing on the integration of ICT to improve delivery systems.

Where banking sector is concern, the technology is mainly confined to Customer Relationship Management (CRM) systems, work processes, use of integrated banking software and services and other banking solutions. These technologies rely extensively on the use of ICT. It was however noted that most of these banking solutions are not developed in-house but are obtained externally through outsourcing by specialists in the fields. It was found that in the banking industry outsourcing is again controlled by foreign firms based either based regionally or from the home country. Unless opportunities are given to local companies, it is difficult to see development and growth of our own local indigenous firms excelling in this area. One reason cited again is the lack of local firms capable of competing with these foreign outsourcing giants in the provision of banking technology.

These foreign firms are able to provide an array of technology solutions such as support services for core accounting, relationship management, teller and platform automation, internet banking, account aggregation, e-commerce solutions for business and consumers, business intelligence, imaging and document management. These firms act as leaders in providing leading information management systems and business process outsourcing, as well as software and systems solutions. Malaysian firms can benefit hugely by working with foreign banks. They will not only gain access to its specialized internal resources but also skilled personnel, databases and other reference materials.

FDI AND TRAINING EFFECT – MANUFACTURING MNCS

Another channel whereby technology can be transferred from MNCs to local firms is via training. This is known as 'training effects' in the literature on technology transfer. It was found that all the MNCs examined have their own internal and external training programs. These programs are meant for both employees as well as suppliers. For example, one Japanese air conditioner manufacturer has established an advanced technical training school in air conditioning technology both for the parent company and the public. This MNC is highly capital intensive and has also established its own technology centre to improve the companies precision die and mould design. Employees not only attend training but are also selected as project heads. This indicates that learning effects exist in such organisation. This shows that technology transfer has gone beyond the adoption stage ands to some extend the rooting stage. This is evident with the involvement of Malaysian engineers to spearhead repair, maintenance and R & D work in the design of the technology independently.

But this is where it ends. Malaysian engineers remain as employees and there is not much diffusion or filtering down of technology seen. Even, if these engineers leave the MNCs, they end up working with other foreign MNCs. As

such their role may still be the same. Unless these engineers end up joining Malaysian owned manufacturing firms producing their own local products, only then some amount of technology filtration may exist.

Another European MNC has also contributed to cultivate the innovative ability of locals. For technology transfer to be effective there is a need to boost the absorptive capability of locals. Thus, this European MNC came up with a young investors challenge program to cultivate and create new technology. The program offers opportunities to students to show their creativity and foresight and imagination to create new products.

Even local suppliers are required to undergo training programs. This is to ensure these local suppliers are familiar and are able to adhere to the stringent quality control requirements set by these MNCs. Most of these MNCs products are catered for the export market and therefore it must confirm to certain level of quality determined by the buyers or importers.

It was however found that one American MNC had doubled the number of design and development engineers to 500 in its Asia Design Centre in Penang. The expansion was done to support the transfer of technology to Malaysia to produce competitive trunked radio and Associations of Public Safety Comunications Officials digital communications products. This design centre hired local talents to facilitate the expansion. This indicates that there are positive training effects from these MNCs. However, the training effects are confined to learning effects and it is yet to be seen if those trained will be able to move out on their own. This again indicates that technology transfer has gone beyond the adoption stage and moved into the rooting stage. However, it was noted again that the training effect on R & D is confined to very simple non- value added activities.

In the service sector, the training effects are also positive since most service MNCs conduct in house and external training programs for their local staff. Training is provided in a variety of areas. In the Business process outsourcing business, on the job as well as in house training program is adopted. These training programs expose local workforce to international best practices and standards. It also improves the technical capacity of local solution providers that provide software and integrated business packages especially in the banking, BPO and logistics industries.

FDI AND COMPETITION EFFECT

Most MNCs in the manufacturing sector are established firms having global presence all over the world. Therefore, this gives them huge advantage to achieve economies of scale which consequently puts them well ahead of their competitors. On top of that, they possess the required resources to invest in R & D and as such are the market leaders in their respective fields. It is difficult to see much head on 'competition effect' taking place in Malaysia. It is difficult and not easy for Malaysian companies to compete with such MNCs head on unless certain privileges are given to them. In the automotive industry, our own national car assembler, 'Proton' was given a huge handicap in terms of regulating the local automotive market from established foreign players. Even with that, it is not sure if Proton can compete successfully in the open market once The Asian Free Trade Agreement (AFTA) on automotive trade begins to take place in 2005.

However, there are isolated cases where some Malaysian companies have done extremely well. For example, IC Microsystems, a local microchip design company has done well by producing 27 chip designed under its stable. The founder of this company has worked with an established semiconductor companies such as Motorola before venturing on his own. This is a classic example of competition effect taking root. Then, there are local circuit board assemblers such as Malaysian Pacific Industries and Unisem. They have established themselves quite well in the circuit board assembling industry and are currently providing its products to MNCs locally and abroad (The Star, January 19, 2004). This indicates that competition effect has taken place.

In the service industry, there should be more avenues for Malaysian companies to flourish. The service industries rely extensively on ICT technologies which are usually outsourced from established ICT suppliers locally or abroad. It is easier to imitate the services provided by service MNCs since services are relatively d difficult to protect. This should give local companiesoportunities to strike out on their own by offering similar services. In the BPO industry, local players such as SCICOM has established themselves as the leaders in the industry. This indicates again that competition effect is beginning to take place.

IMPACT OF FDI ON THE DEVELOPMENT OF OTHER SKILLS

Apart from the development of sophisticated skills, MNCs are also involved in the development and nurturing of other intangible soft skills such as use of new management methods, people skills etc. In the services sector, such skills are very essential since this sector deals with customers directly. Therefore, employment of local staff by service MNCs will definitely enhance competence and upgrade the skill level of local staff. For example, in the BPO industries, one of the factors that attracted large number of foreign BPOs into Malaysia is their exposure and experience in people skills. The latest AT Kearney's Offshore Location Attractiveness Index placed Malaysia at number three behind India and China (AT Kearney, 2004).

Similarly, in the manufacturing sector it was found that Malaysian workforce especially at the executive and management level, are exposed to various management styles practices by the American, Japanese ands European MNCs. Working with MNCs will also expose staff with international marketing skills which may be different. It may also enhance our marketing contacts worldwide.

CONCLUSION

FDI has contributed enormously to the Malaysian economy in view of its impact on employment, export led growth etc. However, the impact of FDI on generating technology transfer is still not substantial. Most technology transfer is still in the adoption and early phase of the rooting stage. It has been more than twenty years since Malaysia opened its doors to MNCs via FDI. As such, there is a need for Malaysia to go beyond these early stages of technology transfer. What we need is a leap toward the final phase of the rooting stage and begin making in roads into the last stage that is the diffusion stage.

The government should play a more proactive role rather than just provide incentives openly. There is a need to re-examine the current FDI incentives provided and ensure that these incentives are promoting the transfer of technology beyond the adoption and rooting stage. More selected incentives should be given to encourage the development of pecuniary and technological linkages.

The Federation of Malaysian Manufacturers (FMM) should play a more proactive role to ensure that more opportunities are provided to Malaysian companies especially the SMEs who can collaborate and gain from these MNCs. These SMEs should be given opportunities to go beyond producing only low value added products to high end value added products. Only then, we will be able to see greater technological linkages and pecuniary effects arising from such collaborations. Production of high end value added products by Malaysian firms will have greater economic impact on the Malaysian economy in the long run.

There is a need also to develop further the spirit of entrepreneurship among Malaysian firms which was found to be very much lacking. This was the reason for the small or very little number of SMEs venturing into production of high end value added products. Once SMEs go into production of high end value added products, this will eventually be the stepping stone towards establishing large scale manufacturing firms producing our own home grown brands. 'PENSONIC' and 'IRIS' Are two typical local home grown companies that have made the grade. IRIS technologies is a wholly owned local company that specializes in the research, design and development of smart card technology solutions and the manufacturing of smart card related products. Pensonic is the first local producer electronic home appliances engaging in the manufacturing, assembly, wholesale and trading of electronic and electronic products.

It is difficult for the government to force MNCs to support our local industries through linkages. There is a need to ensure that our SMEs are capable and can meet up to the expectations of these MNCs interms of providing inputs at low cost high quality inputs and efficient delivery commitments. If they are not able to do this, then MNCs will be reluctant to support these SMEs. The government must ensure avenues exist for SMEs in terms of financial support to upgrade themselves. Where policies to attract MNCs are concern, it must be geared to achieve a win-win situation. If this does not happen, Malaysia will end up reaching a "stagnant" level and our economic growth will continuously depend on importation of foreign technology and skills. Ultimately, there must be certain avenues created for the development and growth of our own indigenous technology.

REFERENCES

Aitken, BJ., and Harrison, AE, (1999): "Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela," *American Economic Review*, 89(3), 605–618.

Aitken, BJ, Harrison, A and Lipsey, RE, (1996) . "Wages and Foreign Ownership: A Comparative Study of Mexico, Venezuela, and the United States", *Journal of International Economics*, Vol. 40, No. 3/4, pp. 345-371.

Baranson, J and Roark, R, (1985), ' Trends in North-South Transfer of High Technology', in Rosenberg, N and Claudio, F (eds), International Technology transfer, Praeger, New York.

Blalock, G and Gertler, PJ, (2004), 'Welfare gains from foreign direct investment through technology transfer to local suppliers', < http://aem.cornell.edu/faculty_sites/gb78/wp/blalock_dfdi_013104.pdf>

Blomstrom, M and Kokko, A (1997), 'How foreign investment affects host countries?' *Policy Research Working Paper*, no.1745, World Bank.

Blomtrom, M. and Kokko, A. (2002), 'FDI and human capital: a research agenda', *OECD Technical papers* No. 195, OECD Development Centre.

Blomstrom, M and Wolff, E (1994), 'Multinational Corporations and Productivity Convergence in Mexico', in W. Baumol, Nelson, R and Wolff, E (eds), *Convergence of Productivity: Cross National Studies and Historical Evidence*. Oxford: Oxford University Press.

Clemes, MD, Arifa, A & Gani, A, (2003), 'An empirical investigation of the spillover effects of services and manufacturing sectors in ASEAN countries', *Asia-Pacific Development Journal*, vol.10, No.2, pp.29-40.

Cutter, C (u.d), ' Foreign Direct Investment in Developing Economies: A Study of Mozambique and Uganda',
<www.berea.edu/faculty/berheidem/ KPSA/Rifai/Cutter.Rifai99.html - 42k>

Griffin, RW & Pustay, MW, (1998), *International Business: A Managerial perspective* (2Ed), Addison Wesley, US.

Haskel, Pereira, S and Slaughter, . (2002), 'Does inward foreign direct investment boost the productivity of domestic firms', Cambridge, MA, *National Bureau of Economic Research Working Paper* No. 8724.

Hymer, SH, (1976), The International Operations of National Firms: A Study of Direct Foreign investment, Cambridge, MA: MIT press.

Keller, W., (2001), 'International technology diffusion', NBER Working Paper Series, No. 8573.

Kumar, N (1996), 'Foreign Direct Investments and Technology Transfers in Development: A Perspective on Recent Literature', *Discussion paper series*, The United Nations University, Institute for New Technologies.

Kokko, A (1992), 'Foreign Direct Investment, Host Country Characteristics and Spillovers. The Economic Research Institute, Stockholm.

Komoda, F (1986), ' Japanese Studies on Technology Transfer to Developing Countries: A Survey', Developing Economies, Vol:24, No:4.

Lall, S, (1980), 'Vertical Inter-Firm Linkages in LDCS: An Empirical Study', *Oxford Bulletin of Economics and Statistics*, 42, 203–226.

Macduffie, JP, and Helper, S (1997), 'Creating Lean Suppliers: Diffusing Lean Production through the Supply Chain', *California Management Review*, 39(4), 118–151.

Markusen, J. (1998), 'Multilateral rules on foreign direct investment: the developing countries stake', Working paper prepared for the World Bank.

Marin, A and Bell, M (2003), 'Technological spill overs from foreign direct investment (FDI)L an exploration of the active role of MNC subsidiaries in the case of Argentina in the 1990s', *Conference proceedings of the Danish Research Unit for Industrial Dynamics (DRUIDS)*
< http://www.druid.dk/conferences/summer2003/Abstracts/MARIN_BELL.pdf>

Ministry of Trade and Industry (MITI) 2003, 'Malaysia's trade in services'<http://www.miti.gov.my/speech-10dec03.html>

Moran, TH, (2001), 'Parental Supervision: The New Paradigm for Foreign Direct Investment and Development', Institute for International Economics, Washington,DC.

Narayanan, S, Yew Wah, L and Kooi Guan, C (1997), Technology Transfer: Measuring How Far We Have Come', in Ghosh, BN, Yew Wah, l and Narayanan, S (eds), *Industrialisation in Malaysia: Some Contemporary Issues*. Utusan Publication and Distributors.Malaysia.

United Nations Conference on Trade and Development 2003, *World InvestmentRreport*,United Nations, New York, Geneva.

Fan, EM (2002), 'Technological Spillovers from Foreign Direct Investment – A Survey', *Economics and Research Department Working Paper Series:* 33, December.

Malaysian Bilateral Trade Relations and Economic Growth

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ABSTRACT

This paper examines the structure and trends of Malaysian bilateral exports and imports and then investigates whether these bilateral exports and imports have caused Malaysian economic growth. Although the structure of Malaysia's trade has changed quite significantly over the last three decades, the direction of Malaysia's trade remains generally the same. Broadly, ASEAN, the EU, East Asia, the US and Japan continue to be the Malaysia's major trading partners. The Granger causality tests have shown that it is the bilateral imports that have caused economic growth in Malaysia rather than the bilateral exports.

INTRODUCTION

Malaysia, as an open economy, has been very much dependent on foreign trade to achieve its economic development goals. Foreign trade (exports plus imports) has accounted for a significant and rising portion of its gross domestic product (GDP) in the last three decades, indicating that international trade has been playing an important role in the development of Malaysian economy. The share of merchandise trade in GDP was 73% in 1970, increased to 172% in 1995, and increased further to 202% in 2000. If we take the share of the merchandise trade in GDP as an indicator of trade liberalization, Malaysia certainly has gone through a relatively rapid process of trade liberalization and globalization. Thus, it has become the major objective of this paper to analyze the trends in bilateral trade relations of Malaysia with her traditional major trading partners: Singapore, Japan, the United States, and the EU and her new major trading partners: ASEAN and the East Asian nations and see whether these trade relations have had contributed to the relatively rapid growth of the Malaysian economy. In particular, the decision made by Malaysia to implement the export-oriented development strategy beginning in 1980s has been the major vehicle that has transformed Malaysia from the primary commodity based economy to a more industrial based economy. As a result, Malaysia recorded an average of 8 percent economic growth for about nine years prior to the 1997 East Asian financial crisis. This financial shock had a profound impact on Malaysian economy when it registered a negative one per cent growth rate in 1998. The economy began to recover the following year.

The paper begins with an introductory remarks on bilateral trade relations, followed by a detail discussion on the directions of bilateral exports and imports between Malaysia and her major trading partners: the USA, Japan, and Singapore. The third section deals with the issue of whether exports and imports cause economic growth in the context of Malaysia, followed by sections on the methodology, empirical results and finally the conclusion.

DIRECTION OF EXPORTS AN IMPORTS

Malaysian total trade, imports plus exports, has been increasing steadily beginning at RM 9.451 billion in 1970 and increased to RM 684.729 billion by 2000. Japan, the United States, the Association of South-East Asian Nations, the European Union have been the major Malaysian trading partners which together accounted for more than 70% of Malaysia's total trade flows during the 1970–2000 period. In recent years East Asia, comprising South Korea, Hong Kong, Taiwan and China, have become increasingly important Malaysian trading partners while that of the EU has declined. Interestingly, the direction of Malaysia's trade follows closely with the sources of foreign direct investments in Malaysia, especially in the manufacturing sector, as foreign firms investing in Malaysia's manufacturing sector generally source their intermediate goods from their parent or associated companies in their home countries. Subsequently, the processed products are exported back either to their country of origin or other markets. Hence, Japan, the US, ASEAN, East Asian and the EU have been the major source of foreign direct investment in Malaysia. In 2000, the USA was the largest investor in Malaysia at 37.7 percent, followed by Japan at 14.5 percent, Singapore at 8.9 percent, Taiwan at 4.6 percent, South Korea at 3.6 percent, and Hong Kong at 1.7 percent.

Exports

There has been a tremendous increase in the Malaysia's exports during the 1970 – 2000 period. Malaysian total exports in 1970 was at RM5263 million which increased further to RM28172 million in 1980 growing at an annual rate of 43.5 percent. In 1990 the total exports was RM79646 million registering an increase of 18.3 percent per year during the 1980-1990 period. There was a resurgence of Malaysia exports in 2000 at RM373,270 million giving a growth rate of 36.7 percent in 1990-2000 period. Most of the exports went to ASEAN and the US, followed by EU and Japan. They accounted for 76% of Malaysian exports in 1970 which declined to 70% in 2000.

Individually, in 1970 ASEAN imported 25% of Malaysian exports, the EU market at 20%, Japan at18%, the US at 13%, and the East Asian market at only 6%. In 1990, ASEAN still remained the biggest market for Malaysia's exports which accounted for 29% of total exports. However, most of our exports to ASEAN are destined to Singapore. The US was in second position at 17%, followed by the EU at 15%, Japan at 16 percent and East Asia at 12%. The importance, in terms of export shares, of the US, ASEAN and East Asia as Malaysian export markets had improved over the 1971-93 period while that of the EU declined from 20% in 1970 to 14% in 2000 and similarly the exports to Japan declined from 18% in 1970 to 14% in 2000. By 1990s, East Asia became one of the major Malaysian exports markets where its share of Malaysian exports increased from a merely 6 percent in 1970 to more than 15 percent in 2000.

By country, Singapore, Japan and the US are Malaysian major export markets. They together, accounted for 53% of Malaysia's exports in 1970. In 2000, they continued to account for more than 52% of Malaysian exports. Singapore was Malaysian largest export market in 1970 and remained so in 1993, accounting for about 22% of the exports. Japan was our second largest export market in 1970; however, the position was overtaken by the US in the 1990s. In 2000 the USA import was the major importer at 21%, Singapore at 18%, Japan at 13%. The share of Malaysian exports to the rest of the world has declined from 17% in 1970 to just 4 percent in 2000.

The structure of Malaysian exports has changed substantially. In 1970s and 1980s, most of the exports were in the form of raw materials: inedible crude materials, mineral fuels, and lubricants which had decreased from 61 percent in 1970 to 57 percent in 1980. By 1990 these exports accounted for only 33 percent of the total exports while the exports of manufactured goods had begun to emerge when its share increased from 26 percent in 1970 to 55 percent in 1990. The contribution of the inedible crude materials, mineral fuels, and lubricants fell to merely 12 percent in 2000 while that of manufactured products increased to 82 percent. Although the manufactured exports have increased substantially, it has some major weaknesses in terms of its composition. Specifically, most of the manufactured exports have been in the form of intermediate manufactured goods where their shares increased from 23 percent 1970 to 49 percent in 2000. The exports of machinery and transport equipment increased from 2 percent in 1970 to 25 percent in 2000. Malaysian exports of final manufactured goods is still relatively small contributing only 8 percent of the total exports in 2000. The changes in the structure of Malaysian exports have been due to the deliberate government policy to industrialize and develop the domestic economy through the export-oriented development strategy since 1980s by diversifying and intensifying the export base and at the same time focusing on manufactured exports.

The structure of Malaysian trade with Japan has changed over the last 30 years. In particular, during 1970 – 1990 period, Malaysian exports to Japan were mainly in the form of raw materials, inedible crude materials, mineral fuels and lubricants which accounted for 68% of the total exports to Japan in 1990. But by 1990s, there has been a significant shift towards the export of machinery, such as electrical, non-electrical and electronics, and transport equipment and as well as final manufactured goods. Thus in 2000 Malaysian exports of raw materials to Japan was only at 38 percent compared to 59 percent of machinery and transport equipment and final manufactured goods in the same period.

Similarly, Malaysian exports to the US were comprised mainly of raw materials and intermediate manufactured goods in 1970s, which accounted for 93% of the total exports in 1970 but declined to 59 percent in 1980. As foreign direct investment from the US in the electrical and electronics sector increased, the structure of Malaysian exports to the US has also changed accordingly. Specifically, Malaysian exports of machinery and transport equipment increased dramatically from a negligible amount in 1970 to 31 percent in 1980 and by 2000 it had increased to 78 percent. The exports of final manufactured goods also increased from just 2 percent in 1970 to 13 percent in 2000.

Although Malaysian exports to Singapore follows the same patterns as Japan and the USA, generally they are quite diversified resembling the Malaysian export structure. This is not surprising as Malaysia has been using Singapore to export her products since Singapore has been the major entreport port in the region. Therefore Malaysian exports to Singapore are mainly for re-export. Thus in 1970's, Malaysian exports to Singapore were

mainly food, beverages, tobacco and inedible raw materials accounting for 87 percent of exports in 1970 and 81 percent in 1980. By 1990s most of Malaysian exports are in the form of machinery and transport equipment where they accounted for 44 percent of Malaysian exports to Singapore in 1990 which increased further to 73 percent in 2000.

Imports

The major sources of Malaysian imports have been the EU, ASEAN, the US, Japan and East Asia each accounting for 23 percent, 23 percent, 9 percent, 17 percent, and 10 percent respectively in1970. Since then the Malaysian imports from EU have started to decline to 16 percent in 1980 and decreased further to 11 percent in 2000 mainly due to the fall of thr imports from the UK. The share of imports from ASEAN remained steady at about 23 percent during the same period. Malaysia began to source more imports from the US and Japan in 1970s. The share of imports from the US increased from 9% in 1970 to 17% in 1990 and remained at the same level in 2000. Malaysian imports from Japan was 17% of its total imports in 1970 but increased to 24 percent in 1990 and remained steady at about 21 percent 1990s. For East Asia: Taiwan, South Korea, China, and Hong Kong have become about equally important sources of Malaysian imports. As of 2000, Japan was the most important sources of Malaysian imports, followed by the USA, and Singapore.

In early 1980s Malaysia had begun her export-oriented development strategy focusing on the exports of manufactures. As she does not have abundant in raw materials and capital goods, Malaysia has to import more of the intermediate manufactured goods and the machinery and equipment from abroad. In 1970, Malaysia imported almost an equal proportion of food, beverages, tobacco, and fats at 21 percent; inedible crude materials, mineral fuels, and lubricants at 20 percent; intermediate manufactured goods at 25 percent; and machinery and transport equipment at 28 percent.

Japan has been one of the major sources of Malaysian imports. The structure of the imports from Japan has remained more or less the same where the intermediate manufactured goods and machinery and transport equipment accounted for more than 90% of the total imports over the 1970 – 2000 period. Nevertheless, there has been a significant shift from the import of intermediate manufactured goods towards the import of machinery and transport equipment. As a result, the share of intermediate manufactured goods imported fell from 49% in 1970 to 23% in 1993, while that of machinery and transport equipment rose from 42% to 68% in the same period. Most of the imports were intermediate manufactured goods and machinery and transport equipment which accounted for 91 percent of the imports in 1970. Beginning in 1980s, the imports of intermediate manufactured goods have begun to decline while that of machinery and equipment have started to increase. And by 2000, the imports of intermediate manufactured goods fell to 21 percent while that of machinery and equipment rose to 70 percent.

The structure of imports from Singapore has been quite diversified. The food, beverages, tobacco, inedible crude material and intermediate manufactured goods accounted for 78% of the imports in 1970. Beginning in 1990, there was a shift to import more of machinery and transport equipment accounted for 40 percent of the total imports from Singapore. Malaysian imports from Singapore are mainly raw materials and machinery and transport equipment. The imports of raw materials have been in the downward trends while that of machinery and equipment are in the upward trends. In 1970 Malaysia imported 32 percent of inedible crude materials, mineral fuels and lubricants, 26 percent intermediate goods and only 4 percent of machinery and transport equipment; by 2000 these have changed to 18 percent, 12 percent, and 61 percent respectively. In 1970 Malaysia also imported substantial amount of food, beverages, tobacco, oils and fats at 20 percent and final manufactured goods at 8 percent; by 2000 the import of these goods fell markedly and settled down at 1 percent and 5 percent respectively.

The United States has also been an important source of Malaysian imports, notably in intermediate manufactured goods and machinery and transport equipment. The imports of intermediate manufactured goods had declined from 16 percent in 1970 to 9 percent in 2000 while that of transport and equipment increased from 59 percent to 76 percent in the same period. The imports from the USA were more diversified. In 1970, the import of food, beverages and tobacco, intermediate manufactured goods and machinery and transport equipment accounted for close to 90 percent of the total imports to Malaysia, with the latter forming the largest portion of imports at 59 percent. During the last 30 years, machinery and transport equipment remained the largest import category from the US and its proportion had increased from 59 percent in 1970 to 76 percent in 2000, reflecting mainly the increase in the imports of thermionic valves for the electronic industry.

EXPORTS, IMPORTS AND ECONOMIC GROWTH

This section discusses the hypothesis of export-led growth which suggests that export growth is an important determinant of the production and employment growth of an economy. It is argued that the export growth, through its foreign trade multiplier effect, results in an expansion of production and employment. Furthermore, the foreign exchange earnings generated by the export expansion can be then utilized to import more capital goods to help increase the domestic production capacity. The production and export expansion will allow the exportable sector to experience economies of scale and the use of more efficient technology. All these suggest that there exist causal relationships between imports, exports and economic growth. In order to test for the existence of a long-run or trend relationship among economic growth and export growth and import growth, the cointegration approach developed by Engle and Granger(1987), Johansen(1988) and Stock and Watson (1988) is employed in this study. To ward this end, we analyze quarterly data of Malaysia, using the multivariate cointegration technique proposed by Johansen to test for a long-run relationship between economic, export and import growth.

Empirical studies on the export growth – economic growth relationship uses either country cross-section data or time series data for a single country such as Jung and Marshall(1985) and Marin(1992). Country cross-sections studies tend to suggest that there is a strong relationship between economic and export growth rates. There are three possible relationships between exports and economic growth could be examined, namely the export-led growth, growth-driven exports, and the two-way causal relationships, termed as feedback. Studies on export-led growth by Michaely(1977), Feder(1982), Marin(1992), Thornton(1996) suggest that countries exporting a large proportion of their output tend to grow faster than others. The export expansion results in production expansion and therefore has the ability to create spin-off effects with the other sectors of the economy through the technological spillovers and other externalities. Models by Grossman and Helpman(1991), Rivera-Batiz and Romer(1991), Romer(1990) suggest that the expansion of international trade increases the number of specialized inputs which then causes economic growth as the domestic economies become more open to international trade.

A number of economists question the export-led growth hypothesis. Specifically, Bhagwati (1988) argues that an increase in economic growth may also lead to trade expansion. Furthermore an increase in exports could be due to the reduced in protectionism. Thus, there is a possibility of a two-way causal relationship between growth and trade. Bhagwati(1988) argues that an increase in trade produces more income which then facilitates more trade. This possibility has also been pointed out by Grossman and Helpman (1991) in their models of north-south trade. Before the financial crisis of 1997, the Malaysian economy grew quite rapidly and some argue that that was because of the success of the Malaysian export-oriented development strategy. But studies on the export-led growth(ELG) suggest mixed results on Malaysia. Dodaro(1993) finds that export growth has contributed negatively to the Malaysian economic development. Bahmani and Alse (1993) concluded there is no long-run relationship between export growth and economic growth in Malaysia. But to the contrary, Doraisamy(1996) finds a bidirectional causality between export growth and economic development. A recent study by Yousif(1999) supports the ELG hypothesis.

METHODOLOGY

The issue as to whether export growth cause economic growth or economic growth causes export growth or whether a bidirectional relationship exists between export growth and economic growth should be verified empirically. This study begins by analysing the integration properties of the data. In order to investigate the stationarity properties of the data, a univariate analysis of each of the time series: real GDP represented by the industrial production index, real exports, and real imports is carried out by testing for the presence of a unit root using the familiar Augmented Dickey-Fuller (ADF) test, Dickey and Fuller(1979) and Phillips-Peron test, Phillips and Perron (1988).

If all or most of the variables have unit roots, then the likelihood ratio test is used to find out the number of cointegrating vectors. Therefore, if there is one or more than one co-integrating vectors, then there exist the long-run combination among the variables, even though they may drift apart in the short run. We shall employ the Johansen (1988, 1991) and Johansen and Juselius (1990) approach to test the cointegration among the variables in the model. If the variables are cointegrated, the the error-correction model(ECM) will be estimated to investigate the long-run and short-run dynamic relationships of the variables in the model. The error-correction terms(ECTs) are derived from the cointegrating vectors found through Johansen's multivariate cointegration test procedure. The ECM is then used as another channel to test Granger causality.

Following Engle and Granger (1987), the error-correction model (ECM) for the *i*-th country can be written as:

$$\Delta YM_t = \alpha_{0i} + \lambda_i\, ECM_{it-1} + \sum_{j=1}^{k} \alpha_i \Delta X_{it-j} + \sum_{j=1}^{k} \beta_i \Delta YF_{it-j} + \sum_{j=1}^{k} \delta_i \Delta M_{it-j} + \varepsilon_{it}$$

where Δ is the first-difference operator, YM is the domestic(Malaysia) income, X_i is the Malaysian exports to trading partner i, M_i is the Malaysian imports from i-th trading partner, YF_i is the income of the i-th trading partner, k represents the number of lags of the explanatory variables, ECM_i is the error-correction term generated from the Johansen multivariable process and ε_i is the disturbance term, i=USA, Japan, and Singapore. All the variables are in log transformed. The t-test is used to ascertain the significance of the variables in the short-run while the coefficient of the error correction term captures the short-run effects of the long-run dynamics. Since the variables are cointegrated, in the short run the deviations from this long-run equilibrium will feed back in the changes of the dependent variable forcing the movement of the variables towards the long-run equilibrium. Thus, the coefficient of the lagged error-correction term is a short-run adjustment coefficient representing the proportion by which the long-run disequilibrium in the dependent variable is being corrected in each period.

Sources of Data

In this study, the quarterly data were collected from Quarterly Bulletin of Bank Negara Malaysia and International Financial Statistics, IMF over the period 1974:1 to 2001:4. The data are the industrial production indices of Malaysia, the USA, Singapore, Malaysia; Malaysia's real exports to and real imports from the USA, Japan, and Singapore.

EMPIRICAL RESULTS AND DISCUSSION

In this section we shall discuss the results of the unit root test, cointegration test, and Granger-causality test. The lags for the unit root test are set to 4 quarters as suggested by the Akaike Information Criteria, AIC. The lag length for the ADF tests was selected to ensure that the residuals are white noise. The estimated ADF and PP statistics against the corresponding critical values reveal that the null hypothesis of unit root of the variables on level cannot be rejected at the 5% level of significance. This implies that the variables are non-stationary on levels. But the ADF and PP tests using the first difference of the variables indicate that these test-statistics are individually significant at the 1% level suggesting that the variables are stationary on first difference, that is each of the   series is integrated of order one.

The results of the Johansen cointegration test and the normalized estimates of the eigenvectors are reported in Table 1. The lag length of the level VAR system was determined by minimizing the Akaike Information Criterion, AIC. The null hypotheses of non-cointegration are rejected, suggesting that at least one cointegrating vector exists in each of the countries. The USA cointegration equation suggests that only the US income influences Malaysian income in the long run where it is significant at I percent level, while the exports and imports are not, although they all show the correct signs. In the case of Japan only the Japanese imports from Malaysia determines the Malaysian income where it is significant at 1 percent level, while Japanese income and exports to Malaysia are not significant. The cointegration equation of Singapore indicates that both Malaysian exports to Singapore and Singapore's income are significant at 5 percent level, while Singapore exports to Malaysia is insignificant.

Granger-Causality

The Granger Causality tests for Singapore, the United States, and Japan are given in Tables 2, 3, and 4. Generally, the results are not that encouraging. Specifically, in every case it is found that Malaysian exports to her traditional trading partners do not cause economic growth in Malaysia. But in all cases, it is found that it is the imports from the major trading partners that seem to cause economic growth in Malaysia. Furthermore, there is little statistical evidence to suggest that the US, Japan, of Singapore economic activities affect the performance of Malaysian economy.

Table 1: Johansen's Test for the Number of Cointegrating Vectors (VAR with 4 lags)

	Test Statistics				
	Maximal Eigenvalue		Trace		
Null	Statistic	5% critical value	Statistic	5% critical value	
					UNITED STATES
$r = 0$	30.5982 *	23.80	65. 0910**	45.58	
$r \leq 1$	7.9536	17.89	15.2108	29.75	
$r \leq 2$	5.7563	11.44	7.2571	16.31	
$r \leq 3$	1.5008	3.84	1.5008	6.51	

Co-Integration Equation

$$YM = 0.321572XUS + 0.146997MUS + 0.856902\ YUS$$
$$\qquad (0.22139) \qquad (0.22052) \qquad (0.10547)$$

JAPAN

	Maximal Eigenvalue		Trace	
$r = 0$	31.1090*	28.14	65.9185 **	53.12
$r \leq 1$	17.6218	22.00	34.8095	34.91
$r \leq 2$	10.7743	15.67	17.1876	19.96
$r \leq 3$	6.4133	9.24	6.41330	9.24

Co-Integration Equation

$$YM = 0.879577\ XJ + 0.241124MJ + 0.504593\ YJ - 2.381669\ C$$
$$\qquad (0.17518) \qquad (0.15139) \quad (0.332280) \quad (1.10928)$$

SINGAPORE

	Maximal Eigenvalue		Trace	
$r = 0$	25.8100*	28.14	65.0745**	53.12
$r \leq 1$	19.0109	22.00	39.2644	34.91
$r \leq 2$	14.0055	15.67	20.2535	19.96
$r \leq 3$	6.24799	9.24	6.24799	9.24

Co-Integration Equation

$$YM = 2.790039\ XS + 0.155237\ MS + 5.392662YS - 0.215352\ C$$
$$\qquad (1.10217) \qquad (0.73769) \quad (1.94386) \qquad (2.30507)$$

Notes: * significant at 5 % level; ** significant at 1 % level, figures in parentheses are the standard errors.

In the case of Singapore, the results are somewhat interesting. In particular, the Malaysian imports from Singapore causes an increase in Malaysian income and the increase in imports from Singapore also causes an increase in Malaysian exports to Singapore. There is no statistical evidence to suggest that Malaysian exports to Singapore causes the Malaysian income to rise, but Malaysian exports have caused the imports from Singapore to increase. Thus, there exists a bidirectional relationship between Malaysian exports to and import from Singapore. The impact of an increase in Malaysian exports to Singapore on Malaysian income is rather indirect; that is an increase in exports to Singapore causes the imports from Singapore to rise, and this increases Malaysian income. Furthermore, an increase in Singapore economic activities causes Malaysian imports from Singapore to rise and consequently causes Malaysian economic activities to rise.

In the case of the United States, the results are less interesting. Both Malaysian imports from the US and the US income Granger-cause Malaysian income, but the impacts are rather weak since they are significant only at 6 percent level.

The results also suggest that the Japanese income or economic activities have significant impact on the performance of Malaysian economy. Specifically, Japanese exports to Malaysia causes Malaysian income to increase, while Japanese income cause both Malaysian exports to Japan and imports from Japan to increase. But again there is no direct link between Malaysian income and Malaysian exports to Japan.

Table 2: Granger Causality Tests - Singapore

	YM[a]	XS[a]	MS[a]	YS[a]	ECM[a]
			Wald Statistics		
YM	-	4.6046 (0.3303)	10.4246 (0.0339)	2.9543 (0.5655)	-0.0479 (-0.8471)
XS	1.4467 (0.8360)	-	12.8589 (0.0120)	6.4863 (0.1657)	-0.2134 (-3.6691)
MS	4.0506 (0.3992)	20.4208 (0.0004)	-	21.2669 (0.0003)	-0.1097 (-1.6857)
YS	3.5713 (0.4671)	0.8782 (0.9277)	9.0292 (0.0604)	-	0.0379 (1.3216)

Notes: [a]The values in parentheses are the probabilities. [b]The values in parentheses are the t-statistics.

Table 3: Granger Causality Tests - United States

	YM[a]	XUS[a]	MUS[a]	YUS[a]	ECM[b]
			Wald Statistics		
YM	-	0.6368 (0.7273)	5.4201 (0.0665)	5.5831 (0.0613)	-0.0144 (-0.4006)
XUS	2.8520 (0.2403)	-	4.2636 (0.1186)	4.4134 (0.1101)	0.0659 (1.0962)
MUS	3.7026 (0.1570)	2.2404 (0.3262)	-	0.7362 (0.6921)	-0.1457 (-2.4221)
YUS	0.7254 (0.6958)	0.4559 (0.7961)	2.4797 (0.2894)	-	0.0169 (1.8988)

Notes: [a]The values in parentheses are the probabilities. [b]The values in parentheses are the t-statistics.

Table 4: Granger Causality Tests - Japan

	YM[a]	XJ[a]	MJ[a]	YJ[a]	ECM[b]
			Wald Statistics		
YM	-	1.1271 (0.8900)	11.4854 (0.0216)	6.8135 (0.1461)	-0.0710 (-1.4093)
XJ	2.9875 (0.5599)	-	5.4359 (0.2454)	11.8439 (0.0186)	0.1526 (0.0668)
MJ	3.7974 (0.4341)	7.3915 (0.1166)	-	9.6056 (0.0476)	0.0919 (1.5882)
YJ	1.1426 (0.8875)	5.4382 (0.2452)	6.1157 (0.1907)	-	0.0496 (3.2667)

Notes: [a] The values in parentheses are the probabilities.
[b]The values in parentheses are the t-statistics.

CONCLUSION

Though the structure of Malaysia's trade has changed fairly significantly over the last three decades, the direction of Malaysia's trade remains more or less the same. ASEAN, the EU, East Asia, the US and Japan continue to be Malaysia's major trading partners. Nevertheless, their relative importance as Malaysia's trading partners has changed. The most significant is the declining importance of the EU due to the slowdown in trade flows with the UK, Malaysian former colonial master. On the other hand, trade with the US and East Asia have strengthened, leading to their rising market shares in Malaysia's external trade.

The results of Granger-causality tests suggest that there is no direct causal links between Malaysian exports and economic growth. Japanese income unidirectionally causes Malaysian exports but the evidence does not indicate that the exports causes domestic income. On the other hand Malaysian imports from Japan causes Malaysian income. In the case of the United States both of the United States exports to Malaysia and Malaysian imports from the United States cause Malaysian domestic activities but they are significant only at 6 percent level. The results for Singapore indicate that Malaysian exports to Singapore causes the imports from Singapore to increase and this increases Malaysian domestic activities but the causality between exports and imports is bidirectional.

REFERENCES

Al-Yousif, Yousif K.1999. On the role of exports in the economic growth of Malaysia: a multivariate analysis. *International Economic Journal*, 13, 67 – 75.

Bhagwati, J., *Protectionism, Cambridge*, Massachusette, MIT Press, 1988.

Buffie, E., 1992. On the condition for export-led growth. *Canada Journal of Economics.* 25, 211-225.

Dickey, D., Fuller, W., 1979. Distribution of the estimators for autoregressive time series with a unit root. *Journal of American Statistical Association.* 74, 427-431.

Dodaro, S. 1993. Exports and growth: A reconsideration of causality. *Journal of Developing Areas* 27, 227-244.

Doraisami, A. 1996. Export growth and economic growth: a re-examination of some time series evidence of the Malaysian experience. *Journal of Developing Areas* 30, 223-233.

Eithier, W.J., 1982. National and international returns to scale in the modern theory of international trade. *American Economic Review* 72, 389-405.

Engle, R.F., Granger, C.W., 1987. Co-integration and error correction: representation, estimation and testing. *Econometrica* 55, 251-276.

Feder, G., 1982. On exports and economic growth. *Journal of Development Economics* 12, 59-73.

Grossman, G. and E. Helpman*, Innovation and Growth in the Global Economy*, Cambridge, Massachussette: MIT Press, 1991.

Johansen, S., 1988. Statistical analysis of cointegration vectors. *Journal of Economic Dynamic Control* 12, 231-254.

Johansen, S., Juselius, K., 1990. Maximum likelihood estimation and inference on cointegration with Application to the demand for money. *Oxford. Bulletin of Economic Statistics* 52, 169-210.

Jung, W.S., Marshall, P.J., 1985. Exports, growth and causality in developing countries. *Journal of Development Economics* 18, 1-12.

Marin, D., 1992. Is the export-led growth hypothesis valid for industrialized countries? *Review of Economics and Statistics* 74, 678-688.

Michaely, M., 1977. Exports and growth: an empirical investigation. *Journal of Development Economics* 40, 49-53.

Phillips, P., Perron, P., 1988. Testing for a unit root in time series regression. *Biometrika* 75, 335-346.

Rivera-Batiz, L., Romer, P., 1991. Economic integration and endogenous growth. *Quarterly Journal of Economics* 106,531-556.

Romer, P., 1990. Endogenous technological change. *Journal of Political Economy* 98, 71-102.

Romer, P.M., 1986. Increasing returns and long-run growth. *Journal of Political Economy* 94, 1002-1037.

Stock, J., Watson, M., 1988. Testing for common trends. *Journal of American Statistical Association* 83, 1097-1107.

Thornton, J., 1996. Cointegration, causality and export-led growth in Mexico. *Economic Letters* 50, 413-416.

Impact of Intellectual Property Protection, Domestic Market Condition and R&D Expenditure on Foreign Direct Investment Inflow:
A Preliminary Evidence in Selected Cross-Countries Data

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ABSTRACT

The focus of this paper is to highlight and provide an empirical investigation of the impact for the first five years period after the implementation of TRIPS agreement. This study used a cross-country data for the mixed periods (1996-2000) to see of the impact of selected designed institutional factor viz. patent protection and domestic market conditions and the intensity of research and development (R&D) activity on the inflow of foreign direct investment (FDI). Using the cross country data analysis for the selected 56 countries, we found that with stronger patent protection and R&D concentration ratio for the sample selected countries is one of the significant factors affecting FDI inflow. The investment in FDI is rather mixed in view of countries development level, IP strength, R&D intensity and domestic market transparency. For developed countries, all the simple effect two way interaction contribute significantly to the FDI. We conclude with three potential options; (1) *Move towards to provide more efficient IP protections,* (2) *Intensifying technological research and development program;* and (3) *Working towards combating illegal activity.* For this last option, developing countries were still behind due to insufficiency of intellectual property law enforcements.

INTRODUCTION

Intellectual property - IP (or human creation or creativity) in his old fashion protected under Paris Convention, 1883 which consist of two main property namely industrial property and copyright, administered by the World Intellectual Property Organization (WIPO). The objective of WIPO of is to promote the protection of intellectual property among members throughout the world. Started as early as 19th century, IP protection nowadays, entering even more challenging global phase when both WIPO and World Trade Organization (WTO)[1] has agreed to include such property as a trading items (considered as a product) via Trade Related Aspect on Intellectual Property Protections (TRIPS) agreement effectively came into force in January 1 1996[2]. Under such comprehensive agreement, country members are given one year (for developed countries) up to four years (developing countries) to comply and upgrade (i.e. Article 65.1 and Article 65.2) their existing IP law and practices in order to meet the ceiling standard of protection requirement [3].

Due to the rapid growth for both creations and trade activity involving inventions and innovations product (or process) from developed (North) to developing countries (South), the impact of TRIPS agreement during and after the transition periods became an important issues to be examine, though it is too early to do so.

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[1] WTO was concluded in April 14, 1994 (of the Marrakesh agreement) and entered into force on January 1, 1995.
[2] The agreement between WTO and WIPO was concluded in Geneva on December 22, 1995, and entered into force on January 1, 1996 [Article 5, WIPO-WTO Agreement 1995]
[3] For developed countries, the transitions periods ended on 31 December 1996 and for developing countries member the transitions periods ended on 31 December 1999. However with subject to Article 1 of TRIPS agreement, members may or may not obliged to implement in their law more extensive protection than is required as long as such protection does not contravene the provisions of the agreement.

Policymakers in each countries member continuously put forward their effort to formulate effective and efficient strategy and practices not only to comply for but more importantly to reap such benefits that had been proved from the industrialized countries experiences. As highlighted under Article 7 of the (TRIPS) agreement:

> *"The promotional of technological innovation and transfer and dissemination of technology will hopefully benefit such users and producers so as to reach the conducive social and economic welfare with balanced rights and obligation."*
> *(WIPO: 1996, Pp.18)*

To balance the benefits between the North (developed) and South (least-developed one) provision under the Article 66.1 and 66.2[4] of the agreement had been further specified and specifically for South regions to create a sound and viable technological base with subject to incentives provided by the North regions (developed) members.

The paper is organized as follow. Section 2 discusses the objectives and methodology used in the paper and review previous literatures on the matter under study. Section 3 scrutinizes the issues of industrial development progress as an impact of advancement of IPR through foreign direct investment (FDI). Section 4 critically assesses the theoretical framework used in the analysis. Section 5 will draw the analysis, which contains the empirical results and concluded with Section 6.

OBJECTIVES OF STUDY

This paper interested to study the importance of economic function of the patent protections for the dynamic performance of the cross-country economy. The analysis involving random observation started from 1996 up to the year of 2000.

The objective of this paper is to analyze the significance impact (though it is too early to provide conclusive evidence) of IP protection to FDI inflow for selected cross-countries samples from the stipulated time periods under the TRIPS agreements. Two designed institutional factors opted i.e. patent protection index (IPRS) and black market index (BMI). The IPRS is an indicator for levels of protection (i.e. standard protection derived from the book of law) to the inventors of newly invented products or process with limited[5] monopoly powers to exercise his/her rights. The BMI is view as the transparency of the domestic markets conditions. If, for certain countries, the black market activity (illegal transaction) exists in the economy, the incentives and benefits left to the investor are violated due to high implementation cost. The R&D intensity included in the analysis as to identify on what consequences might turn up to FDI investment.

The interaction between explanatory variable will also be examined. The interaction between variables in the analysis will give different view of what level of FDI might exist given a country level of protection, ceteris paribus. This motivates us to examine on how the interactions of those variables might associate each other in order to achieve the momentum to speed up the economic development process.

An analysis involving developing nations will also be conducted to assess the implications of such factors in viewing the FDI impact given sets of determinants. The advantage of strengthening IP level especially for developing nations, given the existence of other factor will give different options and approach in promoting and enhancing their foreign investment policies and preparation that need to be taken if these nations get in touch with desired certain level of development.

METHODOLOGY

In this research, combinations of descriptive analysis will be used to analyze the data. Since set of data used is cross sectional obtained from secondary sources include sets of cross countries variables, therefore regression analysis technique is derived with several extension model to capture the behaviour of independent variables through extended regression analysis. The regression model will be fine-tuned to detect and correct the existence of multicollinearity, heteroscedasticity and autocorrelation (if any) as well as functional problem as a

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[4] Article 66 of TRIPS agreement is complemented by Article 65 with subject to the provision of Article 3, 4 and 5 in order for these countries to fully comply with the agreements.

[5] Granted patent holders are given limited monopoly power to exercise their rights. As a standard protection, according to the TRIPS agreement under Article 33 with subject to exclusive rights conferred which clearly stated under Article 28. For the purposes of this study the standard clause of limited powers which was designed by Park and Ginarte (1997) were mainly referred to years of protection i.e 20 years upon filing the application and 17 years upon granted.

pre-requisite to the classical assumptions. An extension of the model is to assess the possibility of different development level using several construct dummy variables.

DATA AND MEASUREMENT

This estimation involving cross-country data for 56 selected countries. The selection of countries is limited by the available information for the selected variables. The data are obtained from various sources. The data for inflow of FDI were obtained from United Nation Conference on Trade and Development (UNCTAD, 2003). All data quoted in $US million Dollars for the respective reported years. The R&D expenditure is obtained from UNESCO Institutes of Statistic which are also available online. The R&D expenditure data are quoted as a percentage of Gross National Product (GNP) for each country set. The patent protections index value for the year of 2000 is obtained from Park and Wagh (2002)[6]. Since the selected countries taking periods from 1996 up to the year 2000, therefore indices for the year 1996, 1997, 1998 and 1999 for each country sample were calculated using the same framework used by the authors. The black market index is obtained from Gwartney et.al, Economic Freedom of the World (various issues).

PREVIOUS LITERATURES

Previous studies on IP protection to economic growth are contentious. An argument among researchers, academicians and policymakers to the previous empirical work has given rooms for other researcher to uncover the new evidence especially issues involving cost and benefits of providing strong IP framework (Rapp and Rozek, 1990). These sections will provide a context for analysis and as a platform to identify the impact for the issues that cover in this paper. The literatures developed in this paper vary in various related topics and discussions. The main concern is to identify the mechanisms process provided by the stronger IP framework given other factors remained intact.

Historically, the speed up process vary from country to country due to different economic development progress[7], level of new technological and/or knowledge stock[8], accessibility of infrastructure, availability and dissemination of information and other economic environment including international trade policy, political stability and even culture. In viewing the mechanisms, the existing literature constructed as follows: <u>Firstly,</u> the literature shows the evidence on how the IPRs affect economic growth and productivity. <u>Secondly,</u> identified the possible benefits of such process as a result of strengthening the IP framework and <u>finally,</u> the discussion proceeds with some evidence from other relevant perspectives (i.e positive and normative) including economic transparency and cultures differences.

The ultimate documented agreement (TRIPS-Article 7; WIPO, 1996) gave an opportunity for South (developing nations) to reap the benefits, which has already experienced from the North (developed nations). The details of the provision critically discussed by among other, Paras Gorasia (2002), Ganguli (1998), McCalman (2001) and Lall (2003).

Gould and Gruben (1996) found that stronger patent protection significantly affect the economic growth especially in an open economies, which denotes by the interaction between patent protection and dummy trade policy variables (i.e represent by black market premium, real exchange rate distortion and comprehensive trade index).

Eaton and Kortum (1996) found the evidence from 19 sample set of OECD countries. Each of the OECD countries in their analysis share the same rate of relative productivity which induced from the innovation activity and emphasis that half of the growth in the selected OECD countries in the sample set were driven by the innovation activity originated from the United States, Germany and Japan. Moreover, Maskus and McDaniel (1999), also found the same conclusion where the technology diffusion through the post war Japanese patent

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[6] A detail of the original work by Park and Ginarte (1997) is based on the index calculated from five main categories of patents book of law. (1) Extent of coverage, (2) membership in international patent agreements, (3) provisions for loss of protection, (4) enforcement mechanism and (5) duration of protections. However, according to Park and Ginarte (1997), the indexes are sensitive to weighting. (Pp. 288).

[7] Different economic development progress can be viewed according to classification made by United Nation (i.e. categories divided into groups of developed and developing countries) or classification made by The World Bank (i.e. countries groups into level of income categories)

[8] Also refer as human capital stock.

protection system had significantly affect the total factor productivity (TFP) of Japanese economy through the innovation process.

Kwan and Lai (2003) however provide the extended analysis (i.e. using dynamic general equilibrium) on the impact of IP to economic growth and welfare to the US economy. Their analysis found that the welfare loss were substantial (i.e. involving the current consumption) as a results of under-investment in R&D due to under-protection of IPRs.

The process of economic growth induced by many factors, and among the researcher, they believes that the development process were driven mostly by the process of technology ownership (among others) brought from the FDI process. However the technology ownership will only exists when IP framework strongly enforced in such countries.

THE ROLE OF FDI IN INDUSTRIAL DEVELOPMENT

Countries Industrial development, among other things, closely linked to the ability of an industry to produce output through internal (domestic) and external (foreign) investment sources through an attractive (or effective) investment policies. Report from United Nations Conference on Trade and Development (UNCTAD, 2003), it is clear, at least four possibilities or situation when comparing countries FDI performance (inward) and potential.
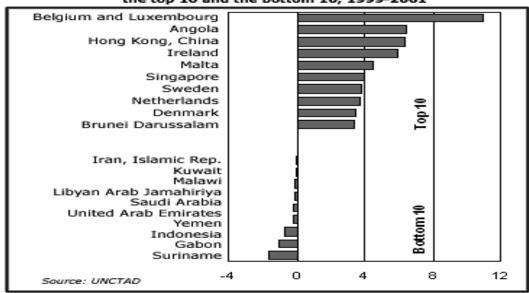
Table 1: Matrix of Inward FDI

	HIGH FDI PERFORMANCE	LOW FDI PERFORMANCE
HIGH FDI POTENTIAL	Front-runners (I)	Below potential (II)
LOW FDI POTENTIAL	Above potential (III)	Under-performers (IV)

Source: UNCTAD (2003)Notes: FDI performance and FDI potential are measured by an index and each cell value measured by taking various factors.

Table 2:

The UNCTAD Inward FDI Performance Index, by host economy : the top 10 and the bottom 10, 1999–2001

By taking two extreme comparisons, group (I) and (IV), i.e. countries with "high FDI performance" and "High FDI potential", most of the countries included in group (i) are newly industrializing and advanced transition economies, however the latter [group (IV)] mainly consists of poor economies (including all South Asian economies, poor and least developed countries, along with Turkey).

Benchmark made by the UNCTAD taking periods 1999-2001(Table 2), found that for Bottom 10 group, the inward performance index are very small or almost zero to negative (with score index between -1.613 and -0.016, except for Iran, Islamic Republic, 0.001)
Studies found that level of FDI (shortly investment) received by host countries in developing and least-developed region are determined by three factors (or advantages which direct investment should have by the institutions) namely ownership, locations and internationalizations (Dunning, 1980)

An ownership advantage is described by the advantage which firm has over its rivals in terms of intellectual property ownership (i.e trademarks or brand name and patent) or knowledge or marketing. Locations advantage however described by the advantage derived from the host country's comparative advantage or its transaction cost including the absence of a tariff on the product if produced in the host country. Internationalizations factors are the value judgment or consequences approach on what types of investment package should be channeled to the host country.

Borensztein et.al (1998) which was inspired by the endogenous growth model through the technological progress of capital deepening process has found the evidence on how FDI from industrial countries become an important vehicle for developing countries to achieve better foundation to lift up economic growth conditionally to the human capital stock avail by the host countries. Markusen and Venables (1999) however found some linkages (forward and backward) on how FDI largely become a catalyst for local industrial development. The research is based on the analysis of input-output framework.

ATTRACTING FDI: THE ROLE OF GOVERNMENT

Rapid economic developments over the past three decades change view of many developing and least-developed countries to the importance of FDI through an aggressive campaign of investment promotions to attract investment. According to Dean (2000), the successful story of Singapore in the early 70's through an aggressive campaign to attract foreign multinational company (especially from United States of America) has changed their economic landscape from least resources country to Newly Industrialized Economies (NIEs[9]). The important role of FDI to industrial development in developing country also changed Botswana[10] economic outlook from a least developed country status to middle-income country[11] (UNCTAD, 2003).

However, the important role of FDI to industrial development much depends on countries policies reforms (Wint and William, 2002) and other internal factors as viewed by Gastanga et.al (1998), Smarzynska and Wei (2000), Janeba (2001) and Wei and Wu (2001). Gastanga et.al (1998) examines the issues from the perspective of host country reform specifically involving the majority of less-developed countries. By applying the perspective of the "eclectic theory"[12] for international investment, the authors found that host country policies are capable of influence FDI inflows primarily through the advantages of location aspect in the host country. The authors used multivariate analysis using pure cross-section and panel data fixed effect estimation for 49 less-developed countries over 1970-95 involving two different sources of FDI data with two different measures of capital control. However, the results from both analyses were slightly different due to complementary between various elements of investment climate and this might be overstates the effectiveness of individual policy reforms.

Wint and Williams (2002) in view of the role of government in developing countries in attracting FDI through promotional activities found that level of development has become a significant factor. They emphasize that functional policy (rather than selective) especially to developing to promote investment activities. However, due to data limitations their empirical analysis does not provide such support.

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[9] NIEs include Singapore, Hong Kong, South Korea and Taiwan. These group also known as Asian Tigers among economist.

[10] Botswana has never had a foreign law but has welcomed FDI in almost all area.

[11] The country income classification s produced by World Bank in July 2003 and effectively until July 2004. For details income country classification visit: www.worldbank.org

[12] The "eclectic theory" which was used by the authors is divided into three sets of advantages which direct investment should have over the other institutional mechanisms available to the firm for satisfying the needs of its customers at home and abroad. The three factors namely ownership, location and internationalization (i.e. OLI) which was pioneered by Dunning (1981)

INTEGRAL PART OF ROLE OF RESEARCH AND DEVELOPMENT (R&D) AND TECHNOLOGICAL TRANSFER (TT)

Research and Development activity (shortly R&D) or innovation oriented efforts are becoming a major engine for technological progress (Coe and Helpman, 1995). Source of innovation activity could be from domestic R&D capital and also from foreign R&D capital. The R&D activity is an integral part of level of technological transfer through internalize of FDI (UNCTAD, 2003). The rapid R&D activity as a consequence of rapid FDI, viewed as a <u>pull factors</u> for investors to invest in high technology industry through an attractive package (i.e licensing and other contract arrangements and strategic alliances between local and foreign firms). For the end result the TT effect will definitely spillover into the industries and extensively assimilates to promote sound and viable economic growth in the host countries.

There are at least three (i.e interrelated) channels or source of TT. Firstly, licensing (Eaton and Kortum, 1996), secondly through FDI (Borensztein, De Gregorio and Lee, 1998) and last but not least, international trade (Markusen and Venables, 1999 and Markusen, 2000). Researcher like Coe and Helpman (1995), Gustavson et.al (1999), Serapio and Dalton (1999), Bayoumi et.al (1999), Takalo and Kanniainen (2000), Wakelin (2001), Fosfuri et.al (2001), and Varsakelis (2001) has their own view on the issues. Coe and Helpman (1995) believe R&D is one of the major engines for growth. However the presence of local externalities through local R&D stock (Gustavson et.al, 1999) is one of the determinant factors for competitiveness as well as stock of knowledge from total R&D in the domestic industry. The importance of supply factors in influencing a company's foreign investment decision in R&D is conducted by Serapio and Dalton (1999) and the importance of R&D spending, R&D spillover and trade in boosting growth in industrial and developing countries (Bayoumi et. al, 1999) had proved to increase total factor productivity.

Study conducted by Takalo and Kanniainen (2000) found that a commitments to an R&D project are capable to create future option for patenting and market introduction that influence in promoting productivity growth when firm's own R&D expenditure taking into account (Wakelin, 2001). Varsakelis (2001) however found that R&D investments are significantly determined by national culture in an open economic region with strong patent protection. Up to this point, most studies relating the FDI to R&D spillover, among other things, are interconnected with other various factors. As noted by UNCTAD (2003) in his World Investment Report 2003 believed that FDI is still become an important channel for TT even though global FDI flow for all region in 2002 were recorded decline.

The ambiguities in the empirical analysis concerning standardizing patent protection among nations provide some room and opportunities for researchers, academicians and policymakers to continuously investigate other factors as to further developed and enhance the analysis. International treaties (i.e TRIPS agreement) provide comprehensive and standardize framework (i.e under Article 7) to harmonize cum minimize the residual gap for both north (well developed) and south (less developed) country's productivity and level of technological transfer.

Most empirical studies found that, economic growth (as a measure of productivity) is endogenously driven, inter alia through input factors (Solow,1956) and technology only assimilates through the process of capital accumulation and human capital creation exogenously to the model to indirectly measure productivity (Mankiw et.al.1992; Miller and Upadhyay, 2000). But nowadays the effect of technology to economic growth shared among nations at least by several channels inter-alia trading, licensing, and foreign investment. Maskus and Penubarti (1995), first uncover the (little) importance of patent protection framework to bilateral trading flow (especially imports) between developing nations as an increase of patent protection. Moreover, Smith (1999, 2001) found the sensitivity of unidirectional evidence of exports flow to difference function of patent protection level. Due to the growing trade pattern of high technological product, trade opportunities have benefited nations especially to at least accumulate technological know-how as an alternative channel to energize growth's speed up process.

Stringent protection, among developing and less-developing countries has at least delaying the innovation creativity initiated from developed countries. Eaton and Kortum (1996), found evidence that 50% of growths in the OECD countries are facilitated by an invention and innovations originated from developed countries such as United Stated, Germany and Japan. Japan has experiencing an upward trend in technical progress (post war growth) due to an effort and progress of enhancing patent framework (Maskus and McDaniel, 1999). Liu and Wang (2003) link the mechanism possibility between foreign direct investments (FDI) to total factor productivity (TFP). They believe that according to endogenous growth model theory, TFP is assumed to be synonymous to technological progress that assimilates through FDI flow. Markusen and Venables (1999) found

evidence of some linkage effects in local industry development where FDI has shown formally as an industrial catalyst.

A lack of transparency, less degree of openness, high country risk, black market activity, exchange rate distortion, high tariff rate and strong barrier and corruptions (widely blamed) have impediment power through various ways. Researchers, Gould and Gruber (1996), Smarzynska and Wei (2000), Wei and Wu (2001), Park and Lippoldt (2003), Gastanga et.al (1998), Paldam, M (2002) and MO, Pak Hung (2001) agreed that those factors are examples of self-created distortion instrument which silently retards the economic progress, especially in attracting foreign investors.

Good governance or institutions are measured by the efficiency of how one authority allocates resources efficiently from being exploited by legally private-interest agents. As purposed ideally by laissez faire system, allocations of factors are efficiently distributed through the pricing system mechanism. However, due a bureaucratic maze the effectiveness of economy delivery system in formalizing open macro economic policies becomes inefficient (Bai and Wei, 2000) especially in attracting foreign investment (Gelos and Wei, 2002). Other studies conducted by Hines (1995) and Wei (1997a, 1997b and 2000), conclude with the same finding[13].

THEORETICAL FRAMEWORK

From the previous empirical studies, the expected sign for each coefficient can now be formalized. Both coefficients for IP protection level and ratio of R&D expenditure to GNP are expected to be positively correlated to FDI. However, BMP variables negatively related to FDI.

To analyze the impact and magnitude of the said factors, this paper proceeds with the development of an econometrics model as describes below.

$$y_i = \alpha_0 + \alpha_i \chi_i' + u_i \qquad \text{(Eq.1)}$$

y_i = Inflow of FDI by foreign investors

χ_i = A sets of explanatory variables namely Patents protection index (IPRS), Black Market Index (BMI) and domestic R & D expenditure (RDEXP).

By following the properties of Classical Linear Regression Model assumption (CLRM), it is worth to noted here that the conditional expected value for the error term are zero and follows the homoscedasticity distribution as shown by the respective equation $E(u_i \mid \chi_i) = 0$ and $var(u_i \mid \chi_i) = \sigma^2$.

The coefficients for IPRS and RDEXP are hypothesizing positively related to FDI, however BMI inversely related to FDI inflow to the host countries. We also look into the possibility of dummy interaction within and between the explanatory variables. Since the data set is involving a cross country sample, therefore another dummy variable to capture country specific development level will be constructed using the newly release World Bank income classification (as of July 2003) to find out the effect of FDI investment accordingly to the income classification. The construction of dummy variable is explained in the subsection 4.2.1.

Since all data were obtained from various sources, countries involved in the sample set were different in historical records, intensity and development levels, therefore heteroscedasticity problem suspected to exist in the model. The heteroscedasticity problem moreover will invalidate (biased) the variance dispersion for each coefficient in the model and the usual reported statistics produced by the usual OLS procedures unfortunately no longer distribute accordingly to the CLRM assumption. In short, the statistics methodology used to test hypothesis under the Gauss-Markov assumption are less valid in the presence of heteroscedasticity[14]. This problem usually reported by many researchers when dealing with cross sectional and cross-country data. As an alleviate measure, we will perform White Heteroscedasticity-Consistent Standard Error and Covariance.

The existence of heteroscedasticity indicate that some sort of functional problem. Therefore regression specification error test (RESET) developed by Ramsey's (1969) will be conducted. Although the RESET test only can detect and identify such misspecification but the heteroscedasticity problem occurred in the model still not corrected. Therefore to deal with the problem, again White (1980) heteroscedasticity methodology test came

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[13] However, Alesina and Weder (1999) did not found any empirical evidence when study about "Do Corrupt Governments receive less foreign aid".
[14] Wooldridge, J.M (2003)

into practice. We will also perform autocorrelation test to detect some space correlation of the residual in the model.

MODEL CALIBRATION AND HYPOTHESIS DEVELOPMENT

In this section we will discuss the empirical model suggested in the previous section. The suggested equation will be estimated for each cross-country denoted by subscript i. The model is as follow:

$$\ln FDI_i = \alpha_0 + \alpha_1 \ln IP_i + \alpha_2 \ln RND_i + \alpha_3 \ln BMI_i \qquad (Eq.1.1)$$

Each of the variables transformed into its logarithm form to allow for percentage impacts to the estimated coefficients. FDI_i[15] is the inflow of FDI in the reporting (host) economy comprises capital provided (either directly or through other related enterprises) by a foreign direct investor to an FDI enterprise resident in the economy. $IPRS_i$ is the unweighted patents protection strength framework, which was developed by Park, and Ginarte (1997) using standard patent book of law and BMI_i[16] is the black market index as a proxy to transparency level and efficiency of the domestic market. Both $IPRS_i$ and BMI_i are the example of designed institutional factors that governed by the government of each receiving countries. The black markets activities in reality are sometimes beyond the government's control, but with strong enforcement, regulation and continuous monitoring process it will reduce such activity.

The hypothesize sign derived in Eq.1.1 are as follows:
$$\alpha_1 > 0, \ \alpha_2 > 0, \ \alpha_3 < 0$$

To examine the interaction term and its effect to inflow of FDI, we developed eleven extended models to the equation Eq (1.1).

Construction of Dummy Variables

The process of regroup the explanatory variables into its dummy value are quite simple. We start the process by identifying the normality distribution of all variables. To test for normality distribution for each of explanatory variables, we apply the Anderson-Darling, A^2 procedure. The Anderson-Darling, A^2 statistics for all explanatory variables are presented in the summary statistics Table 5.1.

If all the variables normally distributed around its mean value, therefore we will use its mean value as a balanced-point measurement of distributions to regroup the variables. However if all the variables are found skewed or does not normally distributed around its mean, we will use median value as a center of distribution to regroup the variables.

Simple Effect Two-Way Dummy Interactions Model

For the interaction term between the dummy variables (i.e categorical variables) with other explanatory variables (i.e continuous variables), we developed twelve extended model for each dummy groups variables.

$$\ln FDI_i = \alpha_0 + \alpha_1 \ln RND_i + \alpha_2 \ln BMI_i + \alpha_d \sum_{d=0}^{1} Dip + \alpha_{di} \ln IP_i \sum_{d=0}^{1} Dip \qquad (Eq.1.2)$$

The above equation examines the effect of level of FDI inflow for each group given the level of IPRS and assuming other explanatory variables unchanged. The coefficient α_{di} denotes the effect level of FDI received by the countries.

$$\ln FDI_i = \alpha_0 + \alpha_1 \ln IP_i + \alpha_2 \ln BMI_i + \alpha_d \sum_{d=0}^{1} Dip + \alpha_{di} \ln RND_i \sum_{d=0}^{1} Dip \qquad (Eq.1.3)$$

$$\ln FDI_i = \alpha_0 + \alpha_1 \ln IP_i + \alpha_2 \ln RND_i + \alpha_d \sum_{d=0}^{1} Dip + \alpha_{di} \ln BMI_i \sum_{d=0}^{1} Dip \qquad (Eq.1.4)$$

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[15] For explanation of FDI inflow used in this paper, refer to UNCTAD Handbook of statistics which are available online at http://stats.unctad.org/
[16] BMI value is actually adapted by the authors from survey conducted on the Transparency International's Corruption Perception Index which taking ordinal value 1 through 5.

The interactions of Dummy IPRS with other explanatory variables are represented by (Eq.1.2), (Eq.1.3) and (Eq.1.4).

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{RND}_i + \alpha_2 \ln \text{BMI} + \alpha_d \sum_{d=0}^{1} \text{Dbmi} + \alpha_{di} \ln \text{IP}_i \sum_{d=0}^{1} \text{Dbmi} \quad \text{(Eq.1.5)}$$

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{IP}_i + \alpha_2 \ln \text{BMI} + \alpha_d \sum_{d=0}^{1} \text{Dbmi} + \alpha_{di} \ln \text{RND}_i \sum_{d=0}^{1} \text{Dbmi} \quad \text{(Eq.1.6)}$$

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{IP}_i + \alpha_2 \ln \text{RND} + \alpha_d \sum_{d=0}^{1} \text{Dbmi} + \alpha_{di} \ln \text{BMI}_i \sum_{d=0}^{1} \text{Dbmi} \quad \text{(Eq.1.7)}$$

The interactions of dummy BMI with other explanatory variables are represented by (Eq.1.5) and (Eq.1.7).

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{RND}_i + \alpha_2 \ln \text{BMI} + \alpha_d \sum_{d=0}^{1} \text{Drnd} + \alpha_{di} \ln \text{IP}_i \sum_{d=0}^{1} \text{Drnd} \quad \text{(Eq.1.8)}$$

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{IP}_i + \alpha_2 \ln \text{BMI} + \alpha_d \sum_{d=0}^{1} \text{Drnd} + \alpha_{di} \ln \text{RND}_i \sum_{d=0}^{1} \text{Drnd} \quad \text{(Eq.1.9)}$$

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{IP}_i + \alpha_2 \ln \text{RND}_i + \alpha_d \sum_{d=0}^{1} \text{Drnd} + \alpha_{di} \ln \text{BMI} \sum_{d=0}^{1} \text{Drnd} \quad \text{(Eq.1.10)}$$

The interactions of dummy RDEXP with other explanatory variable are represented by (Eq.1.8), (Eq.1.9) and (Eq.1.10) above.

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{RND}_i + \alpha_2 \ln \text{BMI}_i + \alpha_d \sum_{d=0}^{1} \text{Dinc} + \alpha_{di} \ln \text{IP}_i \sum_{d=0}^{1} \text{Dinc} \quad \text{(Eq.1.11)}$$

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{IP}_i + \alpha_2 \ln \text{BMI}_i + \alpha_d \sum_{d=0}^{1} \text{Dinc} + \alpha_{di} \ln \text{RND}_i \sum_{d=0}^{1} \text{Dinc} \quad \text{(Eq.1.12)}$$

$$\ln \text{FDI}_i = \alpha_0 + \alpha_1 \ln \text{IP}_i + \alpha_2 \ln \text{RND}_i + \alpha_d \sum_{d=0}^{1} \text{Dinc} + \alpha_{di} \ln \text{BMI}_i \sum_{d=0}^{1} \text{Dinc} \quad \text{(Eq.1.13)}$$

The interactions of dummy income classification with other explanatory variables are represented by (Eq.1.11), (Eq.1.12) and (Eq.1.13).

To avoid fall into dummy variable traps, one group will be selected as a base or comparison group. Therefore for any effect to FDI, each group has its own unique intercept in explaining the level of FDI inflow.

Now the interaction of each dummy gives a simple effect and magnitude to the FDI, therefore the discussion will in fact discuss mainly into the issues of how these interactions affect and attracts the investment level into the certain group of countries, ceteris paribus. The signs of coefficients of α_{di} for each dummy interactions group can be either positive or negative. The positive (negative) sign denotes the simple effect level of FDI higher (lower) compared to other group of countries in each analysis.

The suggested model above were developed after taking into account of various factors (i.e issues covered in the literature review section) and hopefully to reach the conclusion of what were actually the impact of FDI inflow as an impact from the TRIPS agreement for different sets and specific characteristic of countries that largely depends on FDI in assessing full potential of economic growth (Park and Ginarte, 1997)

Model developed in (Eq.1.1) is principally a benchmark model. Sets of equations which started from (Eq.1.2) through (Eq.1.13) were developed and main concern is, as the model enhances and developed, the complexity of FDI impact will be revealed. The interaction term for each equation will give the explanations of why some countries received massive FDI compared to some other and what benchmark that investors look for when deciding to invest in certain counties given other factor unchanged as explained in (e.q.1.1).

ANALYSIS

The primary purpose of this paper is to examining the impact of inflow of FDI as an effect of increasing of patents right protection index (IPRS) as stipulated in the TRIPS agreement[17].

Table 3 and Table 4 represent the summary statistics (including the Anderson-Darling A^2 statistic) and correlation matrix for each of the variable used in the model. The variable used in the model exhibit heteroscedastic pattern especially involving FDI since data were obtained from cross-country sample and variations of variable are rather disperses. The preliminary examination about the nature of the data, motivate us to choose the appropriate model to examine the effect of FDI.

Table 3: Summary Statistics

	FDI	IPRS	RDEXP	BMI
Mean	17272.07	3.21	1.155	2.55
Median	3650.00	3.24	0.795	2.5
Maximum	195122.0	4.86	3.80	5.0
Minimum	13.0	0.92	0.01	1.0
Std. Dev.	35474.10	0.9101	0.9837	1.3740
Anderson-Darling, A^2 {p-value}[*]	9.62 {0.00}	0.67 {0.07}	1.97 {0.00}	2.45 {0.00}
CoV (σ/mean)	2.0538	0.2835	0.8516	0.5388
Obs	56	56	56	56

FDI, inflow foreign direct investment;
IPRS, patents protection index;
RDEXP, domestic R&D expenditure;
BMI, black market index
CoV, Coefficient of Variation: Exhibit the dispersion of the variable.
[*] the smallest p-value obtained from A^2 statistic, show that all variables are not normally distributed around its means at least at 7 %.

Table 4: Pearson Correlation Matrix

	FDI	IPRS	RDEXP	BMI
FDI	1.0000			
IPRS	0.4691	1.0000		
RDEXP	0.4451	0.6089	1.0000	
BMI	-0.3903	-0.6159	-0.6216	1.0000

ANALYSIS OF MODEL

An econometric model proposed in the previous section tested in order to identify the magnitude impact and its direction of what have been stipulated earlier. The results are as at Table 5.

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[17] Article 7, under objectives of TRIPS agreement 1994: WIPO Publication, No. 223(E)

Table 5: Cross-Country OLS Regression

Dep.variable (lnFDI)	OLS 1	OLS 2	OLS 3
Constant	3.2354	5.4132	6.5896
	$(0.8072)^{***}$	$(1.1463)^{***}$	$(1.3263)^{***}$
	$[0.9742]^{***}$	$[1.4028]^{***}$	$[0.9689]^{***}$
lnIP	4.2657	2.7703	-1.1418
	$(0.6921)^{***}$	$(0.8164)^{***}$	(2.4618)
	$[0.7896]^{***}$	$[0.9478]^{***}$	$[1.4840]$
lnRND		0.5652	0.4797
		$(0.2329)^{***}$	$(0.2345)^{**}$
		$[0.2097]^{***}$	$[0.2282]^{**}$
lnBMI		- 0.386576	-0.2343
		(0.4944)	(0.4943)
		$[0.5656]$	$[0.5643]$
$(lnIPRS)^2$			2.2487
			$(1.3377)^{*}$
			$[1.0651]^{**}$
Adj-R^2	0.4020	0.4863	0.5038
RESET	{0.0346}	{0.4211}	{0.9728}
Anderson-Darling A^2	{0.8557}	{0.8941}	{0.9865}
Wald test	-	5.30	4.4571
		$\{0.0072\}^{***}$	$\{0.0397\}^{**}$
White test	{0.1218}	{0.1172}	$\{0.0734\}^{*}$
Durbin-Watson d stat	2.0507^{***}	1.8305^{***}	1.7961^{***}
	$\hat{\rho} \approx -0.049$	$\hat{\rho} \approx 0.054$	$\hat{\rho} \approx 0.074$
No. of obs.	56	56	56

Note: (i) The usual OLS standard errors are in parentheses, ( ) and the heteroscedasticity-robust standard errors are in square brackets, [ ].
(ii) Value indicates with braces, { } is p-value.
(iii) Anderson-Darling A^2 is the normality test for predicted residual
(iv) The value of Wald coefficient test, White heteroscedasticity test and BG space correlation test are reported after the model corrected for the existence of heteroscedasticity.
(v) $^{*},^{**},^{***}$ Indicates the coefficients significant at 10%, 5% and 1% respectively.

For OLS (1) of Table 5, the usual standard error and robust standard error are reported in parenthesis and bracket, respectively. The coefficient for lnIP is statistically significant at least at 1 percent level for both robust and non-robust equations. As 1 percent increase in patent protection will increase the inflow of lnFDI to around 4 percent.

The OLS (2) equation conducted with including two additional explanatory variables and the robust and non-robust standard error reported in bracket and parenthesis respectively. The explanatory power of OLS (2) equation is around 48 percent. The sign of each variables parallel with earlier hypothesis. Two explanatory variables (i.e lnIP and lnRND) found significantly different from zero at least at 1 percent level and lnBMI is not. To test the significant of inclusion additional explanatory variables we apply Wald coefficient restriction test[18]. Wald test shows that both additional explanatory variables significant at least at 1 percent level and this is an indicator that the additional explanatory variables are belong to the model.[19]

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[18] The Wald test computes the test statistic by estimating the unrestricted regression without imposing the coefficient restrictions specified by the null hypothesis. The Wald statistic measures how close the unrestricted estimates come to satisfying the restrictions under the null hypothesis. If the restrictions are in fact true, then the unrestricted estimates should come close to satisfying the restrictions.

[19] As stated earlier, if heteroscedasticity exist in the model, it will misinterpret the results. Therefore, to confirm, we conduct White (1980) heteroscedasticity LM test (with cross term interaction). The chi square (χ^2_6) test fails to reject the null hypothesis of homoscedasticity at least at 11 percent level. Therefore, we might say that the heteroscedasticty robust version is now alleviated from heteroscedasticity problem.

The problem of sample first-order autocorrelation is also tested. The autocorrelation problem usually exists in time series observation, but it might exist in space for cross sectional observations. In this paper we conduct methodology developed by J.Durbin and G.S Watson (1951). The D-W test is only valid when the error term is assumed to be normally distributed. Since the normality assumption is not violated in the model, we found that for all model there is no first-order autocorrelation at least at 1% level.

As we extend the model (OLS 3), by taking quadratic term for level of lnIP, it is found that, the explanatory power for this model increase slightly (around 50 percent) and the squared terms for lnIP significant at 5 percent (non-robust version) and 10 percent (for robust version) respectively. Thus this indicating those as the level of protection increase, level of FDI would also increase significantly after reaching some threshold level. Therefore we suspect the IPRs protections and its relations to FDI thus far are explained by a non-linear relationship[20].

Since the analysis using double log model it cannot identify accurately the optimum level of IPRs protections. Therefore we construct simple analysis with several interval values for each of explanatory variables[21]. Then we map the interval value accordingly to the country sample sets. The interaction in the analysis now gives unique features of countries characteristics and its relations to inflow of FDI into the receiving countries respectively. It is worth to emphasize that as the model developed, the complexity of FDI impact will be revealed. The interaction term for each equation will give the explanations of why some countries received massive FDI compared to other and what benchmark that investors look for when deciding to invest in certain counties given other factor remain unchanged.

THE SIMPLE EFFECT TWO-WAY INTERACTIONS ANALYSIS

The eleven extended regression equations as describe in section 4.2 (involving E.q.1.2 to E.q.2.2), will be examined and tested for the selected 56 sample sets. However for simplicity the results presented as in Table 5.4 only provide the analysis for partial interaction between variables. Since the interactions terms differ by way of interpretations and implications to the host's countries, the remaining analysis will develop into several subsections and discussed intensely into this matter. To examine the interaction between explanatory variables and its effect to FDI inflow, we developed four groups' dummy variables involving patents protection level (i.e. DIPRS), domestic market condition (i.e. DBMP), income classification based on newly release data from World Bank as July 2003 (i.e. DINC) and R&D intensity (i.e. DRND).

Interaction on dummy IPRs (Dip)

The results of simple effect for each of interactions with construct dummy variables are mixed for all set of extended regression version. For level of IP strength for group [0], only countries below the median value grouped benefited from such interactions. However, group for [1] no significant interaction was found although the interaction sign fit with the theory. 27 countries were identified from group [0] benefited from such protections (i.e. significant at 10 percent level).

The R & D activity becomes significant as the level of IP protection increase. As depicted in table 6, level of R&D intensity started benefited from the return of investment when IP strength equal or above 3.24. Group [1] R&D concentration significantly contributes to FDI inflow at 5% level. For group [0], although the effect is positive but it was found insignificant. The significant relationship between protection levels to R&D activity has the similarity to the results found by Varsakelis (2001).

The simple effect interaction for group [0] irrespective for market transparency level is positive (i.e shows the reverse sign from the stipulated theory). Nothing much we could say on this situation, but as we reexamine the data set, we found that most of the countries in the IP group [0] were developing countries with lower level of market transparency. The impact to FDI inflow is negative for IP group [1] and significant at 10 % level.

Interaction on dummy R&D (Drnd)

For most of the cases, the interactions of Drnd variables enhance the analysis in terms sign and magnitude impact of FDI. Given the group of R&D activity, an increase in R&D at any level of IP strength effects of FDI investment also increases significantly for both R&D group [0] and [1]. However the significant simple effect interaction is highly recorded for group [0] at 1 % level compared to 10% level for group [1].

The level of R&D intensity for both groups is positive, but the significant effect from the sample set only significant for below median level of the low level of R&D activity group (i.e group [0]). For high level group [1] though it is found positive but the positive impacts were found insignificant.

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[20] This finding reveal that for the 56 sample involved in the analysis, the patterns of patent protections is some what follows the "U" shape analysis. However since the model consist of various countries and the equations developed are in double log analysis, we are unsure about the break point level of the IPRs. One possible measure to detect such break point is to divide the level of IPRs of those countries into its unique classifications.

[21] Including Dummy for income classifications as represented by E.q.2.0 to E.q.2.2

However the simple effect interaction for both Drnd group irrespective of market transparency level is found insignificant though the interaction sign meet the earlier expectations. The insignificant results between interaction terms coefficient are due to the specific characteristics of each group across country and observation in the sample set.

Interaction on dummy BMP (Dbmi)

For interaction between groups dummy BMP and other two explanatory variables, it seems that irrespective of level IP strength and R&D intensity, both group shows a positive and significant simple effect two way relationships.

For group [0] the positive relationship with IP strength is significant at 5% level and 1% level for group [1]. By given the level of IP strength, the negative impact of market transparency for any country falls under each group has been whip out by the stronger positive impact of IP level. This statement supported by the strong positive simple effect interaction for group [1]. Therefore the level of BMP in any certain country does not affect investment in FDI.

The interaction results between group dummies BMP irrespective of R&D level also shows a positive relationship. However the significant effect only recorded for group [1] and not for group [0]. Therefore once again, for group [1] BMP, market transparency distortions has fail to reverse the impact of foreign investment inflow by intensifying R&D activity at least for this selected sample set.

Interaction on dummy Countries Development (DLevel)

Level of income is an indicator for nation's development level and an increase in income, enhances the nation's standard of living and so the awareness of protecting the intellectual property rights are in optimal level. Therefore, to scrutinize the country specific development level, we use the latest World Bank income classification (as of July 2003) to examine the impact of countries inflow of FDI. The dummies for country's income are divided into five main groups' viz. high income-OECD, high income- Non-OECD, Upper middle income, Lower middle income and low-income countries. The interactions between countries development level with sets of explanatory variables viewed as an important perspective since it can reap better understanding about the nature of foreign investment flow.

For the purpose of this study, we regroup the income classifications into two groups. Namely group [1] for a developed country consists of high-income OECD countries and high-income Non-OECD countries and group [0] for developing countries consists of three income classifications i.e upper middle income, lower middle income and low-income countries.

For developed countries, all three simple effect interactions found significant in international investment inflow. The IP strength framework is significant at 1 %, R&D intensity significant at 5% level and market transparency only significant at 10% level. However for developing countries, we did not found enough evidence that market transparency distortion will affect the investment inflow. Strong evidence however found from the IP strength framework and R&D intensity activity where both significant at 1% and 5% respectively.

Table 6: The Simple Effect Two-way Interaction of Protection Level, Market transparency, Income Classification and R&D Intensity to FDI inflow

		lnIP	lnRND	lnBMI
$\sum\limits_{d=0}^{1} Dip$	[0]	1.7795 {0.090}*	0.4438 {0.135}	0.3814 {0.732}
	[1]	4.2361 {0.160}	0.6789 {0.040}**	-0.7643 {0.094}*
$\sum\limits_{d=0}^{1} Drnd$	[0]	2.2924 {0.002}***	0.5419 {0.035}**	-0.2421 {0.802}
	[1]	3.7283 {0.099}*	0.0334 {0.966}	-0.3791 {0.573}
$\sum\limits_{d=0}^{1} Dbmi$	[0]	4.2022 {0.017}**	0.1745 {0.680}	-0.0867 {0.924}
	[1]	2.0568 {0.003}***	0.6678 {0.006}***	-0.1279 {0.935}
$\sum\limits_{d=0}^{1} Dlevel$	[0]	1.8087 {0.005}***	0.6446 {0.013}**	-0.36781 {0.741}
	[1]	5.2187 {0.003}***	0.9137 {0.042}**	-0.9784 {0.086}*

Notes:

For dummy variable classifications;
[0]- observations below its median value
[1]- observations above or equal to its median value

Dip is dummy variable for level of protection
    [0]: 27 countries
    [1]: 29 countries

Drnd is dummy variable for R&D per GNP
    [0]: 34 countries
    [1]: 22 countries

Dbmi is dummy variable for domestic market transparency
    [0]: 28 countries
    [1]: 28 countries

Dlevel is dummy level of development based on Country Income Classification by World Bank
(as July 2003)
    [0]: 30 countries
    [1]: 26 countries

The sign with *,** and *** are the significant level at 10, 5, and 1 percent respectively.

CONCLUSION

The issues of uniform IP protection are ambiguous and contentious. Though it is common for the developed countries to protect their intellectual property through various IP law channels, but the extent to which protection can be expanded to the developing nations remain challenging.

The mode or choice of entry for investment (from the empirical analysis) for those countries is indeed unique. Some countries provide strong IP protection to just comply with the ceiling standard, which is put in order by the international treaty. Fully comply with the standard will provide them with better foundation and stronger benchmark as to promote economic development activity within highly protected business environment and strong science and technological activity. These become the explanations for the location advantage. Investors however need secure environment package as their best options or *modus operandi* to secure their investment portfolio. Highly protected market (stronger IPRs) provided by host's countries had been proved as a favorable strategies (Gould and Gruben, 1996) however IPRs itself is not the ultimate factors for a success attractions of FDI (Park and Lippoldt, 2003). This however becomes a superior strategy for investors to identify newly potential market and provide an opportunity for mutually benefited innovative activity between nations.

Over the several decades inflow of FDI into the developing nations by means of R&D activity however, not only reflected by a stronger patent protections. The gaming situation for developing countries during the compliance periods of TRIPS agreement is proved by the success achievement from the developed (OECD and Non-OECD) nations. For the periods of 1996-2000, evidently shows that developed countries have benefited from such protections as one of an instrument and strategy to attract FDI.

Lall (2003) provide the dynamic perspectives and strategic dimensions for the developing nations in competing for strengthening IP protections using concept of different country measurement varied from domestic innovation intensity and foreign imports. He found that developing countries in complying with the standard ceiling requirements imposed by the TRIPS agreement however confronting with larger variation for uniformly developed strong IP across countries and concluded his paper with the statement;

"*In sum, two directions of policy emerge for developing country government: to exploit more fully and strategically the flexibility inherent in current TRIPS rules, and to analyse the TRIPS rules at a more fundamental level, with view to negotiating for a non-level playing field according to development needs".(Lall:2003, Pp. 1680)*

Therefore the decisions are now left to developing nations to freely decide the appropriate strategy to attract FDI to promote better economic foundation. For these countries, the *joint strategies* for attracting FDI were still remaining in questions.

In this paper we conclude with three potential options;
(1) *Move towards to provide more efficient IP protections,*
(2) *Intensifying technological research and development program;* and
(3) *Working towards combating illegal activity.* For this last option, developing countries were still behind due to insufficiency of intellectual property law enforcements.

The arguments of the abovementioned strategy are based on several reasons. (1) *Short term cost of offering efficient intellectual property protections* (2) *the benefits gained by the nations induced by an intensity of research and development* and (3) *to promote highly efficient market and safeguard to an increase in technological research activity*.

REFERENCES

Alesina. A and B. Weder.1999. Do Corrupt Governments receive less Foreign Aid.
National Bureau of Economic Research Working Paper, No.7108   Cambridge MABayoumi,   Tamim, David T. Coe and Elhanan Helpman. 1999. R&D spillover and global growth. Journal of International Economics 47, 399-428.
Borensztein, E., J. De Gregorio and J-W. Lee. 1998. How does foreign direct investment affect economic growth? Journal of International Economics 45, 115-135.
Coe, David T. and Elhanan Helpman. 1995. International R&D Spillovers. European Economic Review 39, 859-887.
Dean,   Gary.   2000.   The   Role   of   FDI   in   the   Development   of   Singapore.   Available at:www.okusi.net/garydean/works/fdising.html.
Dunning, J.H 1980. Toward an Eclectic paradigm of international production: Some Empirical Test. Journal of International Business Studies, 11, 9-31. Durbin,J and G.S. Watson 1951. Testing for Serial Correlation in Least-Squares Regression. Biometrica 38, 159-171.Eaton, Jonathan and Samuel Kortum. 1996. Trade in Ideas Patenting and productivity in the OECD. Journal of International Economics 40, 251-278.
Economic Freedom of the World: 2002 Annual Report.
Ganguli, Prabuddha. 1998. Intellectual property rights in transition. World Patent Information 20, 171-180.
Gastanga, Victor M., Jeffrey B. and Bistra Pashamova. 1998. Host country reforms and FDI inflows: How much different do they make? World Development 26(7), 1299-1314.
Gelos, R. Gaston and Shang-Jin Wei. 2002. Transparency and International Investor Behavior. National Bureau of Economic Research Working Paper No. W9260. Cambridge MA.
Ginarte, Juan C. and Walter G. Park. 1997. Determinants of patents rights: A cross-national study. Research Policy 26, 283-301.
Gorasia, Paras. 2002. The impact of Article 27 of the TRIPS Agreement on foreign direct investment and transfer of technology to developing countries. Intellectual Property Dissertation April 2002: Available online at:
Gould, David M. and William C. Gruben. 1996. The role of intellectual property rights in economic growth. Journal of Development Economics 48, 323-350.
Gustavson, P., Par Hanson and Lars Lundberg. 1999. Technology, resource endowments and international competitiveness. European Economic Review 43, 1501-1530.
Gwartney, James and Robert Lawson with Neil Emerick. Economic Freedom of the World: 2003 Annual Report. Vancouver: The Fraser Institute, 2003. Data retrieved from www.freetheworld.com
Hines. J.R. 1995. Forbidden Payment: Foreign Bribery and American Business after 1997

National Bureau of Economic Research Working Paper No. 5266. Cambridge MA.

Kwan, Yum K. and Edwin L.-C. Lai. 2003. Intellectual property rights protection and endogenous economic growth. Journal of Economic Dynamics and Control 27, 853-873.

Lall, Sanjaya. 2003. Indicators of the relative importance of IPRs in developing countries. Research Policy 32, 1657-1680.

Liu, Xiaohui and Chenggang Wang. 2003. Does foreign direct investment facilitate technological progress? Evidence from Chinese industries. Research Policy 32, 945-953.

Mankiw, N. Gregory, David Romer and David N. Weil. 1990. A Contribution to the Empirics of Economic Growth. National Bureau of Economic Research Working Paper No.3541. Cambridge MA.

Markusen, James R. 2000. Foreign Direct Investment and Trade. Centre for International Economics Studies. Policy Discussion Paper No. 0019. University of

Markusen, James R. and Anthony J. Venables. 1999. Foreign Direct Direct Investment as a catalyst for industrial development. European Economic Review 43, 335-356.

Maskus, Keith E. and Mohan Penubarti. 1995. How trade related are intellectual property rights?

Maskus, Keith E. and Christine McDaniel. 1999. Impact of the Japanese patent system on productivity growth. Japan and the World Economy 11, 557-574.

McCalman, Phillip. 2001. Reaping what you sow: an empirical analysis of international patent harmonization. Journal of International Economics 55, 161-186.Miller, Stephen.M and Mukthi P. Upadhyay. 1997. The Effect of Trade Orientation and Human Capital on Total Factor Productivity. Department of Economics Working Paper Series Working Paper 1997-07. University of ConnecticutMO. Pak Hung. 2001. Corruption and Economic Growth. Journal of Comparative Economics, 29(1), pp. 66-79.

Paldam. Martin. 2002. The cross-country pattern of corruption: economics, culture and the seesaw dynamics. European Journal of Political Economy 18, 215-240.

Park, Walter G. and Douglass Lippoldt. 2003. The impact of trade-related intellectual property rights on trade and foreign direct investment in developing countries. Organisation for economic co-operation and development.

Park, Walter G. and Smita Wagh. 2002. Chapter 2: Index of Patent Rights, Economic Freedom of The World: 2002 Annual Report.

Park. Walter.G and Ginarte. Juan Carlos. 1997. Intellectual Property Rights and Economic Growth. Contemporary Economic Policy XV, July 1997, 51-61.

Ramsey, J.B. 1969. Tests for Specification Errors in Classical Linear Least Squares Regression Analysis. Journal of the Royal Statistical Society, Series B, 31. pp. 350-371.

Serapio, Manuel G and Donald H. Dalton. 1999. Globalization of industrial R&D: an examination of foreign direct investment in R&D in the United States. Research Policy 28, 303-316

Smarzynska, Beata K. and Shang-Jin Wei. 2000. Corruption and composition of foreign direct investment: Firm level evidence. National Bureau of Economic Research Working paper No. 7969, Cmbridge MA.

Smith, Pamela J.1999. Are weak patents rights a barrier to U.S exports? Journal of International Economics 48, 151-177.

Smith, Pamela J.2001. How do foreign patents rights affect U.S exports, affiliate sale and licenses? Journal of International Economics 55, 411-439.

Solow, Robert M. 1957. Technical Change and the Aggregate Production Function, Review of Economics and Statistics, 39, pp. 312-320.

Takalo, Tuomas and Vesa Kanniainen. 2000. Do patentts slow down technological progress? Real option in reasearch, patenting, and market introduction. International Journal of Industrial Organization 18, 1105-1127.UNESCO Institute for Statistics, available online at http://www.uis.unesco.org/ev.php?URL_ID=4926&URL_DO=DO_TOPIC&URL_SECTION=201

United Nations Conference on Trade and Development (UNCTAD). 2003. World Investment Report 2003 FDI Policies for Development: National and International Perspectives. United Nations, New York and Geneva 2003

United Nations Conference on Trade and Development (UNCTAD). 2003. Investment Policy Review: Botswana. United Nations, New York and Geneva 2003

Varsekalis, Nikos C. 2001. The Impact of patent protection, economy openness and national culture on R&D investment: a cross-country empirical investigation. Research Policy 30, 1059-1068

Wakelin, Katherine. 2001. Productivity growth and R&D expenditure in UK manufacturing firms. Research Policy 30, 1079-1090.

White, H. 1980. A Heteroscedasticity Consistent Covarience Matrix Estimator and a Direct Test of Heteroscedasticity. Econometrica, 48, pp. 817-818.

Wei, Shang-Jin and Yi Wu. 2001. Negative Alchemy? Corruption, Consumption of Capital Flows and Currency Crises. National Bureau of Economic Research, Working Paper W8187. Canbridge MA.

Wei. Shang-Jin. 1997a. How Taxing is Corruption on International Investors. National Bureau of Economic Research, Working Paper W6030. Cambridge MA.Wei. Shang-Jin. 1997b. Why is Corruption so much

more Taxing than Tax? Arbitrariness Kills. National Bureau of Economic Research, Working Paper W6255. Cambridge MA.

Wei. Shang-Jin. 2000. Natural Openess and Good Government. National Bureau of Economic Research Working Paper No.7765, Cambridge MA.

Wint, Alvin G.   and Densil A. William. 2002. Attracting FDI to developing countries: A changing role for government? The International Journal of Public Sector Management 15 (5). 361-374

Wooldridge. J.M.2003. Introductory Econometrics: A Modern Approach. 2ed. South-Western. Thomson Learning. USA.

World Intellectual Property Organization (WIPO). 1996. WIPO Publication No. 223(E). Geneva 1996.

The Globalization ff Financial Markets:
Causes and Consequences to the Financial System

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ABSTRACT

Globalization remains an emotive issue that continues to be debated by government leaders, capitalist, business organization, social activists and religious figures. This research paper will only focus on the financial perspective and its link with the financial system. The first section presented various phases of financial globalization since 1870s. The second section looks at financial globalization from two dimensions; namely the blessed and unblessed trinity and the pre-requisites of financial globalization. The final section comprises of two central themes namely; the catalyst that drives financial globalization and its consequences to the domestic and international financial system. The benefits of financial globalization depend on how well the country's political and financial institutions integrate with the international financial system.

INTRODUCTION

Financial globalization is broadly defined as the integration of countries into international financial markets, which entailed the expansion of financial dealing and trading beyond domestic financial markets. The globalization of financial market is expected to lead to the progressive decline of restrictions on the movement of capital across political boundaries and deregulation of financial markets. Nevertheless, financial globalization is not a new phenomenon as its roots can be traced back to the last quarter of the 20th Century. The evolutionary process of financial globalization can be divided into 4 major phases, each with different features.

Gold Standard (1870s-1913)

This era coincide with the period of colonialism of Western powers led by Great Britain. Cross border capital flows surged, incorporating colonial powers in the center, which was supported by its colonies as periphery in a worldwide network of finance and investment. Raw materials were extracted from periphery countries and shipped back to colonial powers to generate capitalist profits. The capitalist profits from center were reinvested in periphery countries. As such, capital flows from center to periphery without any restriction.[i] This period of unregulated financial globalization from 1870s to 1913, according to Eichengreen and Bordo (2002), was marred by a series of banking crises due to speculation, excessive lending, imprudent banking regulation and supervision, institutional weaknesses, non-transparency and non-disclosure of information. Nevertheless, banking crises tend to be country specific.

Protectionism (1914-1945)

Two World Wars from 1914-1918 and 1939-1945 and the Great Depression from 1929-1932 put an abrupt end to international capital movement due to massive loss in output growth and capital from 1919 to 1939 (Arestis & Basu 2002, p.1).[ii]

Bretton-Woods (1945-1971)

A slow reconstruction of the international financial system and structure took place post 1945. Heavily regulated financial markets, fixed exchange rate and capital control, dominated this period. Banking crisis was eliminated by these series of measures but not currency crisis according to Arestis and Basu (2002). Financial globalization has to take a back seat as the world redress pressing issues like economic growth and employment after two devastating World Wars.

Post Bretton Woods (1973-Present)

The process of liberalizing financial markets around the world gained momentum again after the dismantling of the Bretton-Woods fixed exchange rate regime in 1973, which had created stability in the international financial market, albeit minimum financial integration. However, floating exchange rate creates volatility in the foreign exchange market and interest rate.

The last 25 years of the 20th century saw a new wave of international financial integration with the dismantling of capital controls, deregulation of domestic and financial innovation.[iii] Such a new wave of financial exuberance, which was last seen during the period of 1870s-1913, was supported by technology innovation, rapid dissemination of information and telecommunication.

However, the downside of free movement of capital is the re-emergence of banking crisis on top of the currency crisis. The impact of crisis tends to be on a global scale. Kaminsky and Reinhart (1999) use the term of twin crises to describe this new phenomenon.

GLOBALIZATION PERSPECTIVES

The analysis of financial globalization can be generally viewed from two perspectives; namely beneficiary and requirements of financial globalization.

Firstly, the analysis of financial globalization beneficiary has to take into consideration the relations between the role of money as store value, asset price stability and contractual and regulatory institutions. Torre, Yeyati and Schumukler (2002) study links these above elements with the concept of blessed and unblessed trinity.[iv] Blessed trinity component consists of international currency, flexible exchange rate and sound contractual and regulatory environment, while unblessed trinity is defined as weak currency, fear of floating exchange rate and weak institutional framework. [v] The study concluded that a country's financial system is likely to receive net benefit from financial globalization if it falls under the blessed trinity category. Likewise, premature liberalization of the financial sector tended to result in contagious financial crisis, like in the case of East Asian Currency Crisis 1997-1998 (IMF 2004, p.151-152).

The first element of blessed trinity is international currency. When domestic currency is also a credible reserve currency abroad to store value, the government and residents of a trinity-endowed country can issue debt denominated in domestic currency without having to incur foreign exchange risk. However, in an unblessed trinity environment domestic investors are reluctant to hold domestic denominated assets.[vi] As such, domestic financial institutions have to borrow in foreign currency and incur the risk of maturity and currency mismatch on its balance sheet.

Secondly, flexible exchange rate enables a country to adjust its real exchange rate to solve the problem of excess capacity and unemployment. However, fixed exchange rate distorts the allocation of financial resource through mis-pricing of risk, as shown in the study of McKinnon and Pill (1997). This will serve only to increase the country's vulnerability to speculative attack as Dooley (2000) strongly argued.

Finally, the status of international currency and benefits of flexible exchange rate to the financial system has to be preceded by sound contractual and regulatory institutions. Central bank's policy on asset price stability and prudent regulations has to be seen as credible and independent from political interference, which is unfortunately prevalent in countries that fall under the unblessed trinity category.

The second type of analysis is the prerequisites of financial globalization. Arestis and Basu (2002) argue that for a truly integrated financial system; two main prerequisites have to be achieved. They are alignment of interest rate and a world currency union. The former is unachievable as different countries have different risk premium due to its structural economic dissimilarities. The latter can only be achieved if the wealth gap between rich and poorer countries is narrowed.[vii]

CATALYST OF FINANCIAL GLOBALIZATION

Technology Innovation
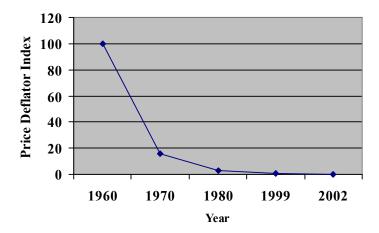
The increasing speed of capital mobility between different financial markets is largely attributed to the technology advancement in the field of electronic telecommunication and communication.[viii] Information can be acquired, processed, analyzed and disseminated rapidly and broadly to facilitate faster trading and decision-

making. As such, cross arbitrage opportunities between different financial markets have increased. Time zones differences and long distance is no longer a crucial barrier for investors, speculators and arbitrageurs in search of the best yield in different financial markets.

Cost is another prerequisite of financial globalization. In the past forty years, technology advancement correlates negatively with cost of procuring the necessary hardware equipment and software program as shown in Figure 1. Cost is a major factor of financial integration of multiple financial markets.

Thirdly, computing speed and cost factor is complemented by mass usage of the masses. The spread of internet technology to the masses has resulted in the proliferation of online stock and foreign currency exchange brokerages, especially in the US, which allows professional traders and the public to trade in stocks and currencies denominated in different foreign currencies and financial markets.

Figure 1: US Computer Price Deflator, 1960 - 1999

Source: US Department of Commerce, 2002

Elimination Of Capital Control

The Bretton-Woods fixed exchange regime views freedom of capital movement beyond national sovereign border, which is not due to foreign direct investment and trade as undesirable and should be discouraged (Yilmaz 1992, p.46). This can be achieved by imposing capital control to curb speculative activities, which is detrimental to the financial stability and long-term economic growth of the country. Table 1 shows the pre and post impact of the East Asian Currency Crisis in 1997-1998 on GDP growth.

Table 1: East Asian Economies GDP (%), 1995-1999

Country	1995	1996	1997	1998	1999
Indonesia	8.22	7.82	4.70	-13.2	0.23
South Korea	8.92	6.75	5.01	-6.69	10.66
Malaysia	9.83	10.00	7.54	-7.50	5.42
Philippines	4.67	5.85	5.19	-0.59	3.32
Thailand	8.90	5.93	-1.68	-10.17	4.16

Source : Asian Development Bank, 2000

The progressive disintegration of the Bretton-Woods fixed exchange rate regime accelerated in the early 70s and culminated with the decision of President Richard Nixon to de-link US dollar from gold in 1973 (Walter & Blake 1992, p.79 & Gilpin 1987, p.140). The US decision spelt the beginning of the end of the capital control era, as more countries moved to float their currencies.

Disincentive To Maintain Capital Control

Firstly, policies that establish barriers between national and global financial markets only serve to push such markets offshore. For example, in the 1990s, traders circumvented Japanese Ministry of Finance attempt to

prohibit the trading of Nikkei index derivatives by establishing an offshore center at Singapore (Garret 2000, p.17). Malaysia has its own share of problem when CLOB market was operational out of the Malaysian securities regulator's jurisdiction until 1998. [ix] Re-regulation at global level is only possible, provided the problem of free rider can be avoided since it only takes one jurisdiction to offer a home to offshore financial markets. Once government discovers the ineffectiveness of capital control, they tend not to retain it.

Secondly, contemporary financial globalization is distinctively different from the pre-1914 world. Then, the high cost of delivery and delays in communication and information and the underdevelopment of financial and derivatives market meant that even the unsophisticated capital control could work. [x]

However, experience in Chile, China, Malaysia and India seem to suggest that capital control could still work in today's volatile financial market. Krugman (1999), Stiglitz (2000), Kaplan and Rodrik (2001) defend the effectiveness of capital control in the event of extreme volatility and financial distress. Though, it work well, all believe capital control should be a temporary measure.

FINANCIAL MARKET DEREGULATION

The theoretical rational of financial deregulation is to eliminate financial pricing distortion, which results in misallocation of resources. This leads to cost efficiency of delivering financial product and pricing. The framework to achieve the above objectives can be argued from two perspectives.

Structural Deregulation

Firstly, once financial deregulation has been effected, there can be no discrimination between foreign and local chartered banks.[xi] Foreign banks are now allowed to venture into domestic loan business, where they were previously prohibited.

Another dimension of structural deregulation can be viewed from the operations integration perspective. Before deregulation, financial institutions are confined to very narrow definition of permissible business operations. In the case of UK's financial deregulation, known as the *financial big bang* in 1986, one of the major features is the ending of business segregation between traditional banking and securities. The relevant laws were amended in 1986 to allow for the purchase of securities/brokerage by banks, *vice versa*. Banks can now engage in traditional retail/commercial banking and securities business at the same time, thus ending the 300 years segregation and separation of banking and securities business in UK financial system. Japan embraced desegregation in 1993 through the Financial System Reform Law and European Union member nations in 1996 (Dale 1996,p.220-221). In the US, the separation of banking and securities business holds by the virtue of the Glass-Stegall Act of 1933 but the separation was finally repealed in 1999 through the Gramm-Leach-Bliley Act (Zaretsky, A 2000,p.1).

Deregulation initiatives led to the attainment of economics of scale and even possible economics of scope through the creation of business synergies. The average fixed cost of delivering financial products would have substantially been reduced as total fixed cost would spread across banking and securities business. Thus, lower cost of doing business and efficiency has provided a considerable impetus to the proliferation of financial conglomerates, which are willing to venture beyond their domestic market of operations.

Financial Instrument Liberalization

Interest rate liberalization is a first step towards promoting efficiency in loan pricing and origination. However, banking industry structure is oligopolistic. As such, the number of players in the banking sector ought to be increased. This can be achieved through the removal of entry restriction for Non Banking Financial Institution (NBFI) and foreign banks.

In Malaysia, NBFI is non-existent despite the fact that it has company like Petronas in the Top 500 Fortune list. With its huge case reserve from oil and gas proceeds, Petronas possess the financial muscle to offer financial services to the capital market. Hence, it is time for Bank Negara Malaysia to promote the role of NBFI through deregulation with the aim of achieving financing deepening and competitive financial product pricing.

Nevertheless, deregulation and capital control account liberalization has to be complemented by a good financial system. A good financial system should consist of the following eight key components: -
- Prudence in public finance and debt management.

- Stable monetary policy.
- An autonomous central bank capable of managing domestic and international finance. Implemented monetary policy should promote robust, sustainable and quality economic growth.
- A well functioning capital markets.
- A competitive financial services industry that comprise of domestic and international chartered financial intermediary.
- Independent and credible judiciary and law enforcement agencies. This will minimize the principal-agent problem that is inherent to financial systems. Contract enforcement, underpinned by transparent shareholder and creditors rights and a trustworthy judiciary shall be able to reduce information asymmetries.
- Sound regulatory environment ensures proper risk management practices. This can be derived through good accounting and information standards of disclosure, risk based capital requirements and prudential supervision of financial services sector in accordance to international accepted standards.
- Competent, corrupt free and credible government in the eyes of international investors.

CONSEQUENCES OF FINANCIAL GLOBALIZATION

Financial Crisis

The 1990s were marked by a series of major financial crisis worlwide.[xii] Although financial crisis is not new, a study conducted by Bordo, Eichengreen, Kiligebiel and Martinez-Peria (2001) concluded that a crisis during contemporary period of financial globalization is more frequent than earlier periods. Eichengreen and Bordo (2002) provide evidence that the probability of a country suffering from a financial crisis doubled post Bretton-Wood 1973. Developing countries seem to bear the brunt of the crisis as opposed to a developed nation. This could be due to the fact that developing nations borrow in developed nation denominated currencies like US dollar, Pound Sterling and Yen. The Asian currency crisis in 1997 was due to the accumulated foreign debt of short-term maturities and the failure of developing countries to hedge against currency exchange risk. By contrast, financial globalization has created an option for developed countries to borrow from international investors in their own domestic currency denominated assets. However, unlike the former, developed nations are not subjected to currency exchange rate risk.

Nevertheless, the impact and duration of financial crisis is less profound than in the past. This could be largely due to prudential regulation, regional co-operation and sound surveillance on the financial system. A good example is the Basle Capital Accord I, which was first introduced in 1988. It established an 8% minimum (weighted) capital adequacy for international banks. Basle Capital Accord II which is scheduled to be implemented starting from 2006 sought to redress the issue of using asset securitization and derivatives instruments to minimize capital charge without modifying the underlying risk. Basle II aims to widen its global coverage due to the globalization of financial markets. Thus, when markets are global so must the regulation as economic and financial stability according to Wyplosz (1999) takes on the character of a global public good. The quest to internalize externalities would require domestic policy and regulation to be realigned to international standards.

Rising financial linkages gives rise to potential contagion effects. Investors, speculators and arbitrageurs' quest for higher returns and portfolio diversification has been supported by the decline in information and transaction costs and access to investment opportunities on a global scale. Nevertheless, while opportunities to make capitalist profit have increased, one should not ignore the emergence of two broad types of contagion, namely fundamental based contagion and pure contagion. The former refers to transmission of financial shocks across national borders due to the weakness of a country's economy. Decision by investors to reassess their investment risk could develop into a domestic financial crisis if the economic fundamentals are weak. The domestic financial crisis can evolve into a regional crisis as bankers start to rebalance its lending portfolio by restricting lending to the affected region.[xiii] This will only accentuate the crisis in emerging markets as large fraction of bank lending is in the form of short-term maturity according to the findings of Van Rijckeghem and Weder (1999). Kaminsky and Reihnart (1999) found out that fundamental based contagion could reach the proportion of an international scale, as demonstrated by the Russian sovereign bond default crisis in 1998. However, one important observation can be made on the financial crisis that transpired during the period of 1997-1998. Although the impact of crisis has taken on a global scale, countries with stronger economic fundamentals were able to withstand the transmission of financial shocks better. [xiv]

Secondly, pure contagion effect is not attributed to structural or fundamentals of the economy. The sharp swing in the international capital flows tends to be speculative and short term in nature. This leads us to the concept of herding, where there is a tendency for investors to follow the crowd, at the expense of fundamental analysis and

information. Fund managers tend to align their portfolio to the performance of the benchmark indices by implementing the strategy of momentum trading. [xv] The advent of technology and communication increases the magnitude of the destabilizing effect on financial markets, which will be transmitted into the economy. Momentum trading thrives on information asymmetries. Information asymmetries is due to risk that cannot be totally eliminated like terrorism, political conflicts, epidemic which cost big economic losses in the case of SARS and non regular events like spikes in oil prices and financial fraud like in the case of BCCI in 1991 and Barings Bank in 1995. Nevertheless, Gelos and Wei (2001) finding shows that the impact is less severe in countries with sound macroeconomic fundamentals and transparent corporate sectors.

Both types of contagion create systemic risk to the financial system. The risk can be categorized into either a sequential or simultaneous pattern. The former consists of a situation where the failure of a financial institution led to another financial institution failure in a sequential manner, while the latter leads to a simultaneous failure of a group of banks, which have potential to destabilize the financial system. In the integrated payment and settlement system, the balance sheet of financial institutions is directly inter-connected to each other because they borrow and deposit funds among themselves. As financial transactions are globalized, risk in foreign exchange settlement arises because the settlement encompasses two legs of foreign exchange transaction that typically takes place in a situation of multiple payment systems, geographical locations and time zones. This interconnection provides an avenue, where financial shocks can be transmitted to every financial institution within the system, in an event of a financial failure. With the globalization of financial markets, financial shocks are no longer confined to domestic market but are extended to international markets. The more financial markets are integrated, the higher is the severity of the impact of systemic risk on the financial system.
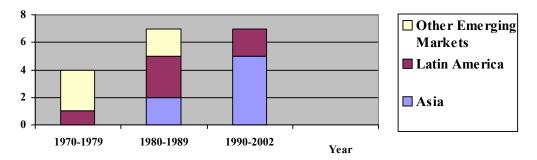
Finally, financial crisis are incompatible with output growth. Bordo et al (2001) are of the opinion that output costs ranged from 6% for individual currency and banking crisis to 19% for crisis having banking and currency components. Normally a currency crisis is preceded by a banking sector problem, like in the East Asian currency crisis. This is a major finding by Kaminsky and Reinhart (1999), whereby the currency crisis serves only to augment the banking crisis, thus, activating a vicious cycle of financial crisis. Banking and currency crisis is closely associated with credit boom, which will be discussed in the following section.

Credit Boom

Banking and currency crisis are often precipitated by credit boom. IMF (2003) survey concludes that about 75% of the credit booms in emerging market economies were associated with banking crisis while as for currency crisis the figure is 85%. The survey underlines three catalysts of credit booms, namely, financing deepening, normal cyclical upturns and excessive cyclical movements or credit boom. The last catalyst creates an excessive and unsustainable credit expansion, which will eventually collapse on its own accord.

Credit booms are synchronized across countries. About 40% of the credit booms were observed in East Asia while 35% in Latin America as shown in Figure 2. Most of the East Asian credit booms took place in the mid 90s, which is a prelude to the Asian Currency Crisis in 1997. As for the Latin America credit boom, most were concentrated during the time of sovereign debt crisis in the early 80s (IMF, 2003 p.151-152).

Figure 2: Emerging Market Credit Booms, 1970 – 2002 (Number of Events)

Source: IMF, International Financial Statistics, 2003

The synchronization of credit booms across countries from 1970-2002 could largely be attributed to the capital inflow and financial liberalization. This can be observed from table 2. More than half of the credit booms were due to capital inflow, while only one sixth were attributed to financial liberalization within the period of 1970-2002.

Table 2: Credit Booms, Capital Inflows, and Financial Liberalization, 1970-2002

	Capital Inflows (%)	Financial Liberalization (%)	Capital Inflows and Financial Liberalization (%)
1970-2002	55.6	16.7	11.1
1970-1979	11.1	5.6	-
1980-1989	16.7	11.1	5.6
1990-2002	27.8	-	5.6

Source : Abiad & Moody (2003)

The mechanism to create credit boom can be explained from the financial accelerator perspective, whereby, shocks to asset prices are amplified through balance sheet effects due to financial market imperfections. The reasons for market imperfections are listed below.

Information asymmetries according to Kindleberger (2000) leads to herding behaviour by banks in terms of extending or withdrawing credit during good and bad times. In a bullish stock market environment, over-optimism about future earnings can boost the asset valuation of the company. [xvi] As a result, company can increase its corporate leverage by using its shares as collateral. However, this is not a sustainable practice as in the event of a financial meltdown asset prices and collateral value will decline. This can set off a vicious cycle when banks start to withdraw credit facility. [xvii]

Institutional weakness refers to imprudent macroeconomic policy and poor regulatory supervision standard, which creates moral hazard to the financial system. Failure to cool an over-heating economy in East Asia, which was supported through over-valued artificial exchange rate and capital inflow is a prime reason that leads to the Asian currency crisis from 1997 to 1998. As most central banks are not autonomous in most East Asian countries it is difficult to make monetary decisions that will make the government unpopular.

Adverse incentives and adverse selection are created, according to Corsetti, Pasenti and Roubini (1999) study, in an environment of explicit or implicit government guarantees. This will only exacerbate the principal-agency problem. In Malaysia, the government through the Bank Negara Malaysia gives explicit guarantee on deposit held by customers in financial institutions. For the customer, it is a risk free investment. Unfortunately, this blanket policy of bank deposit guarantees creates adverse incentives for banks to lend to risky borrowers for higher rates of return, knowing that they can always count on the government to bail them out with tax- payers money if it faces insolvency [xviii]

MONETARY AND FISCAL POLICY AUTONOMY

The Asian Currency crisis in 1997 was a stark reminder of the loss of autonomy when it comes to economic management of a country. [xix] Before the imposition of capital control in 1998 by the Malaysian government, there was Euro-Ringgit currency deposit offered by British banks in London. [xx] Prior to 1997 crisis, the interest rate on Euro-Ringgit deposit in London was in the region of 7%. Between 1997-1998, short-term currency speculation led to spikes in interest rate on Euro-Ringgit deposit. Suddenly, British banks were willing to pay as high as 30% on Ringgit deposit due to demand for the Malaysian Ringgit by currency speculators (Singapore Business Times 1st October 2001, p.5). When that happened, Bank Negara Malaysia was forced to raise interest rate on domestic deposits to prevent capital outflow from Malaysia. This proved to be ineffective and counter-productive to stem outflow of Malaysian Ringgit, as it only led to tit for tat interest rate hikes between off-shore banks and domestic banks. Currency speculators might see this as a matter of placing bets, risks and portfolio allocation but the impact on the Malaysian economy is debilitating to macroeconomic health and stability of the country in the long run.

Exchange rate has a direct implication on the level of autonomy enjoyed by the central bank on monetary policy. Floating exchange rate confers more autonomy to central bank on monetary issues as opposed to fixed exchange rate. The former allows central bank to align its monetary policy with domestic economic environment to pursue price stability. Thus, the flexibility of floating a currency allows the central bank to smooth out cyclical output and employment fluctuations to the extent that monetary policy has transitory real effects.[xxi] In the case of the

latter, the success of a fixed exchange rate regime requires the central bank to hold large reserves of international currency to lend credibility to the peg. Hence, the country's monetary policy is anchored to the monetary policy of a credible reserve currency. In the case of Hong Kong currency board system, there is limited monetary autonomy, as the decision making of the Hong Kong Monetary Authority is largely dictated by the US Federal Reserve. As such, in terms of retaining autonomy on monetary policy in a period of financial globalization, it is better to float the currency rather than maintain a fixed exchange rate regime.

As for fiscal policy, the globalization impact has been mixed at best. Empirical Studies by Garret (1998&2000), Kitschelt, Lange, Marks and Stephens (1999) found no evidence of clear direction towards less government fiscal intervention. Based on World Bank data on low and middle- income developing countries in Figure 3, there is a general increasing trend of government expenditure from early 1960s to 1980s before falling in the mid 1980s. Expenditure ratio to GDP increased again from mid 80s before it started to fall again in the early 1990s. Could financial globalization imposed constraint on government expenditure in the last two periods? However, Figure 4 seems to present an opposite trend. Since 1972, government debt is on an upward trend from a low of about 22% of GDP to a high of 70% of GDP.

Figure 3 : Low and Middle Income Developing Countries Government Expenditure, 1960-2000

Source: World Bank, World Development Indicators, 2001
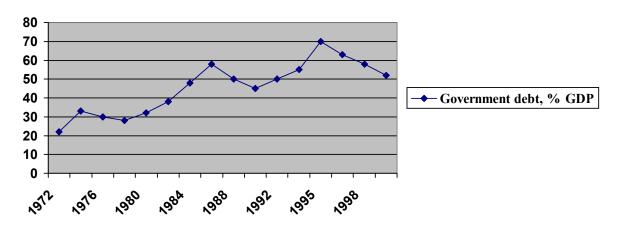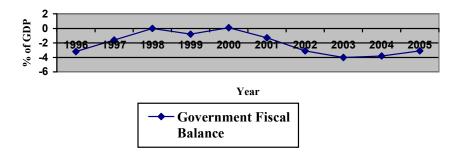
Figure 4 : Low and Middle Income Developing Countries Government Debt, 1972-2000

Source : World Bank, World Development Indicators, 2001
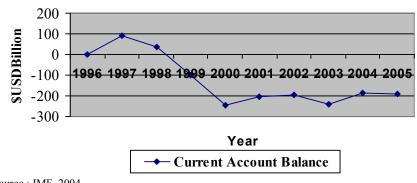
Figure 5 and 6 suggest that financial globalization does not seem to be able to impose fiscal discipline on advanced economies. The current account and fiscal balance have been deteriorating since 1996. The fiscal performance between advanced and emerging economies is illustrated in Figure 6 and 7. Since 1999, the increase in deficit of current account balance in advanced economies correlates with the increase in surplus in developing countries. While financial integration is supposed to promote prudent management of the economy, there seems to be two set of rules for advanced and emerging and developing countries. If developing and emerging markets were to record the performance showed in Figure 6 and 7, they would have been severely punished by the financial markets. This inconsistency could be due to the fact that advanced economies have all the three blessed trinities, whereby developing countries were impoverished by the three unblessed trinities.

Figure 5: Advanced Economies Fiscal Balance, 1996 - 2005
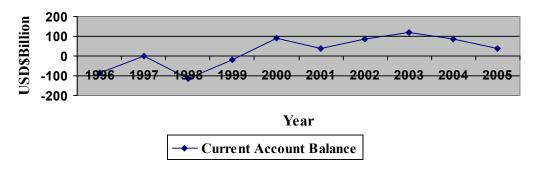
Source : IMF, 2004

Figure 6: Advanced Economies Current Account Balance, 1996 - 2005

Source : IMF, 2004

Figure 7: Current Account Balance, Emerging Markets and Developing Countries, 1996 – 2005

Source : IMF, 2004

DEVELOPMENT OF DOMESTIC FINANCIAL MARKET

The participation of foreign banks stimulates the growth of the domestic financial market. Firstly, foreign banks provide access to international financial markets due to its vast networking, reputation and experience. This

allows domestic financial institutions to diversify their operational, market and credit risk. For example, balance sheet risk held by domestic financial institutions can be lowered through syndication of a portion of corporate loan and underwriting business to foreign financial institutions. Secondly, liquidity of the domestic financial market is enhanced due to foreign capital inflows. This lowers risk premium borrowing rate for domestic banks, government and private sector. Thirdly, foreign financial institutions bring with them best management practices and regulatory and supervision framework into the domestic banking industry.[xxii] Finally, financial deepening is achieved in the domestic financial market through the introduction of financial and technology innovation by foreign banks. As such, studies by Levine (1996) and Caprio & Honohan (1999) show the entry of foreign banks tend to increase the level of competitiveness and quality of domestic financial services. These identified factors are categorized under pull factors.

CONCLUSION

The process of financial globalization is progressing at a breathtaking pace since 1990. There has been a massive increase in foreign exchange and portfolio capital flows in recent years. For the example, the triennial Bank for International Settlements (BIS) survey
showed that in April 2001, average daily turnover in spot foreign exchange markets
was $1.2 trillion, and average turnover in derivative markets was $1.4 trillion (BIS 2001,p1&9).

However, this research paper concludes that benefits due to financial globalization are disproportionately enjoyed by developed nations. This is because developed nations possess the three blessed trinity, which enable them to integrate well into the international financial system. Unfortunately, majority of the developing nations' financial system falls under the unblessed trinity. Hence, premature liberalization of their financial markets results in developing nations having to bear the pitfalls of financial globalization in the long run. Hence, it creates a widening wealth gap between rich and developing nation. If steps are not taken to redress this imbalance and unfairness in the trading of financial services, the process of financial globalization will only lead to even more uneven distribution of wealth between developed and developing nations. As history has demonstrated succinctly, economic deprivation could exacerbate social divide and political discontentment, which in turn could be transformed into a source of political instability to the world.

Endnotes: -

[i] Hirst and Thompson (1996) estimate that Britain was exporting an annual net savings of up to 9% of its GDP pre-1914.
[ii] Great Depression 1929-1932 was precipitated by US stock market collapse in the late 1920s.
[iii] The United States of America, Canada, Germany and Switzerland removed restrictions on capital movement in 1973, UK in 1979, Japan in 1980 and France & Italy in 1990 (Nayyar 1997, p.20).
[iv] Torre, Yeyati and Schmukler (2002) use the example of dollar trinity and peso trinity to further illustrate the impact of financial globalization on the financial system.
[v] The concept of impossible trinity is pioneered by Mundell in the 60s. According to this principle, a country can only achieve at best 2 of the 3 elements; namely flexible exchange rate, capital account liberalization and autonomous monetary policy.
[vi] Financial dollarization is a term used to describe this situation.
[vii] So far only the United States (dollar) and European Union (Euro) has managed to achieve success in monetary union.
[viii] For every 18 months, the processing speed and computing power of microprocessor doubles by Moore's Law. Rapid improvement in communication technology has increased from a speed of 300 BPS in the form of twisted wire to 10 GBPS in the form of fibre optics (Laudon 2000, p.128 & 267).
[ix] CLOB was established in Singapore to trade in Malaysian listed shares. It was finally abolished following the imposition of the capital control by the Malaysian government in 1998.
[x] [x] Broz (1997) presented evidence in the successful implementation of capital control in countries like France and Germany before 1914.
[xi] Banks are granted a trading charter by the supervisory authority where they were first incorporated
[xii] Among them are the ERM 1992 crisis, Mexican Peso 1994 crisis, Asian currency crisis 1997-1998, Brazilian Real crisis 1998, Russian sovereign debt crisis 1998 and Argentina 2002-2003 crisis.
[xiii] Credit crunch developed as banks and investors cut down their exposure to SEA region at the height of the Asian Currency Crisis in 1997-1998.
[xiv] During the Asian currency crisis HK dollar peg to the US dollar withstood the pressure of speculator and hedge fund. Impact on Singapore's economy was minimal. In fact, it was a beneficiary from fund outflow from neighbouring countries like Malaysia and Indonesia. US financial markets reacted adversely to the crisis in Russia in 1998 but soon rebounded convincingly.
[xv] Momentum trading is defined as a strategy to rapidly buy assets as they appreciate and sell down assets as they decline through a series of short selling activities (IMF 2003, p.48).
[xvi] Borrowers have an incentive to exaggerate its potential earnings to secure more credit if banks are not well versed with its business operations.
[xvii] Recent events are the Asian Currency Crisis 1997, US technology bust in 1999, Enron and World Communication financial scandals.

[xviii] This type of decision-making is called adverse selection. Bank Bumiputera has be to bail out three times by the Malaysian government through Petronas before being finally merged with Bank of Commerce during a banking consolidation exercise in 2001. MBF was taken over the same year by Bank Negara Malaysia.

[xix] For countries that were under the bailout program of the IMF, the loss of autonomy on monetary and fiscal policy was absolute

[xx] EuroRinggit was Malaysian Ringgit currency offered offshore. Hence, these off shores deposits from the perspective of domestic financial regulator and Bank Negara Malaysia are beyond their control and influence

[xxi] This must be supported by a sound contractual and regulatory institution as part of the blessed trinity theory in the study of Torre, Yeyati and Schmukler (2002).

[xxii] Evidence presented by Borensztein, De Gregorio and Lee (1998).

The Determinant of Foreign Direct Investment:
Some Empirical Evidence of ASEAN Countries

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ABSTRACT

The study investigates the determination of foreign direct investment (FDI) in ASEAN countries, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. For ASEAN countries as a group, the results show that the market size is found to have a significant positive impact on FDI. The formation of ASEAN free trade area (AFTA) and Asian financial crisis, 1997-1998 are not found to have a significant impact on FDI. For each of ASEAN countries, the result shows about the same conclusion as the result for ASEAN countries as a group, but various across countries. Market seeking FDI is an important type of FDI in ASEAN countries. Moreover, there is no simple generalisation of the determination of FDI, which implies the determination of FDI to be justified on a case-by-case basis.

INTRODUCTION

There are many definitions for foreign direct investment (FDI). Generally, FDI is defined as the long-run investment made by a non-resident entity, as an individual or an organisation in a non-resident economy where the non-resident entity has some sense of controlling over the investment. United Nations Conference on Trade and Development (UNCTAD) defines FDI as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy in an enterprise resident in an economy other than that of the resident entity. FDI implies that the investor exerts a significant degree of influence on the management of the enterprise resident in the other economy. FDI involves both the initial transaction between the two entities and all subsequent transactions between them and among foreign affiliates. On the other hand, International Monetary Fund (IMF) emphasises on the ownership of the non-resident entity over the investment 10 percent or more of equity of an entity as FDI. This guideline aims to dividing between FDI and portfolio investment in the form of shareholdings. FDI has three components, namely equity capital, reinvested earnings and intra-company loans. FDI can be wholly owned through acquisitions, greenfield or joint ventures (Chadee and Rose, 2003).

In the recent years, it is generally agreed that FDI could contribute to economic growth and development of the recipient economy. For developing countries (DCs) in particular, FDI is an important source of capital, technology, management know-how and productivity. Moreover, FDI contributes to industrial development, various employment opportunities and trade volume (UNCTAD, 1993: 12). FDI is also more stable in comparison with other forms of foreign capital, with a longer-term commitment to the recipient economy. Asian financial crisis, 1997-1998 shows that other forms of foreign capital, such as portfolio investment and loan reduced significantly during the crisis in most of affected countries while FDI remained positively (Dutt, 1998: 48-51). FDI is motivated by the long-term prospects of the investors for making profits in production activities that they directly control. On the other hand, foreign portfolio investment and loan are usually motivated by short-term profit considerations. FDI is the largest source of external finance for DCs. The stock of FDI of DCs amounted to about one third of their gross domestic product (GDP), compared to just 10 per cent in 1980 (http://www.unctad.org).

FDI is an important source of technology transfer. Technology is crucial for DCs and is shown in the endogenous growth models that technology contributes to economic development (Romer, 2001). In the endogenous growth models, technology could be transferred to DCs through the imitation and importation of high-technology goods and inputs, the mobility of human capital internationally and FDI. The nature of multinational corporations (MNCs) in dissemination of technology has been discussed in several studies. MNCs generally have advantages of more advanced technology, which may be disseminated in the recipient economy through, for example the adoption of the advanced technology by competing firms, the training of workers and the development of infrastructure (Nyatepe-Coo, 1998: 88; Markusen and Venables, 1999).

FDI may increase the productive capacity of an economy in many ways. Foreign firms in general are more productive, which stimulates competition in the domestic market, at least in highly concentrated industries. Therefore, productivity of the economy is expected to be raised (Lim, 2001: 3). FDI may also increase the

productive capacity of the economy through human capital formation or the development of activities based on natural resources. The latter is called backward linkages of FDI (UNCTAD, 2001). FDI has been and will remain a major force in regional industrial restructuring (Chi-Hung, 1996: 157). FDI seems to increase industrial output, generating employment and adding tax revenue (Zhang, 2001: 682).

Nevertheless, the presence of FDI in the recipient economy may not leave without any negative impact on the recipient economy. FDI may cause deficit in the balance of payments of the recipient economy if FDI rises to substantial reverse flows in the form of remittances of profits and dividends and or if MNCs obtain substantial tax or other concessions from the recipient economy (Phang, 1998; Ramirez, 2000: 145). FDI may suppress domestic firms and use their advantages in technology to drive out domestic competitors (Zhang, 2001: 684). Moreover, the role of FDI as a source of technology transfer is queried in some studies, which argue the less importance of technological progress in contributing to economic growth. For example, Kim and Lau (1994) found that technological progress was relatively unimportant as a source of growth of the four East Asian newly industrialising economies (NIEs). The most important source of economic growth of the East Asian NIEs was capital accumulation, accounting for 48-72 percent of their economic growth, in contrast to France, West Germany, Japan, the United Kingdom and the United States, where technical progress has played the most important role, accounting for 46-71 percent of their economic growth.

FDI is one of important factors that leads to the globalisation of the world economy. FDI contributes to strong economic links between countries (Chung-Sok and Jung-Soo, 1998: 124). Generally, FDI in the world increases over time. In 1970, FDI in the world was US dollar 12,586 million, increased to US dollar 54,945 million in 1980 and US dollar 202,782 million in 1990. In 2001, FDI in the world was US dollar 735,146 million. Developed countries remain the main destination of FDI while DCs still receive a small amount of FDI (UNCTAD, 2002). Nonetheless, the geography of FDI has been changing. Although, developed countries such as those of Western Europe and North America have been remaining the main destination of FDI, but DCs such as those of South, East, and Southeast Asia, have increasingly been the recipients of FDI. China has been a major recipient economy for FDI. Currently, China is the second largest recipient of FDI in the world, and the largest recipient among DCs (Chadee and Rose, 2003). For ASEAN countries, Singapore, Malaysia and Thailand have been receiving quit substantial amounts of FDI in the region (Chung-Sok and Jung-Soo, 1998: 125).

Generally, the determination of FDI in DCs is not well understood. Pan (2003) examined the determination of FDI in China and reported that some of the factors generally viewed, as important determinants for FDI in developed countries are not important in China. Thus, this raises the question regarding the generalisation of the determination of FDI (Chadee and Rose, 2003). Moreover, identifying a set of determinants for FDI is important for policy markers in the competitive world of attracting FDI. Thus, the main aims of the study are to investigate the determination of FDI in ASEAN countries as a group and also the determination of FDI in each of ASEAN countries. For ASEAN countries as a group, the estimations are carried-out by using the panel estimator while for each country of ASEAN countries the estimations are carried-out by using the ordinary least squares (OLS) estimator. The period of study is generally from 1972 to 2002.

The rest of the article is organised as follows: Section 2 gives an explanation of ASEAN and FDI in ASEAN countries. Section 3 provides a literature review of the determination of FDI. Section 4 explains the empirical estimations and data. Section 5 discusses the empirical results. Section 6 gives some concluding remarks.

ASEAN AND FDI

ASEAN was established on 8 August 1967 in Bangkok. Its five founder members are Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Brunei Darussalam joined on 8 January 1984, Viet Nam on 28 July 1995, Laos and Myanmar on 23 July 1997, and Cambodia on 30 April 1999. The initial objectives of ASEAN were to foster regional security and intra-regional dispute resolution issues (http://www.aseansec.org/). ASEAN, a total area of 4,495,493 million square kilometres, has a combined population of about 500 million and a combined GDP of US dollar 737.48 million in 2000. The average GDP per capital of ASEAN was US dollar 1,474, varying from US dollar 315 in Lao to US dollar 25,864 in Singapore. In 2000, real GDP grow rates in ASEAN were impressive, ranges from 3 percent in Brunei Darussalam to 9.9 per cent in Singapore. Growth rate of consumer price indices were rather stable in most of ASEAN countries. Unemployment rates in ASEAN vary across countries, from 3.1 percent in Singapore and Malaysia, respectively to 7.4 percent in Viet Nam (UNCTAD).

In the 1970s, economic goals became an important agenda for ASEAN. In 1972, a United Nations team of experts recommended that ASEAN countries take a number of measures, which would accelerate their industrial development on a regional scale through closer regional economic integration. The rational is that a larger ASEAN market, in the form of an ASEAN free trade area would encourage industrial development and intra-

regional trade. In 1977, a preferential trading agreement (PTA) is signed to reduce tariffs on goods meeting rules of origin requirements with the aim to encourage closer regional co-operation through an expansion of intra-regional trade (Tan, 1996: 139-140). The PTA was not very successful, amongst others, because its narrow commodity coverage and the half-hearted nature of the implemented process. The industrial cooperation schemes are also not very successful, amongst others, the precedence of national over regional interests and lack of initiative and participate from private sector (Yamazawa, 1992: 1525; Athukorala and Menon, 1996; Tan, 1996: 140-155).

In January 1992, it was agreed to reactive integration of ASEAN by establishing an ASEAN free trade area (AFTA) within 15 years. The idea was partly in response to the slow progress of effective trade liberalisation under the PTA and the formation of North American Free Trade Agreement (NAFTA) and the unification of the European Union market. Also, there was alert the possibility of the diversion of FDI away from Southeast Asia towards North America and Western Europe (Tan, 1996: 159-160). Under AFTA, all ASEAN countries participate in a Common Effective Preferential Tariff (CEPT) scheme. Under the CEPT scheme, the countries of ASEAN would reduce intra-regional tariffs on all manufactured items including capital goods and processed agricultural products and remove non-tariff barriers over a 15-year period commencing 1 January 1993. However, in view of the economic challenges, the ASEAN Economic Ministers meeting on 22-23 September 1994 in Chiangmai, Thailand agreed to shorten the time frame for the realisation of the AFTA from 15 to 10 years, finishing by 1 January 2003 instead of 2008, and to include unprocessed agricultural products (UAPs) into the CEPT scheme (Tan, 1996: 160).

ASEAN, as a group, receives a relatively small amount of FDI in the world. In 1970, ASEAN received 3 percent of FDI in the world, increased to 4.4 percent in 1980 and 6.3 percent in 1990. After Asian financial crisis, ASEAN received a much smaller amount of FDI in the world, 1.8 percent in 1999 and 2001, respectively. Nevertheless, ASEAN, as a group, receives a substantial amount of FDI among DCs. In 1970, ASEAN received 12 percent of FDI in DCs, increased to 28.8 percent in 1980 and 33.9 percent in 1990. In 2001, ASEAN received 6.5 percent of FDI in DCs. Generally, FDI in ASEAN had been increasing prior to Asian financial crisis and has been declining after the crisis. In 1970, FDI in ASEAN was US dollar 374 million, increased to US dollar 2,415 million in 1980 and US dollar 12,740 million in 1990. In 1995, FDI in ASEAN was about twice the amount of FDI in 1990, i.e. US dollar 25,367 million. After the crisis, FDI in ASEAN has been declining. In 1999, FDI in ASEAN was US dollar 19,691 million and decreased to US dollar 13,240 million in 2001 (Table 1).

Table 1: FDI: A Comparison (US Dollar, Million)

	1970	1980	1990	1995	1996	1997	1998	1999	2001
World	12,586	54,945	202,782	330,516	386,140	478,082	694,457	1,088,263	735,146
ASEAN	374	2,415	12,740	25,367	29,370	30,370	18,505	19,691	13,240
(%)[@]	(3.0)	(4.4)	(6.3)	(7.7)	(7.6)	(6.4)	(2.7)	(1.8)	(1.8)
DCs	3,109	8,380	37,567	112,537	152,685	191,022	187,611	225,140	204,801
ASEAN	374	2,415	12,740	25,367	29,370	30,370	18,505	19,691	13,240
(%)[@@]	(12.0)	(28.8)	(33.9)	(22.5)	(19.2)	(15.9)	(9.9)	(8.7)	(6.5)

Source: UNCTAD.
Notes: FDI is in the balance of payment basis. DCs denote developing countries. [@] Denotes percentage of the world's FDI. [@@] Denotes percentage of DCs' FDI.

FDI in ASEAN is concentrated in few countries and the rest receive a small amount of FDI. Singapore, Thailand and Malaysia receive most of FDI in ASEAN. On the other hand, the Philippine receives fairly amounts of FDI. Indonesia receives a large amount of FDI prior to the crisis. After the crisis, Indonesia experiences FDI outflows more than FDI inflows (Table 2). The unequally distributed of FDI in ASEAN is partly because of policy towards FDI and also infrastructure facilities. Generally, countries receive less FDI are those late in adopting a more liberal policy towards FDI, lack of basic infrastructure facilities and political instability. Moreover, these countries are lack of semi-skilled and skilled labour.

Table 2: FDI: ASEAN Countries (US Dollar, Million)

	IND	MAL	PHI	SIN	THA
1970	83	94	-25	93	43
1980	180	934	-10	1,236	189
1990	1,092	2,611	550	5,575	2,562
1991	1,482	4,043	556	4,887	2,030
1992	1,777	5,138	776	2,204	2,114
1993	2,003	5,741	1,238	4,686	1,805
1994	2,108	4,581	1,591	8,550	1,364
1995	4,346	5,816	1,459	8,788	2,068
1996	6,194	7,296	1,520	8,608	2,271
1997	4,677	6,324	1,249	10,746	3,626
1998	-356	2,714	1,752	6,389	5,143
1999	-2,745	3,895	578	11,803	3,561
2000	-4,550	3,788	1,241	5,407	2,813
2001	-3,277	554	1,792	8,609	3,759

Source: UNCTAD.
Notes: FDI is in the balance of payment basis. IND denotes Indonesia. MAL denotes Malaysia. PHI denotes the Philippines. SIN denotes Singapore. THA denotes Thailand.

THE DETERMINATION OF FDI

Shatz and Venables (2000) classify FDI into two main categories, namely vertical FDI and horizontal FDI. Vertical FDI occurs when MNCs fragment the production process internationally, locating each stage of production in a country. The main motive is to minimise the costs of production, which could be labour of different skill levels, primary commodities, intermediate goods, or even access to externalities, such as knowledge spillovers. Vertical FDI is usually trade creating, since products at different stages of production are shipped among different locations. Horizontal FDI occurs when MNCs operate the same production activities in multiple countries. The motive could be to reduce costs, such as transportation costs and tariffs or to improve the competitive position of firm in the market. This type of FDI is mainly to serve local markets and therefore substitutes for trade, since parent firms replace exports with local production. The distinction between vertical FDI and horizontal FDI is not clear when one plant may serve both functions (Shatz and Venables, 2000). Moreover, the motives for foreign production may change over time (Dunning, 1993: 57). The boundaries between different types of FDI become not clear as all FDI is seen as part of an overall strategy of enhancing competitiveness. This strategy therefore makes it increasingly difficult to point to a single locational determinant (Noorbakhsh *et al.*, 2001: 1595).

The literature of the determination of FDI proposes few important factors that affect FDI, such as the market size, openness to international trade, economic integration and costs of production. Some of the factors are likely to affect all types of FDI. Nevertheless, the different strategic objectives implicit in vertical FDI and horizontal FDI suggest that some of factors may affect one type of FDI more than the other (Lim, 2001: 12). Generally, the larger the market size of the host country, the more attractive it is to FDI. A large market size is conducive to increase in demand for the products and services. Moreover, a large market size allows the achievement of economies of scale (Caves, 1971; Erdal and Tatoglu, 2002). A large market size will encourage horizontal FDI. Nevertheless, vertical FDI is indifferent to the market size of the host country. The net impact of market size on FDI is likely to be positive. Therefore, the relationship between FDI and the larger the market size is expected to be positive (Lim, 2001). The proxy for the market size in the literature of the determination of FDI is usually the real GDP, the real GDP per capita or population. Most of studies in the literature suggest that the market size is found mostly to have a significant positive impact on FDI (Chung-Sok and Jung-Soo, 1998; Billington, 1999; Cheng and Kwan, 2000; Shatz and Venables, 2000). This partly reflects the fact that most of the world's FDI is horizontal in nature (Lim, 2001).

Countries, which adopt an export promotion policy usually, reveal a high degree of openness. Thus, openness to international trade is used to capture that factor (Chung-Sok and Jung-Soo, 1998: 134). A free trade area is a form of EI. In a free trade area, member countries remove tariffs among themselves and each of member countries determines its own tariff towards non-member countries (Rodgers, 1998: 213; Appleyard and Field, 2001: 351-362). Economic integration creates a larger market (Motta and Norman, 1996: 758). Thus, economic integration is a way to attract FDI for local production within the integrating area. A larger market allows firm to increase its production to achieve economic of scale, which increases productivity and reduces costs of production. A larger market can accommodate more firms. Thus, a firm may face higher competition, which would encourage efficiency. Alternatively, firm may seek strategic alliances or merge with another firm to meet a more competitive environment after trade barriers are removed.

The lower the costs of production, the more attractive it is to FDI. Therefore, the higher the wage costs is likely to defer FDI and the relationship between FDI and the wage costs is expected to be negative. Nevertheless, empirical findings about the significance of the relationship is mixed (Billington, 1999; Lim, 2001). Cheng and Kwan (2000) found the real wage costs has a significant negative impact on FDI in China. Interest rate is a measure of the cost of capital. A higher interest rate implies more costly for investment and therefore, the higher the interest rate is likely to defer FDI and the relationship between FDI and the interest rate is expected to be negative. Love and Lage-Hidalgo (2000) and Erdal and Tatoglu (2002), amongst others found that an increase in the interest rate leads to a decrease in FDI.

The literature suggests that in addition to the variables selected above, there are other factors, which could have an important impact on FDI such as incentives (fiscal and monetary), special economic zone (such as free trade or exports processing zone), business or investment climate, economic distance or transportation cost and political stability (Noorbakhsh *et al.*, 2001). Nevertheless, those factors are empirically difficult to be investigated.

Chung-Sok and Jung-Soo (1988) examined the determination of FDI in four Asian NIEs, ASEAN-4 and China. The study uses a cross-country model for heteroscedasticity consistent OLS estimation and uses the averages of variables for each country over the period 1985-1994. Moreover, the study pools the time series and cross-section data over the period 1987-1994 and employs the OLS estimator. The results amongst others show that openness to international trade is found to be the most important factor for the determination of FDI, which reveals the dynamic nature of the economies created by the export promotion policy adopted by the government. The GDP growth rate is shown to have a negative impact on FDI. Nonetheless, population as a proxy for the market size is found to have a significant positive impact on FDI. The growth rate of wage and the membership in ASEAN are found not to have a significant impact on FDI. On the whole, they concluded that the market size and openness to international trade are more important determinants for FDI than the low wage rate.

Nunnenkamp and Spatz (2002) examined a sample of 28 developing countries over the period 1987-2000. The results show that amongst others there is a significant Spearman correlation between FDI and per capita gross national product (GNP). On the other hand, population and GNP growth are found to be statistically insignificant. However, when regressions were performed separately for the non-traditional factors, in which traditional factors were controls, namely population and per capita GNP, only factor costs produced significant results and, even so, only for the period of 1997-2000.

Carstensen and Toubal (2004) examined the determination of FDI in Central and Eastern European countries. The results show that the traditional determinants such as market potential, low relative unit labour costs, a skilled workforce and relative endowments are found to have a significant impact on FDI. In addition, transitions-specific factors such as the level and method of privatisation and the country risk play important roles in the determination of FDI and help to explain the differing attractiveness of the individual countries to foreign investors.

THE EMPIRICAL ESTIMATION AND DATA

Generally, the determination of FDI is said to be a function of the market size, openness to international trade, the interest rate and the government consumption. In this study, the model to be estimated is specified as:[1]

$$\Delta \, FDI_{it} = \beta_{10} + \beta_{11} \, \Delta \, Y_{it} + \beta_{12} \, \Delta \, O_{it} + \beta_{13} \, \Delta \, R_{it} + \beta_{14} \, DI_{it} + \beta_{15} \, DC_{it} + \beta_{16} \, \Delta \, G_{it} + e_{1,it} \tag{1}$$

where Δ is the first difference operator; FDI_{it} is FDI; Y_{it} is the market size; O_{it} is openness to international trade; R_{it} is the interest rate; DI_{it} is the dummy variable for the formation of AFTA (0 for 1972-1991 and 1 for 1992-2002); DC_{it} is the dummy variable for Asian financial crisis, 1997-1998 (1 for 1997-1998 and 0 for the rest); G_{it} is the government consumption; and $e_{j,it}$ (j = 1, 2) is an error term. For each of ASEAN countries, equation (1) is also estimated, but without the subscript i.

An increase in the market size, openness to international trade or the government consumption would lead to an increase in FDI. Therefore, coefficients of those variables are respectively expected to have a positive sign. On the other hand, an increase in the interest rate would lead to an increase or a decrease in FDI. Thus, the expected sign for the coefficient of the interest rate is to be determined by the data. The coefficient of the dummy variable for the formation of AFTA is expected to have a positive sign while the coefficient of the dummy variable for Asian financial crisis is expected to have a negative sign.

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[1]The results of the Phillips and Perron (1988) unit root test statistic which are not reported show that generally all the variables are stationary in the first differences.

The study uses panel data. The empirical estimation is carried out by using the random/fixed-effects estimator. The result of random/fixed-effects estimator to be used is determined by the Breusch and Pagan Lagrangian multiplier (LM) test statistic. For the insignificance of the LM test statistic, the result of the random-effects estimator is used. Otherwise, the result of the fixed-effects estimator is used. Nevertheless, only one of the results is to be reported.[2] For each of ASEAN countries, the empirical estimations are carried out by using the OLS estimator.

The sample period is generally from 1972 to 2002. The sample period is chosen subject to the availability of data. The data were obtained from IMF. FDI (FDI_{it}) is expressed as a net basis (capital account credits less debits between direct investors and their foreign affiliates) in a particular year divided by consumer price index (1995=100). The market size (Y_{it}) is expressed as the gross national income divided by GDP deflator (1995=100). Openness to international trade (O_{it}) is expressed as (Exports + Imports) / Nominal GDP. The interest rate (R_{it}) is expressed as the deposit rate divided by consumer price index (1995=100) for Indonesia and Thailand, and as the treasure bill rate divided by consumer price index (1995=100) for Malaysia, the Philippines and Singapore. The government consumption (G_{it}) is expressed by the government consumption divided by consumer price index (1995=100). All the currency values are in US dollar.

EMPIRICAL RESULTS AND DISCUSSIONS

The result of the determination of FDI in ASEAN countries as a group is reported in Table 3. The market size is found to have a significant positive impact on FDI. Other independent variables are found to be statistically insignificant. The results of the determination of FDI in each of ASEAN countries are reported in Table 4. For Indonesia, the market size is found to have a significant positive impact on FDI. On the other hand, Asian financial crisis is found to have a significant negative impact on FDI. Other independent variables are found to be statistically insignificant. For Malaysia and Singapore, the market size is found to have a significant positive impact on FDI. The rest of independent variables are found to be statistically insignificant. For the Philippines, all independent variables are found not have a significant impact on FDI. This may suggest that other factors that affect FDI to be considered. For Thailand, the formation of AFTA is found to have a significant negative impact on FDI. On the other hand, Asian financial crisis is found to have a significant positive impact on FDI.

Table 3: The Result of the Determination of FDI in ASEAN Countries

Model	1
constant	-.5444767
	(-0.29)
ΔY_{it}	.0004355
	(2.91)**
ΔO_{it}	17.27031
	(1.79)
ΔR_{it}	.6089276
	(0.02)
DI_{it}	-3.08814
	(-1.09)
DC_{it}	4.298912
	(0.68)
ΔG_{it}	-.1021052
	(-0.80)
R^2	0.1112
LM	1.97

Notes: R^2 is the overall goodness of fit. LM is the Breusch and Pagan Lagrangian multiplier test statistic for random effects. T is the number of observations used in the estimation. Values in parentheses are the t-statistic for the random-effects estimator. ** Denotes significance at 1 percent level. * Denotes significance at 5 percent level.

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[2]See Baltagi (2001) for explanation of panel data estimation method.

Table 4: The Result of the Determination of FDI in Each of the ASEAN Countries

	Indonesia	Malaysia	Philippines	Singapore	Thailand
constant	-.1259543	-.7409508	-.8586108	-1.512287	.8534822
	(-0.04)	(-0.25)	(-0.28)	(-0.24)	(0.31)
ΔY_{it}	.0002838	.0010591	-.000392	.0030547	-.0000723
	(1.85)	(2.11)*	(-0.82)	(3.24)**	(-0.17)
ΔO_{it}	20.20888	6.30215	20.13836	19.59578	-13.33107
	(0.90)	(0.28)	(0.65)	(0.90)	(-0.43)
ΔR_{it}	33.495	61.38895	-10.61598	-129.7134	51.25409
	(1.14)	(0.43)	(-0.52)	(-0.30)	(0.61)
DI_{it}	1.641519	-7.701342	2.175449	-.1942121	-8.816717
	(0.40)	(-1.58)	(0.64)	(-0.02)	(-2.28)*
DC_{it}	-20.92721	11.76038	-4.987259	3.616264	42.04429
	(-2.15)*	(0.89)	(-0.54)	(0.16)	(2.91)**
ΔG_{it}	-.0207861	.1890393	-.0150518	-1.890955	.4404503
	(-0.23)	(0.54)	(-0.09)	(-1.38)	(0.96)
R^2	0.6111	0.2665	-0.1956	0.1926	0.3687

Note: See Table 3 for explanation.

The finding that the market size is an important factor for the determination of FDI is consistent with the finding of Chung-Sok and Jung-Soo (1988). Nunnenkamp and Spatz (2002), and Carstensen and Toubal (2004), amongst others also reported the importance of the market size in the determination of FDI. On the other hand, the formation of AFTA is found not to have a significant impact on FDI. Chung-Sok and Jung-Soo (1988) also reported that the membership of ASEAN did not contribute to FDI. The impact of Asian financial crisis is generally found not to have a significant adverse impact on FDI in ASEAN countries. This is because FDI is motivated by the long-term prospects of the investors for making profits in production activities that they directly control. However, for Indonesia, the crisis had adversely affected inflows of FDI in that country.

The market size is found to be an important factor for FDI in ASEAN countries, as a group and also each of ASEAN countries, except the Philippines and Thailand. Thus, market-seeking FDI is an important type of FDI in ASEAN countries. The economic growth and stability of the economy are expected to attract more market seeking FDI in ASEAN countries. After Asian financial crisis, most of ASEAN countries achieve a relatively high economic growth and therefore FDI is expected to increase. In other words, as long as economy continues to growth, FDI is expected to increase.

Chadee and Rose (2003) and Pan (2003), amongst others also raised the question of the generalisation of the determination of FDI. Generally, the market size is found to have a significant impact on FDI in the literature of the determination of FDI. For ASEAN countries as a group, the market size is found to have a significant positive impact on FDI. Nonetheless, for each of ASEAN countries, the market size is found to have a significant positive on FDI for Indonesia, Malaysia and Thailand, but not for the Philippines and Thailand. Moreover, most of traditional macroeconomic variables to be considered important for the determination of FDI in the literature are found not important for most of ASEAN countries. Thus, there is no simple generalisation of the determination of FDI. The finding suggests that the determination of FDI should be considered on a case-by-case basic.

The study focuses on the importance of traditional macroeconomic variables on FDI. Nonetheless, other non-traditional macroeconomic variables such as human capital, infrastructure, transparency of the government and political stability are important for the determination of FDI, which are to be considered. Nunnenkamp and Spatz (2002) and Carstensen and Toubal (2004), amongst others considered other non-traditional macroeconomic variables on FDI.

CONCLUDING REMARKS

The aims of the study are to investigate the determination of FDI in ASEAN countries as a group and also the determination of FDI in each of ASEAN countries. For ASEAN countries as a group, the result shows that the market size is found to have an important impact on FDI. Factors such as AFTA and Asian financial crisis are found not to have a significant impact on FDI. For each of ASEAN countries, the result shows about the same conclusion as those obtained for ASEAN countries as a group, but various across countries. Market seeking FDI is an important type of FDI in ASEAN countries. Also, there is no simple generalisation of the determination of FDI. Nonetheless, more studies should be carried-out to clarify the finding.

REFERENCES

Appleyard, D.R. and Field, A.J. (2001), *International Economics*, Fourth Edition, Singapore: McGraw-Hill.

Athukorala, P-C and Menon, J. (1996), "Foreign Direct Investment in ASEAN: Can AFTA Make a Difference?" in Joseph L.H. Tan, ed., *AFTA in the Changing International Economy*, Singapore: Institute of Southeast Asian Studies.

Baltagi, B.H. (2001), *Econometric Analysis of Panel Data*, Second Edition, New York, United States: John Wiley and Sons.

Billington, N. (1999), The Location of Foreign Direct Investment: An Empirical Analysis, *Applied Economics*, 31(1): 65-78.

Carstensen, K. and Toubal, F. (2004), Foreign Direct Investment in Central and Eastern European Countries: A Dynamic Panel Analysis, *Journal of Comparative Economics*, 32: 3-22.

Caves, R.E. (1971), International Corporations: The Industrial Economics of Foreign Investment, *Economica*, 38: 1-27.

Chadee, D.D. and Rose, E.L. (2003), Research on Foreign Direct Investment: Introduction to the Special Issue, *Journal of Business Research*, 56: 777-778.

Cheng, L.K. and Kwan, Y.K. (2000), What are the Determinants of the Location of Foreign Direct Investment? The Chinese Experience, *Journal of International Economics*, 51(2): 379-400.

Chi-Hung, K. (1996), "A New Wave of Foreign Direct Investment in Asia", in Dilip K. Das, ed., *Emerging Growth Pole: The Asia-Pacific Economy*, 157-179, Singapore: Prentice Hall.

Chung-Sok, S. and Jung-Soo, S. (1998), "Trends in the Pattern of Foreign Direct Investment: The Case of the Asia-Pacific Region", Amnon Levy-Livermore, ed., *Handbook on the Globalization of the World Economy*, 123-146, Cheltenham, United Kingdom: Edward Elgar.

Dunning, J.H. (1993), *Multinational Enterprises and the Global Economy*, Harlow, England: Addison-Wesley.

Dutt, A.K. (1998), "Gloalization, Foreign Direct Investment and Southern Growth: Evidence from Selected Asian Countries", in Chen John-Ren, ed., *Economic Effects of Globalization*, England: Ashgate.

Erdal, F. and Tatoglu, E. (2002), Locational Determinants of Foreign Direct Investment in an Emerging Market Economy: Evidence from Turkey, *Multinational Business Review*, 10(1): 1-7.

Kim, J-II and Lau, L.J. (1994), The Sources of Economic Growth of the East Asian Newly Industrialized Countries, *Journal of the Japanese and International Economics*, 8(3): 235-271.

Lim, E-G. (2001), Determinants of, and the Relation between, Foreign Direct Investment and Growth: A Summary of the Recent Literature, *International Monetary Fund Working Paper*, WP/01/175.

Love, J.H. and Lage-Hidalgo, F. (2000), Analysing the Determinants of US Direct Investment in Mexico, *Applied Economics*, 32(10): 1259-1272.

Markusen, J. and Venables, A. (1999), Foreign Direct Investment as a Catalyst for Industrial Development, *European Economic Review*, 43(2): 335-356.

Motta, M. and Norman, G. (1996), Does Economic Integration Cause Foreign Direct Investment? *International Economic Review*, 37(4): 757-783.

Noorbakhsh, F., Paloni, A. and Youssef, A. (2001), Human Capital and FDI Inflows to Developing Countries: New Empirical Evidence, *World Development*, 29(9): 1593-1610.

Nunnenkamp, P. and Spatz, J. (2002), Determinants of FDI in Developing Countries: Has Globalization Changed the Rules of the Game? *Transnational Corporations*, 11(2): 1-34.

Nyatepe-Coo, A.A. (1998), "Foreign Direct Investment and Economic Growth in Selected LDCs, 1963-92", in Amnon Levy-Livermore, ed., *Handbook on the Globalization of the World Economy*, 87-99, Cheltenham, United Kingdom: Edward Elgar.

Pan, Y. (2003), The Inflow of Foreign Direct Investment to China: The Impact of Country-Specific Factors, *Journal of Business Research*, 56: 829-833.

Phang, H.E. (1998), *Foreign Direct Investment: A Study of Malaysia's Balance of Payments Position*, Selangor Darul Ehsan, Malaysia: Pelanduk Publications.

Phillips, P.C.B. and Perron, P. (1988), Testing for a Unit Root in Time Series Regression, *Biometrika*, 75(2): 335-346.

Ramirez, M.D. (2000), Foreign Direct Investment in Mexico: A Cointegration Analysis, *The Journal of Development Studies*, 37(1): 138-162.

Rodgers, J.R. (1998), "From Bretton-Woods to the World Trade Organization and the Formation of Regional Trading Blocs", in Amnon Levy-Livermore, ed., *Handbook on the Globalization of the World Economy*, 199-225, Cheltenham, United Kingdom: Edward Elgar.

Romer, D. (2001), *Advanced Macroeconomics*, Second Edition, Singapore: McGraw-Hill.

Shatz, H.J. and Venables, A.J. (2000), "The Geography of International Investment," in G.L. Clark, M.P. Feldman and M.S. Gertler, eds., *The Oxford Handbook of Economic Geography*, 125-145.

Tan, G. (1996), *ASEAN Economic Development and Co-operation*, Singapore: Time Academic Press.

United Nations Conference on Trade and Development (UNCTAD). (1993), *World Investment Report 1993: Transnational Corporations and Integrated International Production*, New York, United States: UNCTAD.

United Nations Conference on Trade and Development (UNCTAD). (2001), *World Investment Report 2001: Promoting Linkages*, New York, United States: UNCTAD.

United Nations Conference on Trade and Development (UNCTAD). (2002), *World Investment Report 2002: Transnational Corporations and Export Competitiveness*, New York, United States: UNCTAD.

Yamazawa, I. (1992), On Pacific Economic Integration, *The Economic Journal*, 102: 1519-1529.

Zhang, K.H. (2001), How Does Foreign Direct Investment Affect Economic Growth in China? *Economics of Transition*, 9(3): 679-693.

Some Empirical Evidence on the Quantity Theoretic Proposition of Money in ASEAN-5

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ABSTRACT

This study examines the international evidence on long-run neutrality (LRN) of money based on low frequency data from five emerging ASEAN economies, namely, Indonesia, Malaysia, the Philippines, Singapore, and Thailand, using a nonstructural reduced-form bivariate ARIMA model proposed by Fisher and Seater (1993). Empirical evidence shows that the classical proposition cannot be rejected with respect to real export except for Thailand. However, the LRN test results are not robust to a change in the country under study with respect to real output. The narrow monetary aggregate seems to have greater influential impact towards the Indonesia, Malaysia, and Thailand economic activities as compared to the other two countries.

INTRODUCTION

The study on the relationship between money supply and real economic activity has created much debate both theoretically and empirically. Researchers try to examine the consequences of innovation in money supply towards real macroeconomics variables, by investigating different countries at different time period with the assistance of various econometric techniques. The controversy over this issue, however, remains unsolved. The debate regarding the role of money in the economy finds its origins in the classical quantity theory of money. It is believed that real economic variables in the economy are determined by real forces and those monetary forces only affected nominal quantities. The inability of changes in the stock of money to affect real economic activity except for the general price level is called the long-run neutrality (LRN) of money.

The classical economists believed that the markets could always be in the most efficient condition without the intervention of government. Supply should always equal demand as the price levels can be adjusted immediately and completely to the shocks in the economy. Therefore, the role of money has been relegated to the background, and money is said to be long run neutral in the classical world. In contrary, the Keynesian economists propose that government should take an active role in the markets. They do not believe on the self-correcting mechanism in the markets, as prices are somewhat rigid in the present of menu costs and efficiency wages. Consequently, the government could use discretionary monetary policy to moderate fluctuations in the business cycle. Thus, Keynesian economists contend that money is non-neutral in the long run.

In view of the theoretical controversial over the role of money, the empirical work should be carried out to provide a better understanding on how money affect output in different countries and level of development (i.e. developed versus less developed economies). Interestingly, the empirical evidence on LRN has been in a state of flux. While some studies found supportive evidence on LRN proposition, others discover that money supply do have influential effects on real economic activity in the short as well as long-run. Furthermore, most of the empirical studies on the LRN were conducted for one or a group of developed countries, with little attention given to the less developed emerging economies.

The objective of this study is to provide some empirical evidence on the LRN of money supply in five ASEAN developing countries of Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Since earlier studies on monetary neutrality in Asian developing countries are limited, our study helps to add knowledge on this area. In order to test for the quantity theoretic proposition, we utilize the bivariate reduced-form ARIMA model, proposed by Fisher and Seater (1993, hereafter FS). Specifically, we examine the long run effect of the permanent shocks of narrow money supply on real export and real output in these ASEAN economies.

The remainder of this paper is organized as follows. Section II provides the relevant literature on LRN. The methodology and data used in the analysis will be discussed in Section III. Section IV presents the empirical findings, and concluding remarks are given in Section V.

REVIEW ON LONG-RUN NEUTRALITY OF MONEY

The classical definition of LRN of money implies that the autonomous changes in the level of money supply do not have long run effect on the level of real economic activity. There are many approaches to test for LRN propositions, and a leading method is given by FS. They derive a simple and relatively structural free model for testing the classical hypothesis. In their writing in the American Economic Review (1993, pp. 402), FS state that: "*Because LRN and LRSN[1] do not depend on the short-run dynamics of the economy, structural details that are important for many issues are not relevant to LRN and LRSN. It is desirable, therefore, to have tests of LRN and LRSN that are relatively structure-free. A convenient setting for nonstructureal tests is provided by a multivariate ARIMA model*". The simplicity of FS's LRN test has lead to voluminous empirical studies of the consequences of money supply shocks on real economic activity in both developed and developing countries.

Using US annual observations from 1869 to 1975, FS found that the LRN held with respect to prices and nominal income, but it is rejected with respect to real income. Boschen and Otrok (1994) re-examine the empirical study by FS using the same data set (updated by them to include the 1976-92 period). They point out that the rejection of LRN by FS is due to the inclusion of the Great Depression decade of 1930-39. On the other side, Haug and Lucas (1997) found support for the LRN in Canada. They further claim that bank failures alone should not entirely be accounted for the rejection of LRN when data from the period of the 1930's are included in the sample.

Malliaropulos (1995) provides empirical evidence on the LRN in UK based on FS's model. Using quarterly data on money supply (M4), consumer prices, real GDP, nominal GDP, and equity prices, Malliaropulos found that money does not matter with respect to real GDP and real equity prices in the long run. Nevertheless, permanent innovations in money stock do have transitory real effects on UK economy for the period under study. With the same methodology and using Backus and Kehoe (1992) long, low-frequency data set, Serletis and Krause (1996) also found supportive evidence of the quantity theoretic proposition for Australia, Canada, Denmark, Italy, UK and US.

For the Mexican economy, for the period 1932 to 1992, Wallace (1999) found out that the LRN proposition holds for both money supply, M1 and M2. By updating the Mexican data set to 2000, Noriega (2000), however, discovers that LRN only holds for M2 when he re-examines Wallace's LRN test using Pantula's (1989) sequential unit root tests. Noriega, therefore, claims that the LRN tests are sensitive to both the sample size and the testing procedure used. In particular, it is especially important to conduct a proper unit root test in order to find out the "right" order of integration.

Leong and McAleer (2000) utilise both quarterly seasonally adjusted and unadjusted Australian real GDP and nominal money supply to test the neutrality hypothesis. They found that the neutrality tests are sensitive to the type of money supply used. While the LRN hypothesis is supported using narrow money supply, M1; it is rejected when M3, a broader measure of money is used. They further claim that this disparity might be due to the recent trends and developments in the money and credit markets in Australia.

Noriega (2003) considers the LRN tests based on FS model using low-frequency data on real output and money aggregates for Argentina, Australia, Brazil, Canada, Denmark, Italy, Mexico, Sweden, UK, and US. Noriega claims that the unit root tests are not robust with different testing methodologies. M2 is found to be LRN with respect to real output in Brazil, Canada, Sweden, and Mexico. For Argentina, Australia, Italy, Mexico, and the UK, M1 does matter. Apart from that, Noriega found no direct evidence in favor of LRN based on unit root tests on the data of Denmark and the US.

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[1] LRSN refer to long-run superneutrality of money.

METHODOLOGY AND DATA

In this study, we employ the dynamic simultaneous equation model developed by FS to test for the LRN proposition with respect to real output and real export in five ASEAN economies using the narrow money supply, M1. Let m be log money stock and y the log of real economic activity. The model is given as follows:

$$a(L)\Delta^{\langle m\rangle}m_t = b(L)\Delta^{\langle y\rangle}y_t + u_t$$

(1)

$$d(L)\Delta^{\langle y\rangle}y_t = c(L)\Delta^{\langle m\rangle}m_t + w_t$$

where Δ represent the first differences, $a(L)$, $b(L)$, $c(L)$ and $d(L)$ are distributed lag polynomials in the lag operator L, with $a_0 = d_0 = 1$, and b_0 and c_0 are not restricted. $\langle m\rangle$ and $\langle y\rangle$ are the orders of integration of the money supply and real economic activity.

Let $x_t \equiv \Delta^i m_t$ and $z_t \equiv \Delta^j y_t$, where i and j equal 0 or 1, FS then defined the LRN in terms of the long-run derivative (LRD) of z with respect to a permanent change in x as follows:

$$LRD_{z,x} \equiv \lim_{k\to\infty} \frac{\partial z_{t+k}/\partial u_t}{\partial x_{t+k}/\partial u_t}$$

(2)

where $\lim_{k\to\infty} \partial x_{t+k}/\partial u_t \neq 0$. If $\lim_{k\to\infty} \partial x_{t+k}/\partial u_t = 0$, there will be no permanent changes in the level of money and thus the LRN proposition cannot be tested. $LRD_{z,x}$ expresses the ultimate effect of an exogenous money disturbance on z relative to that disturbance's ultimate effect on x. As such, the specific value of the $LRD_{z,x}$ depends on $\langle x\rangle$ and $\langle z\rangle$.

If the order of integration of real and monetary variables are both at least equal to or greater then one, the $LRD_{z,x}$ can be measured using the impulse response representation for x and z which is given by the solution of Equation (1). A special case occur when $\langle x\rangle = \langle z\rangle = 1$, where $LRD_{z,x}$ becomes $c(1)/d(1)$, which is a measures of the relationship between the permanent changes in real economic activity with respect to permanent stochastic changes in money aggregate. LRN requires that $LRD_{z,x} = 1$ if z is a nominal variable, and $LRD_{z,x} = 0$ if z is a real variable.

Assuming the money supply is exogenous and the error term is *iid* $(0,\sigma^2)$, the term $c(1)/d(1)$ is the Bartlett estimator of frequency-zero coefficient in a regression of $\Delta^{\langle y\rangle}y_t$ on $\Delta^{\langle m\rangle}m_t$. An estimate of $c(1)/d(1)$ is given by $\lim_{k\to\infty}\beta_k$, where β_k is the slope coefficient from the following OLS regression:

$$\left[\sum_{j=0}^{k}\Delta^{\langle y\rangle}y_{t-j}\right] = \alpha_k + \beta_k\left[\sum_{j=0}^{k}\Delta^{\langle m\rangle}m_{t-j}\right] + \varepsilon_{kt}$$

(3)

When $\langle m\rangle = \langle y\rangle = 1$, Equation (3) becomes:

$$(y_t - y_{t-k-1}) = \alpha_k + \beta_k(m_t - m_{t-k-1}) + \varepsilon_{kt}$$

(4)

The null hypothesis of LRN is $\beta_k = 0$. The non-rejection of the null hypothesis indicates the data supports the LRN proposition.

Data Descriptions

This study makes use of annual data spanning from 1970 to 2001 on narrow money supply (M1), real export and real output from five emerging ASEAN economies, namely Indonesia, Malaysia, the Philippines, Singapore, and Thailand. All data were collected from various issues of the *International Financial Statistics* published by International Monetary Fund (IMF). All series were in the natural logarithm form.

THE EMPIRICAL RESULTS

Time Series Properties of the Data

Following FS, the order of integration of money supply should be at least equal to one for LRN tests to make sense, or there will be no stochastic permanent innovations in the level of money that can affect the real economic variables. In particular, LRN tests require both nominal and real variables are at least integrated of order one and of the same order of integration. As such, the first step in conducting the LRN tests is to determine whether the time series are actually non-stationary and the degree to which they are integrated if they do not contain a unit root. To do so, we utilize the Augmented Dickey-Fuller (ADF) (Said and Dickey, 1984) unit root tests to check for the non-stationarity property of the data. Since the unit root tests results are sensitive to different values of the autoregressive lag length, the selection rule of the truncation lag parameter is crucial in determining the order of integration of the data. In this study, the optimal lag length is chosen based on the Schwartz Information Criterion (SIC) to ensure the errors are white noise.

Table 1 presents the ADF *t*-statistics that describing the stationary properties of M1, real export and real output in the ASEAN-5 countries. We report the results, which contain drift and a deterministic trend for the series in levels and drift without a deterministic trend for the series in first differences. Then, we compare the results with the critical value provided by MacKinnon (1991). As shown in Table 1, we fail to reject the null hypothesis of a unit root in their levels, indicating that the series are not in the trend-stationary process. In their first differences, however, all series appear to be stationary. In other words, all series are said to be integrated of order one, that is $I(1)$, which in term implies that the LRN restriction $c(1)/d(1)$ is testable.

Table 1: ADF Unit Root Test Results

Country & Series	Level with trend		First difference without trend	
	Test statistic	Lag length	Test statistic	Lag length
Indonesia				
RY	-0.975	0	-4.216***	0
LRX	-2.132	0	-3.999***	0
LM1	-2.200	1	-3.580**	0
Malaysia				
LRY	-2.219	0	-5.107***	1
LRX	-3.085	0	-5.768***	1
LM1	-1.821	0	-5.469***	0
Philippines				
LRY	-2.233	0	-5.752***	1
LRX	-1.689	0	-5.847***	0
LM1	-3.198	0	-5.464***	1
Singapore				
LRY	-2.636	1	-3.356**	0
LRX	-1.676	0	-5.376***	0
LM1	-1.895	0	-5.208***	0
Thailand				
LRY	-1.968	1	-3.077**	0
LRX	-2.039	0	-5.978***	0
LM1	-3.037	0	-5.429***	1

Note: Asterisks (**) and (***) indicate significant at the 5% and 1% level respectively.

Serletis and Koustas (1998) and Koustas and Serletis (1999) contend that the LRN tests are inefficient in the presence of cointegration. If money supply and real macro variables have long-run equilibrium relationship, then money should not be considered as neutral in the long run. Subsequently, the second step is to confirm the condition, that is, meaningful for the LRN tests by finding the cointegrated relations within the blocks of real and monetary variables. Table 2 reports the Johansen and Juselius (1990) maximum likelihood (ML) cointegration tests results. The required numbers of lag (l) in the VARs are selected by means of the Schwarz Bayesian Criterion (SBC). Empirical results show that both trace and λ-max statistics are insignificant at five percent level, implying that there is no common trend exists within the two-variable set data for all the country under study.

The Long-Run Neutrality Test Results

Results on the properties of time series from the unit root and cointegration tests suggest that all the countries confirm the conditions require under the LRN tests. Equation (4) is then estimated for each of the country with k equal 1-11. The lag length k is chosen by $n/3$, where n is the number of observations. The error term, ε_{kt}, from the regression for the various lags may be non-spherical, possibly leading to biased t-ratios and outcomes of the LRN tests. In view of that, following FS, the standard error of β_k has been calculated using the Newey and West (1987) procedure to correct for heteroskedasticity and autocorrelation. Estimated results of Equation (4) are then presented in the tabulate form for the five countries under study. We present the values of estimated coefficients (β_k), Newey-West standard error (SE_k), t-statistic of null hypothesis (t_k), and the marginal significance level of null hypothesis (p-value). The null hypothesis is $\beta_k = 0$ for y is a real variable.

Table 2: Results of Johansen and Juselius Cointegration Test

Country	l	M1, Real Output							
		H_0	H_A	λ-trace	95% CV	H_0	H_A	λ-max	95% CV
Indonesia:	1	r = 0	r ≥ 1	9.93	17.86	r = 0	r = 1	8.06	14.88
		r ≤ 1	r = 2	1.88	8.07	r ≤ 1	r = 2	1.88	8.07
Malaysia:	1	r = 0	r ≥ 1	15.99	17.86	r = 0	r = 1	14.03	14.88
		r ≤ 1	r = 2	1.96	8.07	r ≤ 1	r = 2	1.96	8.07
Philippines:	1	r = 0	r ≥ 1	6.85	17.86	r = 0	r = 1	5.75	14.88
		r ≤ 1	r = 2	1.10	8.07	r ≤ 1	r = 2	1.10	8.07
Singapore:	1	r = 0	r ≥ 1	10.74	17.86	r = 0	r = 1	6.75	14.88
		r ≤ 1	r = 2	3.98	8.07	r ≤ 1	r = 2	3.98	8.07
Thailand:	2	r = 0	r ≥ 1	14.94	17.86	r = 0	r = 1	13.30	14.88
		r ≤ 1	r = 2	1.63	8.07	r ≤ 1	r = 2	1.63	8.07

Country	l	M1, Real Export							
		H_0	H_A	λ-trace	95% CV	H_0	H_A	λ-max	95% CV
Indonesia:	1	r = 0	r ≥ 1	15.19	17.86	r = 0	r = 1	14.86	14.88
		r ≤ 1	r = 2	0.31	8.07	r ≤ 1	r = 2	0.31	8.07
Malaysia:	1	r = 0	r ≥ 1	12.69	17.86	r = 0	r = 1	11.43	14.88
		r ≤ 1	r = 2	1.26	8.07	r ≤ 1	r = 2	1.26	8.07
Philippines:	1	r = 0	r ≥ 1	6.18	17.86	r = 0	r = 1	4.09	14.88
		r ≤ 1	r = 2	2.09	8.07	r ≤ 1	r = 2	2.09	8.07
Singapore:	3	r = 0	r ≥ 1	11.03	17.86	r = 0	r = 1	8.32	14.88
		r ≤ 1	r = 2	2.72	8.07	r ≤ 1	r = 2	2.72	8.07
Thailand:	4	r = 0	r ≥ 1	11.92	17.86	r = 0	r = 1	11.54	14.88
		r ≤ 1	r = 2	0.39	8.07	r ≤ 1	r = 2	0.39	8.07

Notes: Asterisks (**) indicate significant at the 5% level. Critical values are taken from Table 1, Osterwald-Lenum (1992). Lag selection is based on SBC.

LRN of M1 with respect to real output: Results from estimating Equation (4) are reported in Tables 3 (a) to 7 (a). A mixture of empirical results has detected in this study that the LRN proposition is supported for some countries but it is rejected in others. We found that the null hypothesis of slope coefficient β_k equals zero cannot be rejected at all k values for the Philippines and Singapore. Hence, we conclude that M1 does not matter in these two countries. However, the estimated coefficients are positive and statistically significant from zero at five percent significance level at $k < 8$ for Malaysia, at $2 < k < 7$ for Thailand and at all k values for Indonesia. This implies that permanent changes in narrow money supply do have positive transitory effects, in short to medium term, on the level of real output in Malaysia and Thailand. For Indonesia, M1 can be treated as an independent stimulus to the real output in the long run.

LRN of M1 with respect to real export: Generally, the classical proposition is more supported when real export and M1 are used. The estimated results of running Equation (4) are presented in Tables 3 (b) to 7 (b). Except for Thailand, the slope coefficients for money supply are all statistically insignificant at the conventional level. This means that the narrow money supply might not be the primer engine for the rapid growth of export in these four ASEAN countries during the period under study. In other words, the financial-led export growth hypothesis does not hold in the context of narrow monetary aggregate. For Thailand, however, the null hypothesis of $\beta_k = 0$ can be rejected at all k values that are greater than 6, indicating the real export activity is not neutral to the innovations in narrow monetary forces.

Table 3 (a): Indonesia Long-run regressions of real output on M1

k	β_k	SE_k	t_k	p-value
1	0.342	0.081	4.214	0.000
2	0.383	0.121	3.169	0.004
3	0.368	0.123	2.985	0.006
4	0.325	0.092	3.521	0.002
5	0.292	0.076	3.848	0.001
6	0.269	0.063	4.243	0.000
7	0.249	0.055	4.556	0.000
8	0.231	0.049	4.735	0.000
9	0.214	0.044	4.822	0.000
10	0.203	0.043	4.682	0.000
11	0.197	0.044	4.502	0.000

Table 3 (b): Indonesia Long-run regressions of real export on M1

k	β_k	SE_k	t_k	p-value
1	0.825	0.428	1.927	0.064
2	0.836	0.566	1.478	0.151
3	0.751	0.579	1.296	0.206
4	0.679	0.542	1.252	0.222
5	0.649	0.551	1.179	0.250
6	0.593	0.524	1.132	0.269
7	0.486	0.459	1.060	0.301
8	0.370	0.385	0.960	0.348
9	0.260	0.318	0.816	0.424
10	0.202	0.289	0.698	0.494
11	0.173	0.276	0.627	0.538

Table 4 (a): Malaysia Long-run regressions of real output on M1

k	β_k	SE_k	t_k	p-value
1	0.240	0.096	2.498	0.019
2	0.193	0.091	2.115	0.044
3	0.170	0.085	1.986	0.058
4	0.167	0.073	2.290	0.031
5	0.177	0.064	2.774	0.011
6	0.194	0.070	2.790	0.010
7	0.227	0.095	2.391	0.026
8	0.289	0.145	1.990	0.060
9	0.360	0.212	1.694	0.106
10	0.454	0.260	1.746	0.097
11	0.499	0.271	1.841	0.082

Table 4 (b): Malaysia Long-run regressions of real export on M1

k	β_k	SE_k	t_k	p-value
1	0.013	0.232	0.057	0.955
2	-0.050	0.202	-0.248	0.806
3	-0.066	0.189	-0.348	0.730
4	-0.075	0.162	-0.464	0.647
5	-0.072	0.150	-0.478	0.637
6	-0.040	0.168	-0.240	0.812
7	0.051	0.226	0.226	0.823
8	0.233	0.335	0.697	0.494
9	0.444	0.473	0.938	0.359
10	0.695	0.553	1.256	0.224
11	0.812	0.554	1.466	0.160

Table 5 (a): Philippines Long-run regressions of real output on M1

k	β_k	SE_k	t_k	p-value
1	0.092	0.096	0.962	0.344
2	0.052	0.085	0.611	0.546
3	0.034	0.080	0.424	0.675
4	0.027	0.080	0.335	0.740
5	0.024	0.083	0.286	0.777
6	0.017	0.085	0.202	0.842
7	0.011	0.088	0.122	0.904
8	0.002	0.090	0.024	0.981
9	-0.006	0.092	-0.065	0.949
10	-0.014	0.093	-0.147	0.885
11	-0.020	0.093	-0.215	0.833

Table 5 (b): Philippines Long-run regressions of real export on M1

k	β_k	SE_k	t_k	p-value
1	0.093	0.354	0.262	0.795
2	-0.071	0.359	-0.197	0.846
3	-0.113	0.328	-0.346	0.732
4	-0.092	0.293	-0.316	0.755
5	-0.019	0.251	-0.074	0.942
6	0.049	0.230	0.211	0.834
7	0.093	0.236	0.393	0.698
8	0.094	0.258	0.365	0.719
9	0.075	0.275	0.273	0.788
10	0.051	0.287	0.179	0.860
11	0.028	0.293	0.094	0.926

Table 6 (a): Singapore Long-run regressions of real output on M1

k	β_k	SE_k	t_k	p-value
1	0.176	0.079	2.231	0.034
2	0.146	0.093	1.575	0.127
3	0.121	0.092	1.320	0.198
4	0.115	0.090	1.276	0.214
5	0.146	0.096	1.523	0.141
6	0.171	0.103	1.669	0.109
7	0.181	0.106	1.706	0.102
8	0.186	0.106	1.745	0.096
9	0.192	0.105	1.835	0.081
10	0.199	0.103	1.932	0.068
11	0.203	0.103	1.976	0.064

Table 6 (b): Singapore Long-run regressions of real export on M1

k	β_k	SE_k	t_k	p-value
1	-0.432	0.273	-1.585	0.124
2	-0.516	0.281	-1.837	0.077
3	-0.506	0.322	-1.571	0.128
4	-0.436	0.379	-1.149	0.261
5	-0.371	0.409	-0.907	0.374
6	-0.341	0.426	-0.800	0.432
7	-0.308	0.422	-0.729	0.474
8	-0.222	0.361	-0.614	0.546
9	-0.130	0.280	-0.463	0.648
10	-0.044	0.199	-0.222	0.827
11	0.003	0.154	0.019	0.985

k	β_k	SE_k	t_k	*p*-value
1	0.081	0.062	1.312	0.200
2	0.085	0.047	1.819	0.080
3	0.099	0.040	2.468	0.021
4	0.123	0.033	3.663	0.001
5	0.140	0.034	4.130	0.000
6	0.133	0.046	2.867	0.009
7	0.122	0.060	2.025	0.055
8	0.112	0.069	1.633	0.117
9	0.114	0.073	1.550	0.137
10	0.115	0.075	1.533	0.142
11	0.111	0.074	1.492	0.153

Table 7 (a): Thailand
Long-run regressions of real output on M1

k	β_k	SE_k	t_k	*p*-value
1	-0.135	0.243	-0.557	0.582
2	-0.178	0.256	-0.696	0.492
3	-0.118	0.287	-0.411	0.684
4	0.029	0.343	0.084	0.934
5	0.291	0.427	0.681	0.503
6	0.695	0.459	1.517	0.143
7	1.097	0.409	2.681	0.014
8	1.345	0.386	3.484	0.002
9	1.361	0.370	3.683	0.002
10	1.279	0.335	3.821	0.001
11	1.166	0.299	3.902	0.001

Table 7 (b): Thailand
Long-run regressions of real export on M1

CONCLUSION

In this study, we employ the bivariate reduced-form ARIMA model proposed by FS to give some empirical evidence on the LRN of monetary policy in five ASEAN developing economies. The ADF unit root tests provide direct evidence in favour of the LRN tests in these ASEAN countries. Empirical results further show that the LRN is generally holds with respect to real export except for Thailand. With respect to real output, however, the narrow money supply seems to have greater influential consequences on the economies of Indonesia. Nevertheless, for other ASEAN countries, in particular, the M1 has short to medium term positive transitory real effect on Malaysia and Thailand. In view of this, we conclude that LRN is a general feature of the five ASEAN emerging economies. Our findings are consistent with Moosa (1997), who found supportive evidence of LRN in the context of a developing economy, India.

The inability of monetary policy to affect real economic activities is probably due to the recent development in the financial markets in the Asian emerging economies. Researches show that the financial liberalization in any economy will create new problems for the monetary authorities to effectively pursue their monetary policy. For instance, Tseng and Corker (1993) have conducted an empirical study on nine Asian developing countries, which include Indonesia, Malaysia, Myanmar, Nepal, the Philippines, Singapore, Sri Lanka, South Korea, and Thailand. They have pointed out that "*Financial liberalization brought many new challenges for the monetary authorities of these countries,... In particular, financial liberalization has altered the relationship between money, income, and interest rates, complicating the interpretation of developments in monetary aggregates.*"
Although financial deregulation and innovation can enhance the effectiveness of monetary policy, it might also distort the relationship between monetary aggregates and other macroeconomic variables. As the financial markets developed, the role of non-bank institutions becomes more apparent, and the shift of money to the interest-bearing financial assets offered by the non-bank institutions will subsequently affect the stability of money demand function. Laumas and Porter-Hudak (1986) argue that a measurable and stable money demand function is necessary for the monetary policy to be effective. As a result of increasingly difficult to target on a particular monetary aggregate in order to attain the ultimate objectives, some of the monetary authorities in Asian developing countries have shifted away from monetary targeting to other intermediate targets such as inflation targeting and interest rate targeting.

REFERENCES

Backus, D.K., & Kehoe, P.J. (1992). International evidence on the historical properties of business cycles. *American Economic Review*, *82*, 864-888.

Boschen, J.F., & Otrok, C.M. (1994). Long-run neutrality and superneutrality in an ARIMA framework: Comment. *American Economic Review*, *84*, 1470-1473.

Fisher, M.E., & Seater, J.J. (1993). Long-run neutrality and superneutrality in an ARIMA framework. *American Economic Review*, *83*, 402-415.

Haug, A.A., & Lucas, R.F. (1997). Long-run neutrality and superneutrality in an ARIMA Framework: Comment. *American Economic Review*, *87*, 456-459.

International Monetary Fund, *International Financial Statistics*, various issues. Washington, D.C.: IMF.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimated and inference on cointegration with application to the demand for money. *Oxford Bulletin of Economics and Statistics*, *52*, 169-210.

Koustas, Z., & Serletis, A. (1999). On the Fisher effect. *Journal of Monetary Economics*, *44*, 105-130.

Laumas, P.S., & Porter-Hudak, S. (1986). Monetization, economic development and the exogeneity of money. *Journal of Development Economics*, *21*, 25-34.

Leong, K., & McAleer, M. (2000). Testing long-run neutrality using intra-year data. *Applied Economics*, *32*, 25-37.

MacKinnon, J. (1991). Critical values for cointegration tests. In R.F. Engle & C.W.J. Granger (Eds.), *Long-run economic relationship: Readings in cointegration* (pp. 267-276). New York: Oxford University Press.

Malliaropulos, D. (1995). Testing long-run neutrality of money: Evidence from the UK. *Applied Economics Letters*, *2*, 347-350.

Moosa, I.A. (1997). Testing the long-run neutrality of money in a developing economy: The case of India. *Journal of Development Economics*, *53*, 139-155.

Newey, W.K., & West, K.D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica*, *55*, 703-708.

Noriega, A.E. (2000). *Neutrality and superneutrality of money in the Mexican economy: Further evidence under sequential unit root testing*. Department of Econometrics Discussion Paper EM00-1, University of Guanajuato.

Noriega, A.E. (in press). Long-run monetary neutrality and the unit-root hypothesis: Further international evidence. *North American Journal of Economics and Finance*.

Osterwald-Lenum, M. (1992). A note with quantiles of the asymptotic distribution of the maximum likelihood cointegration rank test statistics. *Oxford Bulletin of Economics and Statistics*, *54*, 461-472.

Pantula, S.G. (1989). Testing for unit roots in time series data. *Econometric Theory*, *5*, 256-271.

Said, S.E., & Dickey, D.A. (1984). Testing for unit root in autoregressive-moving average of unknown order. *Biometrika*, *71*, 599-607.

Schwert, G.W. (1987). Effects of model specification tests for unit root in macroeconomic data. *Journal of Monetary Economics*, *20*, 73-103.

Serletis, A., & Koustas, Z. (1998). International evidence on the neutrality of money. *Journal of Money, Credit and Banking*, *30*, 1-25.

Serletis, A., & Krause, D. (1996). Empirical evidence on the long-run neutrality hypothesis using low-frequency international data. *Economics Letters*, *50*, 323-327.

Tseng, W., & Corker, R. (1993). SEACEN study on monetary policy and financial reform. In A. Talid (Ed.), *Monetary policy in the SEACEN countries: An update*. Kuala Lumpur: The South East Asian Central Banks (SEACEN) Research and Training Centre.

Wallace, F.H. (1999). Long-run neutrality of money in the Mexican economy. *Applied Economics Letters*, *6*, 637-639.

The Long Run Relationship Between Money and Income in Malaysia:
A Non-Parametric Cointegration Analysis

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ABSTRACT
This study attempts to detect the presence of long run money-income relationship using two different approaches that is the parametric and non-parametric procedures. In this paper, the widely used Johansen (1988, 1991) cointegration test and the Bierens (1997c) non-parametric cointegration tests are employed. The findings show that while the standard Johansen cointegration test reveals that most of the monetary aggregate measures are not cointegrated with nominal income, clear evidence of cointegration are shown by the Bierens's non-parametric approach, which contrast sharply with a number of existing evidence obtained from the standard cointegration tests. The empirical findings suggest that the potential policy role of monetary aggregate cannot be ruled out.

INTRODUCTION

Until the mid-1990s, the Malaysia's monetary policy strategy had been based on targeting of monetary aggregates. However, far-reaching changes in the economy and financial system have led to the breakdown of the relationship between monetary aggregate and goal variables such as inflation and nominal income. Consequently, towards mid-1990s, the central bank of Malaysia (Bank Negara Malaysia, BNM) shifted its focus from monetary targeting to interest rate targeting[1].

Similar experiences have also been observed in other developing economies. The so-called 'velocity instability' problem – has been the major motivation for central banks to either de-emphasized their monetary aggregate targets or dropped them altogether, in some cases returning to interest-based policy procedure and in others seeking out new organizing principles like direct inflation targets[2].

The question most obviously raised by policy makers evolving the use of such money growth target over the past two decades is how useful are monetary aggregates as intermediate targets or information variables in the conduct of monetary policy. In principle, there are various potential uses for monetary aggregates (see, Friedman, 1996). Monetary aggregates may be useful if they contain information about the underlying contemporaneous state of the economy, by providing a guide for the conduct of monetary policy. If the policy role involves expectations of future variables, then, money can be useful in predicting those variables.[3]

As a matter of fact, in practice, monetary authorities do use monetary aggregates as nominal anchor to target the ultimate policy goals because of its attractive features. First, for the monetary aggregates, the narrower the measurement of money is the better because it can be controlled both quickly and easily by the central bank. It enables a central bank to adjust its monetary policy to cope with domestic considerations.

Second, because of monetary aggregates can be measured quite accurately with short lags (in the case of Malaysia, for example, measures of monetary aggregate appear within one month, BNM, 1999), information on

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[1] BNM, nevertheless, still monitors very closely monetary aggregates, credit growth and other economic and monetary indicators.
[2] Korea, for examples, have explicitly announces an annual inflation target. Singapore, on the other hand, adopting exchange rate targeting.
[3] See Svensson (1999), and Amato and Laubach (2000), for recent discussions on the role of forecasting in monetary policy.

whether the central bank is achieving its target is known almost immediately – announced figures for monetary aggregates are typically reported periodically with very short time lags.

Third, as pointed out in Bernanke and Mishkin (1992), since monetary aggregates are known to the public, using it as a nominal anchor greatly increases the transparency of monetary policy, which can have importance benefits. A monetary target can send almost immediate signals to both the public and markets about the stance of monetary policy and the intentions of the policy makers to keep inflation check. This signal can then help fix inflation expectations and produce less inflation. In addition, the transparency of monetary aggregate targets makes the central bank more accountable to the public to keep inflation low, which can help reduce pressures on the central bank to pursue expansionary monetary policy.

In all of its potential policy role, as stresses by Mishkin (1999), in practice these advantages holds depend crucially on two big *ifs*: 'the biggest if is that there must be a strong and reliable relationships between the goal variable (inflation or nominal income) and the targeted aggregate. If there is velocity instability, so that the relationship between the monetary aggregate and the goal variables is weak, the monetary aggregate targeting will not work.'[4]

Not surprisingly, the existence of a stable long-run relationship linking money to income has been extensively investigated, as it would provide support for money targeting as a policy strategy for monetary authorities. As far as the literature are concerns, there was no conclusive evidence has emerged. While early empirical studies seemed to suggest that a log-linear equation of this kind exhibit stable long run relation (for instances, Friedman and Kuttner, 1992; Feldstein and Stock, 1994), subsequently it became apparent that the relationship had broken down. Yet, the predominant, if not universal, conclusion on the cumulative evidence in favor of long run money-income relationship is not overwhelming (for instances McDougall, 1994; Davis and Tanner, 1997): that the evidence varies with sample periods, methodology, data frequency and different money measures.

The lack of cointegration has been widely undermining the generally well-accepted stable relationship between prior changes in money and income. This weak relationship implies that hitting the target will not produce the desired outcome on the goal variable and thus the monetary aggregate will no longer provide an adequate signal about the stance of monetary policy. Nevertheless, the claim that a stable money-income long run relationship exists has resurfaced in some recent studies. Several attempts in the recent literature have tried to resolve these issues: it has been argued that cointegration can be achieved by adding other variables, such as wealth, financial innovation variables or cumulated interest rates, to a standard money demand function (see, e.g., Hall *et al*. 1990, Hendry and Ericsson, 1991, 1993). This is because velocity is highly trended, and only by including a similar effect that it is possible to build a well-balanced equation.

Alternatively, there are some studies that have looked at the various measurement of monetary aggregate to address the money-income cointegration issue (for the Asian economies, see Habibullah, 1999). This new approach to monetary aggregation was advocated by Barnett (1980) and has led to the construction of monetary aggregates based on Diewert's (1976) class of superlative quantity index number. The Divisia aggregates (also known as monetary services indexes) proposed by Barnett (1980) have been found to be superior to its counterpart the conventional simple-sum aggregate.

Using a comprehensive set of Malaysia's monetary series containing simple-sum and divisia aggregates, the main aim of this study is to examining the long run money-income relationship in Malaysia using two different approaches. To this end, the widely used Johansen cointegration test and the new Bierens' (1997) cointegration test are adopted. The rationale of adopting the nonparametric approach is simply because of its' potential superiority at detecting cointegration when the error correction mechanism is nonlinear. There is a possibility that failure to identify such a long run equilibrium in previous studies simply reflects the adoption of a standard cointegration framework, which assume a constant speed of adjustment.

Also, unlike many standard cointegration tests that are based on a parametric model, the nonparametric test is robust against misspecification and structural break in the short run component and can be used to test a wide range of nonlinear models (Breitung, 2002). On the whole, the empirical results of the present study suggest that although the long run money-income receives limited empirical support from the Johansen method, the evidence from the Bierens approach is overwhelming.

The remainder of the rest of this paper is organized as follows. Section II discusses the econometrics method adopted. The data description and the construction of divisia money are briefly discussed in Section III. This follows by the estimates results reported in Section IV. Lastly, concluding remarks are offered in Sections IV.

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[4] The second if is the degree to which the intermediate target is controlled by monetary authority.

TESTING FOR COINTEGRATION

A substantial part of the economic theory deals with long run equilibrium relationships generated by market forces and behavioral rules. The theoretical relationship between money and income has been a popular topic in the economic research. Monetarists relied on the equation of exchange as a theoretical framework for explaining the relationship between money and income. In this setting, from the identity, MV = PY, where M is the nominal supply, V the velocity of circulation and PY is the nominal income, in accord to monetarist analysis, for long periods, there exist a consistent and precise money-nominal income relationships, since movements in velocity are usually small. And given that the volume of output is determined by real factors, the aggregate price level is mainly influenced by the stock of money.

A key issues here is that whether there existence such relationship, which linked monetary aggregates and nominal income in the long run. If there is no such evidence, then, there is no empirical support for assigning any role in monetary policy to a monetary aggregate. As mentioned earlier, methodologically, there are two different statistical approaches involved in testing the existence of long run money-income relationship in the present study. On one hand, is the standard cointegration procedure, that is, the Johansen (1988, 1991). On the other hand, given that the true Data Generating Process (DGP) of economic time series is generally unknown to the analyst, it might be useful to employ alternative testing procedure, as a consistency cointegration test (Bierens, 1997c). This motivated the use of the recent proposed nonparametric cointegration test suggested by Bierens (1997c).

The Johansen (1988, 1991) Cointegration Test

Johansen suggest a test for determining the number of cointegrating vector among a group of variables based on the vector autoregressive (VAR) system of n x 1 vector of X_t variables.

$$\Delta X_t = \mu + \sum_{i=1}^{k-1} \Gamma_1 \Delta X_{t-1} + \Pi X_{t-k} + \varepsilon_t \tag{1}$$

where $\Gamma_j = -\left(I - \sum_{i=1}^{j} \phi_i\right)$, $\Pi = -\left(I - \sum_{i=1}^{k} \phi_i\right)$, μ is the constant term, I is the identity matrix and the

disturbance vector ε_t of dimension (p x 1) is distributed as an i.i.d. Gaussian process with zero mean and variance Ω (see Johansen (1991) for details). The long run relationships in the data set are determined by the rank of Π. If the series are nonstationary and cointegrated, the Π is not a full rank, but 0 < rank (Π) = r < p, where r is the number of cointegrating vectors. Johansen proposes two likelihood-testing procedures in order to test for the null of no cointegration. The first test is that the number of cointegrating vectors is, at most, equal to r (trace test). The second test of the hypothesis that the number of cointegrating vectors is equal to r (max Eigenvalue test). These statistics are compute as follow:

$$\text{trace} = T \sum_{i=r+1}^{N} In(1-\lambda_i) \text{, and}$$

$$\text{Max-L} = T \ln(1-\lambda_{r+1}) \tag{2}$$

Where r is the number of distinct cointegrating vectors, and $\lambda_{1...\lambda_N}$ are the p squared canonical correlations between the X_{t-p} and Δx_t series.

The Bierens (1997) Cointegration Test

As in most of the cointegration approaches in the literature, the Johansen (1988, 1991) test requires consistent estimation of nuisance and/ or structural parameters. Bierens (1997c) propose consistent cointegration, which do not need specification of the data-generating process, apart from some mild regularity conditions, or estimation of (nuisance) parameters. Such an approach is called 'model free' in Bierens (1997a) and 'nonparametric' in Bierens (1997c). The Bierens cointegration test is conducted analogously to Johansen and Jeselius test: the test statistic involved is obtained from the solutions of a generalized eigenvalue problem, as well as the inclusive of the test for parameter restrictions on the cointegrating vector. However, unlike the Johansen test, Bierens

nonparametric approach has some clear advances, in particular that it does not require specifying a lag length and the deterministic variables of the ECM term, and the critical values are case independent (Bierens, 1997b)[5].

In the same spirit as Johansen's lambda–max test, Bierens considered the lambda-min statistics, $\hat{\lambda}_{n-r_0,m}$, for testing the hypothesis of:

$$H_0(r_0): f = r_0; \qquad H_1(r_0): r = r_0 + 1$$

The Bierens' cointegrating test is based on the generalized eigenvalues of matrices A_m and $(B_m + T^{-2} A_m^{-1})$, where

$$A_m = \frac{8\pi^2}{n} \sum_{k=1}^{m} k^2 \left(\frac{1}{n} \sum_{t=1}^{n} \cos(2k\pi(t-0.5)/n) z_t \right) \times \left(\frac{1}{n} \sum \cos(2k\pi(t-0.5)/n) z_t \right)'$$

$$B_m = 2n \sum_{k=1}^{m} \left(\frac{1}{n} \sum_{t=1}^{n} \cos(2k\pi(t-0.5)/n) \Delta z_t \right) \times \left(\frac{1}{n} \sum_{t=1}^{n} \cos(2k\pi(t-0.5)/n) \Delta z_t \right)' \qquad (3)$$

Which based on weighted means of z_t and Δz_t.

Rather than testing for the number of cointegrating vectors, r, Bierens also provides the $\hat{g}_m(r_0)$ for estimate it consistently, calculated from the generalized eigenvalues:

$$\hat{g}_m(r) = \left(\prod_{k=1}^{q} \hat{\lambda}_{k,m} \right)^{-1} \qquad \text{if r = 0,}$$

$$= \left(\prod_{k=1}^{q-r} \hat{\lambda}_{k,m} \right)^{-1} \left(n^{2r} \prod_{k=q-r+1}^{q} \hat{\lambda}_{k,m} \right) \qquad \text{if r = 1,…, q-1}$$

$$= n^{2q} \prod_{k=1}^{q} \hat{\lambda}_{k,m} \qquad \text{if r = q,} \qquad (4)$$

When the series are found to be cointegrated, Bierens further demonstrated that one could deploy test for linear restriction on the cointegrating vector on the basis of the ordered solutions of the eigenvalue problems as follows:

$$\det[H^T A_m H - \lambda H^T (A_m + T^{-2} A_m^{-1})^{-1} H] = 0 \qquad (5)$$

where H is the hypothesized restricted matrix. The critical values of trace (m = 2q, $F_k(x) = \cos(2k\pi)$) and lambda-max (m = 2q, $F_k(x) = \cos(2k\pi)$) statistics are given in Bierens (1997c, Tables 3 and 4).

DATA DESCRIPTIONS AND THE CONSTRUCTION OF DIVISIA AGGREGATES

To detect the existence of long run relationship between income and money, the Johansen (1988, 1991) and Bieren nonparametric tests are applied on the simple sum M1, M2 and the divisia money M1, M2 originally calculated by Habibullah (1999). As for nominal income, since GDP is only available annually, quarterly data are interpolated from annual observation using Gandolfo (1981) technique. The quarterly time-period considered in this study spanning from 1981:1-1994:4.

The monetary aggregates currently in use by the BNM (and many central banks over the world) are based on simple-sum method of aggregates. The essential property of this method of monetary aggregates is it was calculated on the assumption that their relative prices are constant and receive equal (unitary) weight. Despite of its simplicity, empirical evidence demonstrated by Fleissig and Serletis (1999) indicated that such assumption is unrealistic.

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[5] Caporale *et al.* (1997) argue that the Johansen test procedure is crucially affected by the correct specification of the VAR and show that where an adequate VAR can be achieved the assumption of cointegration is no longer supported.

The Divisia aggregate proposed by Barnett (1980) are based on the so-called superlative class of quantity index numbers.

$$G(Q_t) = \sum_{i=1}^{n} s_{it}^* G(q_{it}) \tag{6}$$

Equation (6) defines the growth rate of a divisia aggregate as the share-weighted average of the growth rates of the component asset quantities. $s_{it}^* = 0.5(s_{it} + S_{i,t-1})$ is the average of expenditure shares from the two adjacent periods and the expenditure share on the services of monetary asset i in period t is measures as

$$s_{it} = p_{it} q_{it} / \sum_j p_{jt} q_{jt} . \tag{7}$$

Where q_{it} and p_{it} respectively, represent the quantities and the user cost of each asset to be included in the aggregate at time t.

The user cost of each asset as derived in Barnett (1978), measures the opportunity cost of the monetary services provided by asset i for the given period is:

$$p_{it} = (R_t - r_{i,j})/(1 + R_t) \tag{8}$$

where R_t is the benchmark rate, the maximum $[r_j, r_i; 1 = 1,2,...,n), j = 1,2,...,k, i \neq k]$. (See Habibullah (1998, 1999) for more detail regarding the divisia approach to monetary aggregate used in the present study).

ESTIMATED RESULTS

Methodologically, the issue of unit root in time series is examined from different perspectives – from the unit root null as well as from the stationary null. In this regard, two non-parametric methods are applied, namely the Phillips-Perron (PP) test (1988) and the Bierens and Guo (1993) Cauchy test #3 are employed in this study. To mitigate possible finite-sample bias in the PP test, appropriate finite-sample p-values are simulated on the basis of 1000 replications of a Gaussian AR(1) process. The PP test employs a Newey-West type variance estimator of the long run variance of the OLS auxiliary regression, with the trancation lag $m = cn^r$, where $c = 5$, $r = 0.25$, n = number of observations.

Evidently, from Table 1, the results revels that simple-sum, divisia money and income can be modeled as I(1) processes. In such a case, the analysis proceed to test whether the monetary aggregates is pair-wise cointegrated with income. Table 2 presents the results of Johansen cointegration test. The order of the VAR model is chosen based on the Schwarz criteria. Among the four different money measures, both the maximum eigenvalue and trace statistics suggest that there is long run relationship exists between nominal income and Divisia M1.

Table 1: Results of Nonparametric Unit Root Test

	Level		First Differences	
	PP[1/]	BG[2/]	PP	BG
SM1	-0.47	67.1673**	-76.95*	0.1935
	[0.971]	[0.00948]	[0.0620]	[0.87829]
DM1	-1.06	76.3363**	-65.94*	0.409
	[0.965]	[0.00834]	[0.0870]	[0.75283]
SM2	-5.07	145.3522**	-60.81**	0.6399
	[0.789]	[0.00438]	[0.0480]	[0.63761]
DM2	-1.94	207.7608**	-54.69*	0.2141
	[0.841]	[0.00306]	[0.0860]	[0.86575]
GDP	-0.47	167.2664**	-11.85	0.3407
	[0.971]	[0.00381]	[0.2320]	[0.91419]

[1/] Phillipns Perron (1988) test.
[2/] Bierens and Gou (1993) test.
[3/] Simulated p-values for the PP test, in parentheses.

Table 2: Johansen Cointegration Test

	Lag[1]	Hypothesis	Max	Trace	H_0: $\beta' = (1\text{ -}1)$[2]
SM1	2	$r = 0/ r \leq 1$	10.0	13.8	-
		$r = 1/r = 2$	3.80	3.80	
DM1	2	$r = 0/ r \leq 1$	21.1*	22.7*	(1 -0.9498)
		$r = 1/ r = 2$	1.60	1.60	3.98*
SM2	2	$r = 0/ r \leq 1$	9.00	10.8	-
		$r = 1/ r = 2$	1.70	1.70	
DM2	2	$r = 0/ r \leq 1$	6.40	7.10	-
		$r = 1/ r = 2$	0.80	0.80	

[1] lag order selected using Schwarz criteria.
[2] LR tests for linear over identifying restrictions

To ensure that the results of Johansen approach are robust to the data-generating process, the Bieren's (1997c) nonparametric cointegrated test is adopted. As reported in Table 3, the lambda min and the $g_m(r_0)$ detected that long run relationship exists between the nominal income and the four types of money measurements and the cointegrating null $[1 -1]$ cannot be rejected.

Table 3: Bierens Cointegration Test Results

	Hypothesis	λ min	Hypothesis	$g_m(r_0)$	H_0: $\beta' = (1\text{ -}1)$[2]
SM1	$r = 0$	0.0087*	$r_0=0$	4.85E+02	(1 -0.9153)
	$r = 1$	0.4266	$r_0=1$	**3.43E+01**[3]	1.02
			$r_0=2$	1.89E+04	
DM1	$r = 0$	0.00138*	$r_0=0$	3.55E+03	(1 -0.5720)
	$r = 1$	0.20576	$r_0=1$	**2.01E+01**	1.15
			$r_0=2$	2.58E+03	
SM2	$r = 0$	0.001*	$r_0=0$	1.48E+04	(1 -0.3306)
	$r = 1$	0.1483	$r_0=1$	**9.30E+00**	1.19
			$r_0=2$	6.19E+02	
DM2	$r = 0$	0.0015*	$r_0=0$	9.16E+03	(1 –0.2009)
	$r = 1$	0.1003	$r_0=1$	**3.28E+01**	1.21
			$r_0=2$	9.99E+02	

[1] Lambda-min test statistic; m are chosen based on the optimal values tabulated in Bierens (1997c).

[2] Trace test for linear resections, m = 2n with the n the dimension of the system.

[3] Estimated number of cointegrating vectors is: $\hat{r} = \arg\min_{r0 \leq 2} g_m(r_0), m = 2$. Bold indicates minimum value of statistic.

In principle, the Bierens method is in the same spirit with the Johansen procedure. Based on the Monte Carlo simulations using a linear ECM, Bierens demonstrated that similar results can be obtained from both procedures. The failure of Johansen cointegration test in detecting the long run equilibrium relationship between the money and income reflect the inability of the standard linear cointegration framework in capturing the nonlinearity of the adjustment process, which assume to be constant over time.

CONCLUSION

The recent studies have questioned the policy role of monetary aggregates. A key issue is that whether there remain any significant evidence of stable long run relationship linking monetary aggregate and the nominal economic activity. This study is an attempt to detect the presence of long run money-income relationship using two different approaches, which are the parametric and nonparametric procedures. To this end, the widely-use Johansen (1988, 1991) cointegration test and the Bierens (1997c) nonparametric cointegration tests are employed. All cointegration analysis are tested between four aggregate definitions – simple-sum M1, M2 and divisia M1 and M2 with the nominal income.

Evidently, the empirical results indicated that there exists long run relationship between money (various defined) and income. In particularly, while the standard Johansen Cointegration test reveals that most of the monetary aggregate measures are not cointegrated with the nominal income, clear evidence of long run cointegration are offered by the Bierens nonparametric approach, which contrast sharply with a number of existing evidence obtained from standard cointegration tests. The empirical findings suggest that the potential policy role of monetary aggregate cannot be ruled out.

Indeed, as Breitung (2002) pointed out, under certain situations, the nonparametric approach may be attractive. The nonparametric test is robust against deviations from the usual assumption of linear short run dynamics, since the short run component does not affect the asymptotic null distribution of the test statistic. Also, if a high augmented lag is needed or the results depend sensitively on the number of lags included in the regression, it may useful to apply nonparametric tests.

REFERENCES

Amato, Jeffrey D., and Thomas Laubach. (2000). The Role of Forecasts in Monetary Policy. Federal Reserve Bank of Kansas City, *Economic Review*. 85, 21-32.

Bank Negara Malaysia (1999). The Central Bank and the Financial System in Malaysia-A decade of Change.

Barnett, William A.(1980). Economic Monetary Aggregates: An Application of Aggregation and Index Number Theory. *Journal of Econometrics*, 14, 11-48.

Bernanke, B.S. and F.S. Mishkin (1992). Central Bank Behavior and the Strategy of Monetary Policy: Observations from Six Industrialized Countries, In. O. Balnchard and Fisher, S. (eds.), NBER Macroeconomics Annual, 183-238. Cambridge: MIT press.

Bierens, H. J. (1997a). Testing the Unit Root with Drift Hypothesis Against Nonlinear Trend Stationary, With An Application to the US Price Level and Interest Rate, *Journal of Econometrics,* 81,29-64.

Bierens, H. J. (1997b). Cointegration Analysis, in: .Heij, H. Schumacher, B.Hanzon, and C. Praagman (eds), S*ystem Dynamics in Economic and Financial Models*. New York: John Wiley.

Bierens, H.J. (1993). Tetsing Stationarity and Trend Stationarity Against the Unit Root Hypothesis. *Econometric Review*, 12, 1–32.

Bierens, H.J. (1997c). Nonparametric Cointegration Analysis, *Journal of Econometrics*, 77, 379-404.

Breitung, J. (2002). Nonparametric Tests for Unit Roots and Cointegration. *Journal of Econometrics*, 108, 343-363.

Davis, M. and Tanner, E. (1997). Money and Economic Activity Revisited. *Journal of International Money and Finance,* 16(6), 955-968.

Diewert, W. Erwin.(1976). Exact and Superlative Index Number. *Journal of Econometrics*, 4, 115-146.

Feldstein, M., Stock, J.H. (1994). The Use of A Monetary Aggregate to Target Nominal GDP. In: Mankiw, N.G. (ed.), *Monetary policy, Studies in Business Cycles*. Chicago: University of Chicago Press, 7-62.

Fleissig, A. and Serletis, A (1999). Semi-Nonparametric Estimates of Substitution for Canadian Monetary Asset, Mimeo, The University of Calgary.

Freidman, B.M., and K.N. Kutter. (1992). Money, Income, Prices, Interest Rates. *American Economic Review*, 82, 472 – 492.

Friedman, B.M. (1996). The Rise and Fall of Money Growth Targets as Guidelines for U.S. Monetary Policy. NBER working Paper 5465.

Gandolfo, G. (1981). Quantitative Analysis and Econometric Estimation of Continuous Time Dynamic Models. Amsterdam: North-Holland.

Habibullah, M.S. (1998). Divisia Money and Income in Indonesia: Some Results From Error-Correction Models, 1981:1-1994:4.*Applied Economics Letters*, 5, 387-391.

Habibullah, M.S. (1999). *Divisia Monetary aggregates and economic activities in Asian developing economies*. England: Ashgate Publishing Ltd, 97-98

Hall, S.G., Hendry, S.G.B. and J. Wilcox (1990). The long run determination of the UK monetary aggregates, in S.G.B. Hendry and K.D. Patterson (eds.), *Economic Modelling at the Bank of England*, London: Chapman and Hall.

Hendry, D.F. and N.R. Ericsson (1991). Modeling the Demand for Narrow Money in the United Kingdom and the United States. *European Economic Review*, 35, 833-881.

Hendry, D.F. and N.R. Ericsson (1993). An Econometric Analysis of UK Money Demand in Monetary Trends in the United Stated and the United Kingdom by Milton Friedman and Anna J. Schwartz. *American Economic Review*, 81 (1), 8-38.

Johansen, S. (1988). Statistical Analysis of Cointegration Vectors. *Journal of Economic Dynamics and Control*, June-September, 231-254.

Johansen, S. (1991). Estimation and Hypothesis Testing of Cointegrating Vectors in Gaussian Vector Autoregressive Models. *Econometrica*, November. 1551-1580.

McDougall, R.S. (1994). The Stability of Velocity: a Test for Seasonal Cointegration. *Applied Economic Letters*, 1, 152-157.

Mishkin, F.S. (1999). International Experiences with Different Monetary Regimes, NBER working Paper 7044.

Phillips, P.C.B. and Perron, P. (1988). Testing for a Unit Root in Time Series Regression. *Biometrika*, 75, 335-346.

Svensson, Lars E.O. (1999). How Should Monetary Policy Be Conducted in and Era of Price Stability? In Federal Reserve Bank of Kansas City, *New Challenges for monetary policy*. 195-260.

Financial Development and Economic Growth:
Evidence from Malaysia

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ABSTRACT

This study attempts to examine the relationship between economic growth and the growth of financial development in Malaysia for the period of 1970-2003 by using Engle-Granger Procedure and Granger Causality Test. The empirical results suggested that a long-run relationship exist for economic growth and financial growth. A unidirectional causality from economic growth to the growth of financial development is found. This implies that the past information of financial development could not be used to predict the future movement of real economic growth.

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INTRODUCTION

The role of financial sector development in the growth process has received considerable attention in the economic literature in the last few decades. Numerous studies have attempted to establish the relationship between financial development and growth and the channels of transmission through which financial sector affects economic growth. Many economists hold the view that financial development is crucial in achieving a higher rate of economic growth. The general idea was that financial development might affect economic growth through its main functions of mobilizing domestic savings and allocation of capital. Since a developed financial system implies that the transaction, information and monitoring costs are reduced, it should therefore efficiently allocate resources - savings to productive economic activity and also increase capital formation, which in turn induces growth. In other words, a country with a better-developed financial system grows faster than those countries with less developed financial system.

It is evidence that more developed countries have more developed financial markets whereas in developing economies the financial system is among the most heavily regulated sectors of the economy. Government restrictions on the banking system like the imposition of interest rate ceilings, directed allocation of credits and control on the inflows of foreign capital (financial repression) hinder financial development and thus reduce growth rate. However, in the past decade there has been a dramatic reform of financial sectors in many developing countries. It is believed that liberalization and policies to develop the financial sector would be expected to stimulate economic growth.

Financial development means an improvement in quantity, quality, and efficiency of financial intermediary services (Lin Liu, 2003)[1]. An efficient system of payment is necessary condition for growth as it reduced transaction and information costs. The existence of an efficient intermediation system leads to a better mobilization of available savings and efficient allocation of resources to higher return investment opportunities by making the agglomeration of existing financial resources in the economy easier. Financial intermediaries can provide savers with higher return investments and also enables them to diversify risks associated with those investments. Reorientation of savings from real assets investment with low returns to high-expected return financial assets and to productive investments may encourage capital formation and hence stimulate growth. Therefore, services provided by financial intermediaries could have positive net effect on the economy's long run growth rate and this theoretical relationship between financial development and growth has been recently analyzed using endogenous growth model.

Based on the paramount importance of financial development for economic growth, many empirical researches were undertaken to investigate the relationship as well as the issue of causality either at firm, industry, country-case or cross-country level. The conclusions reached suggest that financial intermediation has a positive effect on economic

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[1] Broadly defined, financial development includes financial intermediary development and stock market development.

growth. However, the direction of causation is unclear. In some cases, the causality is found to be one way, some bi-directional, while in some other cases the relationship reflects reverse causality. Evidence on causality is important for policymakers because it has different implication for development policy whether policies should be aimed to financial sector liberalization or to enhance growth (Calderon & Liu, 2003).

Before the onset of 1997 financial crises in the Southeast Asia, Malaysia has achieved a remarkable economic growth for many decades. Its GNP per capita rose from only $390 in 1970 to $4 370 in 1996 as a result of higher growth rates. Along with this rapid growth, the financial sector has experienced rapid structural transformation too. Despite of its spectacular growth performance, Malaysia was badly hit from the financial crisis and this further underline the importance of a well-functioning financial sector to the economy. With regards to this scenario, one pertinent question might be raised: is there any link between financial system and the macroeconomic performance of an economy, and if any how does financial sector affect economic growth? In view of this, the paper attempts to analyze whether there is any evidence for financial development promotes economic growth of the Malaysian economy or vice versa. Following the introduction, part 2 briefly reviews some of the existing literature on financial development and economic growth. Part 3 discuss the methodology and the data used, and the empirical results will be discussed in part 4. Part 5 provides a summary and concluding remark.

THEORETICAL AND EMPIRICAL LITERATURE

The theoretical and empirical literature on the relationship between financial development and economic growth has grown extensively ever since the writings of Schumpeter (1912), Patrick (1966), and more recently McKinnon (1973), Shaw (1973), and King and Levine (1993) among others. Theoretically, the proposition is that development of the financial system is an important input for achieving and sustaining economic growth. Schumpeter argues that services provided by financial intermediary encourage technological innovation by identifying and funding entrepreneurs to foster economic development. McKinnon and Shaw contend that financial development affects economic growth through interest rate. Higher real interest rate resulting from financial liberalization would raise savings and will lead to increased investment and economic growth. He argued that government intervention on the development of the financial system such as interest rate ceilings would discourage savings, which then reduce the availability of loanable funds for investment. This in turn will lower the rate of economic growth.

Patrick (1966) viewed the role of financial development to economic growth as 'supply-leading and demand-following'. The 'supply-leading' role of financial development views postulates that financial sector leads to economic growth in such a way that the existence of financial intermediaries and markets increases the supply of financial services, and hence economic growth. The 'demand-following' views posit that development of the financial sector is facilitated by growth in the real sector. The need for financial services and institutions arise as the economy grows. He also recognized a two-way relationship, which depends on the stage of economic development. In the early stages of development, financial sector development is consistent with the 'supply-leading' view and during the advanced stages of development it is consistent with the 'demand-following' view. Levine (1997 : 689) explained the role of financial system in economic growth based on functional approach that focus on the ties between growth and the quality of the functions provided by the financial system. He categorizes the functions of financial system into five basic tasks – facilitate trading, hedging, diversifying, and pooling risk; allocate resources; monitor managers and exert corporate control; mobilize savings; and facilitate the exchange of goods and services. He suggests a positive first order relationship between financial development and economic growth.

Some economists demonstrate theoretical discussions on the potential role of financial sector development on economic growth within the framework of endogenous growth model. These include studies by Bencivenca and Smith (1991), Greenwood and Jovanovic (1990), King and Levine (1993), and De Gregorio and Guidotti (1995). According to Bencivenca and Smith (1991), individuals are uncertain about their future liquidity needs, and they choose to invest in liquid assets with low productivity and forgoing the riskier assets with high productivity but illiquid. With the presence of financial intermediaries savings is channeled to high productive investment and at the same time reduce the risk associated with their liquidity needs. Hence, growth will be increased. Greenwood and Jovanovic (1990) examines the relation between financial structure and economic development and found that there exists a positive effect of financial structure on growth. The reason for this is that financial intermediation allows efficient investment undertakings with higher returns and capital accumulation as a result of information about the nature of shocks on investments. King and Levine (1993) employ an endogenous growth model in which the financial intermediaries obtain information about the quality of individual projects that is not readily available to private

investors and public markets. This information advantage enables financial intermediaries to fund innovative products and productive processes, thereby inducing economic growth.

On the empirical side, a number of recent studies have tried to assess the importance of financial development to economic growth. Some of the studies try to identify how does financial sector affects economic growth; where as other studies investigate the correlation and evaluate the strength of the relationship between financial development and economic growth. Several measures or indicators for the development of the financial system have been constructed to examine the channels through which financial development is linked to economic growth. However, the diversifying services provided as well as various agents and institutions involved in financial intermediation activities make it difficult to have good measures of financial development.

One of the most influential empirical studies is by King and Levine (1993) who employs endogenous growth model that covers a cross section data of 80 countries over the period of 1960-1989. They found a strong positive link between financial development and growth. In a more recent study, Levine (1997) suggests a positive, first-order relationship between financial development and economic growth. Four measures of the level of financial development are considered which are liquid liabilities of banks and non-bank institutions as a share of GDP, the ratio of bank credit to the sum of bank and central bank credit, the ratio of private credit to domestic credit, and the ratio of private credit to GDP. In addition, King and Levine study also shows that financial development is robustly correlated with rate of growth, capital accumulation and economic efficiency, indicating a causal relationship from financial sector development to economic growth.

The direction of causation between the level of financial development and economic growth was also empirically examined and reported by Jung (1986), Demetriades and Hussein (1996), Rajan & Zingales (1998), and Calderon and Liu (2003) among others. The evidence suggests a two-way relationship, one-way relationship as well as reverse causality. Using post-war data for 56 selected countries; Jung (1986) used two proxies to financial development, which are the ratio of currency to M1 and the ratio of M2 to nominal GDP. He found bi-directional causality between financial and real variable, indicating a causal direction from financial to real sector for the developing countries but for developed countries the causality runs from real sector to financial sector. Rajan & Zingales (1998) present industry level evidence that link financial development and economic growth through the supply of external finance to firms. They found that industrial sectors that are relatively more in need of external finance grow faster in countries with more developed intermediaries and stock markets than in countries with less developed financial markets. The result also shows that financial development lowers the cost of external financing and therefore induces economic growth, suggesting causality from financial development to economic growth.

Calderon and Liu (2003) employs Geweke decomposition test on pooled data of 109 countries to explore the direction of causality between financial development and economic growth. The study shows evidence that financial development enhances economic growth and the existence of bi-directional causality. Evidence from study conducted by Demetriades & Hussein (1996) for 16 countries provides less support on the role of financial sector in the process of economic development. They found that the causality pattern varied across countries. The same result was also found in De Gregorio and Guidotti (1995) and Sinha & Macri (2001). On the contrary, a conclusion reached by Ram (1999) based on individual-country analysis does not support the view that financial development promotes economic growth, and further, estimates from basic multiple regression growth model also do not indicate a positive association between financial development and growth. In a country-case study, better functioning financial systems support faster growth. This result was also found by Khan and Senhadji (2000), and Fase and Abma (2003).

METHODOLOGY AND DATA

This paper considers individual country regression analysis rather than cross-country estimates. The Engle-Granger Procedure and Granger Causality methods are used to study the relationship between economic growth (real gross domestic product, RGDP) and financial development growth (FD). Before any causality test can be performed, the integration orders of time series should be verified. This is because the test procedure requires that the time series used for causality should be stationary. The first step is to pretest the variables (RGDP and FD) for their order of integration by differencing each series successively until a stationary series is obtained. The tests for this are the Augmented Dickey Fuller (ADF) unit root test:

$$\Delta RGDP = \mu + \gamma RGDP_{t-1} + \delta_1 \Delta RGDP_{t-1} + \delta_2 \Delta RGDP_{t-2} + \ldots + \delta_p \Delta RGDP_{t-p} + E_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

If the results of step 1 indicate that each pair of series is integrated at the same order, the next step is to estimate the long run equilibrium relationship in the form:

$$RGDP_t = \beta o + \lambda FD_t + E_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

In order to determine which pair of series is actually cointegrated (or have long run relationship), denote the residual sequence (i.e. L) from equation (2). Thus, {L} is the series of the estimated residuals of the long run relationship. If these deviations from long run equilibrium are found to be stationary, the RGDP and FD sequences are co integrated. A Dickey-Fuller test can be performed on these residuals to determine their order of integration. Consider the auto regression of the residuals below:

$$\Delta L_t = \Phi^* L_{t-1} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.\dots\dots\dots\dots(3)$$

Since the {L} sequence is a residual from a regression equation, there is no need to include either an intercept term or a trend in its augmented version. The reason to apply this is because the expected value of the series is equal to zero (since they are the error terms), and the intercept is also equal to zero.

The third step is estimating the Error-Correction Model (ECM). The ECM developed by Engle-Granger is a means of reconciling the short run behaviour of an economic variable with the long run behaviour (Gujarati, 1995). In other words, this model tries to determine the size and direction of the adjustment of the cointegrated variable(s) that returns to the long run equilibrium relationship after a temporary movement away from it. If the two variables are cointegrated, one can establish their relationship with an ECM by the two-stage process. In the first stage, the long run parameters are estimated. This is achieved simply by estimating the cointegrating regression:

$$RGDP = \beta o + \beta_1 FD_t + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots...(4)$$

This can be done by OLS (ordinary least square) regression. β_1 is called the cointegrating coefficient. It shows how much and in what direction the growth of financial development needs to move in order to the influence of the growth of real GDP.

In the second stage, the short run relationship is investigated by estimating the following equation using the error term, e_t from equation (4).

$$\Delta RGDP = \sum_{i=1}^{n} \delta i \Delta RGDP_{t-i} + \sum_{i=1}^{m} \gamma j \Delta FDt\text{-}j - \lambda_1 e_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(5)$$

and

$$\Delta FD = \sum_{i=1}^{n} \delta i \Delta RGDP_{t-i} + \sum_{i=1}^{m} \gamma j \Delta FDt\text{-}j - \lambda_2 e_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.(6)$$

RGDPt and FD are the natural logarithms of real GDP and financial development. n and m are the number of lags and e_{t-1} is the lagged value of the error-correction, which is derived from the cointegrating equation in the first stage. In testing these equations, the error correction term must be included to avoid misspecification. The omission of one lag at the error-correction term (ECT) is necessary because the effects of additional lagged ECTs are already captured in the distributed lags of the first differences of RGDPt, and FDt (Engle and Granger, 1987). Parameters λi are called the speed of adjustment coefficient. For instance, parameter λ_2 corresponds to the speed of adjustment of FD to the long run equilibrium in the next period after a temporary deviation from it in the current period (Carlos, 1997).

It should be noted that the precise lags (n,m) on the differenced terms in the above equation are not specified by Granger Representation Theorem. A possible approach to determine the optimal lags is to use the Akaike Information Criterion (AIC). The optimal lags are chose base on the minimum value of AIC. Finally, the optimal lags from the ECM are fitted into the Granger Causality equations.

DATA

This study uses secondary data, consisting of annual data for Real Gross Domestic Product, RGDP; and financial development, FD. Each of the data is transformed into the logaritma form before proceeding any tests.The study period spans from 1970 to 2003. The data is obtained from International Financial Statistic CD-ROM. Real Gross Domestic Product is used as proxies for economic growth. For financial development measure, we followed the previous studies (Gregorio & Guidotti (1995) and Sinha & Macri, (2001)) one. In existing literature, many proxy variables have been used to represent financial development such as (i) the ratio of monetary agregates (M1, M2 and M30 to GDP; (ii) the ratio of domestic credit to the private sector to GDP; (iii) the ratio of liquid liabilities to GDP. In this study, we choose the ratio of domestic credit to the private sector to GDP as a proxy of financial development. The ratio of monetary agreggates to GDP is not been chosen because according to Khan & Senhadji (2000), M1, M2 or M3 are poor proxies for financial development. They are more related to the ability of the financial system to provide transaction services than to the ability to channel funds from savers to borrowers. By excluding credit to the public sector, the ratio of domestic credit to the private sector to GDP measures more accurately the role of financial intermediaries in channeling funds to the private sector. However, private credit is only a broader measure of banking sector development whereas the definition of the financial development should be included the development in money market and capital market. We have to exclude the capital market data because of unavailability of complete data.

ANALYSIS OF EMPIRICAL RESULTS

Table 1 shows the augmented Dickey-Fuller unit root tests results. For the level of the series, none rejects the hypothesis of nonstationarity at 5 per cent significance level. After the first differencing, we are able to reject the null hypothesis of a unit root at 5 per cent significance level.

Table 1: Unit Root Tests Results

Variables	Constant Without Trend	Constant With Trend
	Level	
RGDP	-1.2049(2)	-2.2359(1)
FD	-1.7070(1)	-2.0389(1)
	First Difference	
RGDP	-4.0656(1)*	-4.1905(1) *
FD	-3.9583(1) *	-4.1223(1) *

Note: RGDP is real GDP and FD refers as financial development. The critical values for rejection of the ADF tests are –2.93 and –3.50 at a significance level of 5%, where a constant without trend and a constant with a time trend are included in the equation. The asterisks (*) indicate the level of significance at a 5%. The number in each parenthesis indicates the optimal lag length used in the test. The optimal lag length is determined based on Akaike Information Criterion (AIC).

Table 2: Empirical Results of Cointegration Test

Residual	Dickey-Fuller Test
RGDP & FD	-1.9810 (0)*

Note: The asterisk denotes significance at the 0.05 level where the critical value is –1.95.

Table 2 presents the result of cointegration analysis for RGDP & FD. The residual sequence for RGDP & FD is stationary at 5% significance level. This means economic growth and financial development have long run relationship. In other words, we say the series is cointegrated.

The two-stage procedure is quite straightforward. First the long-run effects are estimated as below:

$$\hat{RGDP} = 4.2725 + 1.0821 \, FD \quad\dotfill(7)$$
$$(110.3147) \quad (21.5709)^*$$

Note: Equation (7) represents the long-run effect for real GDP and financial development (FD). The values in the parenthesis are the t-statistics. The asterisk (*) denotes significant at the 0.05 per cent level of significance.

From the regression above, the signs on the estimated coefficient indicates positive correlation between the economic growth (real GDP) and the growth of financial development (FD) in the long run. This correlation may not reflect a causal relationship between real GDP and FD. It means while other things being equal, 1 per cent change in the growth of financial development will cause economic growth to increase to 1.0821 per cent.
Table 3 reports the optimal lags for error-correction models. The lags range from 1 to 3.

Table 3: Error Correction Model

Regression	Dependent Variable	Speed of Adjustment Coefficients	n,m	AIC
RGDP & FD	RGDP	0.0004 (0.9927)	3,1	-3.3402
	FD	0.2037 (0.0770)*	1,1	-1.7954

Note: The number in each parenthesis indicates the p-value of each adjustment coefficient. The asterisk denotes significant at 0.10 per cent level.

The important information we take from the error correction model is the speed of adjustment parameters. From table 3, we observe that in the short run just one of these parameters is significant. It means that after a disequilibrium between two variables, (namely economic growth (Real GDP) and growth of financial development (FD)) just the growth financial development converges again to the long run equilibrium. The value of this coefficient is 0.2037 which means that 20.37 per cent of the adjustment is done within the first year after the disequilibrium.

Finally, table 4 presents the F-statistics for the tests of the causal link between Real GDP and FD. Based on this empirical result, we can conclude that a unidirectional causality from real GDP to FD is found. Real GDP leads FD by one year. This means FD can be predicted with better accuracy by using past values of real GDP, with the assumption that other information being identical.

Table 4: Granger Causality Test Results

Hypothesis	F-value	p-value	Decision ($\alpha = .05$)	Direction of causality
RGDP & FD				
FD→RGDP	0.71435	0.40469	Do not reject Ho	No causality
RGDP→FD	5.20033	0.02986	Reject Ho	Unidirectional causality

It is clear that the growth of financial development does not predict the economic growth for Malaysia case. The conclusion is not consistent with Choong, et. al (2003) and Romer (1990), but the significance and positive relationship between real GDP and financial development result is similar as Sinha and Macri (2001). The empirical results that obtained from this study also support the growth-led finance hypothesis that state a high economic growth may create demand for certain financial instruments and arrangements and the financial markets are effectively response to these demands and changes.

DISCUSSION AND CONCLUSION

Obviously, the financial development could not be the information provider for the subsequent movement in economic growth. It may indicate that financial development is not a leading indicator. This may be due to the following reasons. Malaysia is a small country and its economy has been very open since independence. Hence, other forces such as oil prices, world economic and political conditions are much more influential and have significant impact on Malaysian economic growth than financial development. This implies that the financial development data may not predict the future movement of economic growth especially in the open yet small country such as Malaysia significantly.

Meanwhile, the financial development in Malaysia remains at the emerging level if we compared with developed countries. For the past decades, the main financial development has been focused on banking sector rather than capital market. Until 1990s then only more attention has been devote on the development of capital market and restructuring the banking system. The less developed capital market and solid banking system may cause financial development data no longer a good predictor for Malaysian economic growth. Besides, the lag effect of financial impact may cause it failed to be a good predictor for future movement of economic growth.

Other factors such as the type and time period of data and methodology used in this study may also reduce the potential usefulness of financial development as information provider for future movement of economic growth. For example financial development should consist the data of three areas, namely banking and non-banking sector, stock and bond market. Yet, the data used as the proxy for financial development in this study comprised only the domestic credit data. It has excluded the data of stock capitalization and bond market because of unavailability of such data for the sufficient study period. The usage of this narrow definition or scope of financial development may lead to the failure of financial development as a precise predictor for economic growth.

The empirical finding of the study indicates that the past information on financial development failed to predict the future movement of economic growth. This would suggest that to increase the ability and reliability of financial development data, much effort should be done on consolidating every aspect of both money and capital markets in Malaysia. These include develop the indicators that able to assess the development of financial sector in Malaysia (such as bank quality service index and the efficiency of capital market) and improve the current financial statistics data. If necessary, the innovation in financial sector should be taken into account while developing the new indicators or improve the current statistics data.

If financial development data failed to be the predictor for economic growth, then the Central Bank should monitor closely the movement of the international sectors' to reduce the contagion effect that will eventually affect our economic growth and economic forecasting. To enhance the reliability of financial data, sound financial practices and market should be created by Central Bank. To have sound financial market, we should not rely heavily on foreigners. In contrast, we should encourage more domestic players to participate in financial markets (either act as excess or deficit units). This can be done by educating the locals and disseminating more information throughout the country.

To conclude, this study attempts to examine the relationship between economic growth and the growth of financial development in Malaysia for the period of 1970-2003 by using Engle-Granger Procedure and Granger Causality Test. The empirical results suggested that a long-run relationship exist for economic growth and financial growth. A unidirectional causality from economic growth to the growth of financial development is found. This implies that the past information of financial development could not used to predict the future movement of real economic growth.

The relationship between economic growth and the growth of financial development is a long lasting research topic. There are on going efforts, both theoretical and empirical, to investigate the controversy of thought among the economists. It would be interesting if future researchers could include more factors that influence economic growth and expand the scope of study to other countries.

REFERENCES

Ansari, M.I. (2002). Impact of financial development, money, and public spending on Malaysian national income: an econometric study. *Journal of Asian Economics*. 13: 72-93.

Beck, T., Demirguc-Kunt, A. & Levine, R. (2000). A New Database on the Structure and Development of the Financial Sector. *The World Bank Economic Review*, September. 14 (3): 597 – 605.

Benhabib, J. and Spiegel, M. (2000). The Role of Financial Development in Growth and Investment. *Journal of Economic Growth* 5: 341-360.

Calderon, C. and Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*. 72: 321-334.

Choong, C.K., Yusop, Z., Law, S.H. and Liew, K.s. (2003). Financial Development and Economic Growth in Malaysia: The Stock Market Perspective. at http://netec.mcc.ac.uk/WoPec/data/papers/wpawupma0307010.html.

Demetriades, P.O. and Hussein, K. A. (1996). Does Financial Development Cause Economic Growth? Time-series Evidence from 16 Countries. *Journal of Development Economics*. 51: 387-411.

Demirguc-Kunt, Asli and Enrica Detragiache (1998). Financial Liberalization and Financial Fragility. *IMF Working Paper*, No. 98/83 June.

Fase, M..M.G. and Abma, R.C.N. (2003). Financial environment and economic growth in selected Asian countries. *Journal of Asian Economics*. 14: 11-21.

Khan, M.S. and Senhadji, A.. S. (2000). Financial Development and Economic Growth: An Overview. *IMF Working Paper*, 209.

King, R.G. and Levine, R. (1993). Finance and Growth: Schumpeter Might Be Right. *Quarterly Journal of Economics*. 108: 717-38.

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature*. 35: 688-726.

Levine, R. Loayza, N. and Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics*. 46 (1): 31-77.

Odedokun, M.O. (1998). Financial Intermediation and Economic Growth in Developing Countries. *Journal of economic Studies*. 25 (3): 203-224.

Rajan, R. and Zingales Luigi (1998). Financial Dependence and Growth. *American Economic Review* 88:559 – 586.

Ram, R. (1999). Financial Development and Economic Growth: Additional Evidence. *The Journal of Development Studies*.April, 35 (4): 164 – 174.

Romer, P.M. (1990). Endogenous Technological Change, *Journal of Political Economy*. 98: 71-102.

Sinha, D. and Macri, J. (2001). Financial Development and Economic Growth: The Case of Eight Asian Countries. *Economia Internazionale* 55: 219-237.

Tseng, Wanda, and Robert Corker (1991). Financial Liberalization, Money Demand, and Monetary Policy in Asian Countries, *IMF Occasional Paper*. No. 84, March.

APPENDICES

Dependent Variable: LOG(RGDP)
Method: Least Squares
Date: 10/11/04   Time: 14:15
Sample: 1970 2003
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.272571	0.038731	110.3147	0.0000
LOG(FD)	1.082141	0.050167	21.57079	0.0000
R-squared	0.935652	Mean dependent var		3.719105
Adjusted R-squared	0.933642	S.D. dependent var		0.656717
S.E. of regression	0.169171	Akaike info criterion		-0.658789
Sum squared resid	0.915804	Schwarz criterion		-0.569003
Log likelihood	13.19941	F-statistic		465.2990
Durbin-Watson stat	0.483039	Prob(F-statistic)		0.000000

ECM, n=3, m=1
 Dependent Variable: DLOG(RGDP)
 Method: Least Squares
 Date: 09/09/04   Time: 18:32
 Sample(adjusted): 1974 2003
 Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(RGDP(-3))	0.268630	0.217098	1.237365	0.2270
DLOG(FD(-1))	-0.080455	0.086113	-0.934294	0.3587
RESD(-1)	0.000455	0.048975	0.009290	0.9927
C	0.047712	0.015988	2.984180	0.0061
R-squared	0.069344	Mean dependent var		0.061863
Adjusted R-squared	-0.038040	S.D. dependent var		0.042024
S.E. of regression	0.042816	Akaike info criterion		-3.340260
Sum squared resid	0.047663	Schwarz criterion		-3.153434
Log likelihood	54.10390	F-statistic		0.645759
Durbin-Watson stat	1.824635	Prob(F-statistic)		0.592643

ECM, dependent var: FD,n=1. m=1
 Dependent Variable: DLOG(FD)
 Method: Least Squares
 Date: 09/09/04   Time: 18:37
 Sample(adjusted): 1972 2003
 Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(RGDP(-1))	0.659140	0.425627	1.548632	0.1327
DLOG(FD(-1))	0.173572	0.171448	1.012389	0.3200
RESD(-1)	0.203786	0.111006	1.835815	0.0770
C	0.004461	0.033003	0.135161	0.8935
R-squared	0.241085	Mean dependent var		0.054778
Adjusted R-squared	0.159772	S.D. dependent var		0.101482
S.E. of regression	0.093022	Akaike info criterion		-1.795485
Sum squared resid	0.242289	Schwarz criterion		-1.612268
Log likelihood	32.72775	F-statistic		2.964921
Durbin-Watson stat	2.104090	Prob(F-statistic)		0.049062

Granger,lag1
 Pairwise Granger Causality Tests
 Date: 09/09/04   Time: 19:11
 Sample: 1970 2003
 Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
LOG(FD) does not Granger Cause LOG(RGDP)	33	0.71435	0.40469
LOG(RGDP) does not Granger Cause LOG(FD)		5.20033	0.02986

Money, Price and Causality in Malaysia: A Revisit

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ASTRACT

This study aims to re-investigate the causal relationships between money and price level in Malaysia using Modified Wald (MWALD) test developed in Toda and Yamamoto (1995). Quarterly data for the period 1970:1-1998:4 were used in analysis. The results of MWALD tests reveal a uni-directional causality that is from money to price level. However, no reversed causality found from price level to money. This findings are different from Pinga and Nelson (2001) where no causality between these two variables. Furthermore, this study provides empirical evidence to support monetarist view. Finally, several policy implications have been discussed in this study.

INTRODUCTION

The relationship between money supply and aggregate prices has been a long debated, particularly the causal relationship among the variables. According to Pinga and Nelson (2001:1271), the direction of causality has long been a matter of controversy. The two theories obviously hold in this debate are first, the widely accepted Quantity Theory of Money (monetarist) argues that inflation is caused by exogenous changes in the money supply. Second, is a minority *structuralist* view, which holds that inflation, particularly in less-developing countries, develops from pressures arising in economic growth in economies with institutional rigidities (particularly in agriculture and international transactions). Thus, the monetary and fiscal authorities choose to expand the money supply, ratifying the inflationary pressures, rather than face unemployment or disruptions in consumption and investment. Underdeveloped financial markets and a weakly independent central bank can contribute to the likelihood of money supply growth. Under this view, money supply expansion is a consequence of, and therefore caused by structural inflation.

For a small open economy like Malaysia, Pinga and Nelson (2001) documented that no causal relationship between prices and money (both M1 and M2). The study estimated two-variable of VAR system for standard Granger causality procedure (Granger 1969) on monthly data by first differencing the natural logs of series. Another study was done by Tan and Baharumshah (1999) who employed the Johansen's multivariate cointegration analysis and vector error-correction modeling (VECM) approach investigated the dynamic causal chain among money (M1, M2 and M3), real output, interest rate and inflation in Malaysia. Their sample period covers the monthly data from 1975M1 to 1995:12. Due to limited data available for money variables, the sample period for M2 is from 1978M1 to 1995M12, and 1987M1-1995M12 for M3. The causality analysis (M2 and Price) based on VECM estimation is that price level does Granger cause M2 through short run channel (the estimated price coefficients of M2 equation are jointly significant). In addition, significant of the error correction term (define as long-run causality channel) of the M2 equation, indicated that real income, interest rate and price jointly cause M2 in long run. Real output, interest rate as well as M2 jointly causes price level through long run channel (Tan & Baharumshah 1999:112, Table 4). The author only cited the causality results of M2 and price as the present study aim to reexamine the causal relationship between M2 and price level. Unfortunately the exact causality between two variables, price and money either 'Price causes M2' or 'M2 causes Price' is unknown under the multivariate Vector Error Correction specification (more that two variables).

Thus, the major justifications of the present study are that, according to Shan and Pappas (2000:292) testing for Granger no-causality in multiple time series has been the subject of considerable recent research in the literature of econometrics. They argued that the traditional *F*-test in a regression context for determining whether some parameters of the model are jointly zero (like Standard Granger causality procedure) is not valid when the variables are integrated and the test statistic does not have a standard distribution. Furthermore, using first differencing series (as in Pinga & Nelson 2001) will cause bias results due to the loss of long-run information of the series. As stressed by Bahmani-Oskooee and Alse (1993: 536) in their study on investigation for the direction of causality among exports and output, "…*the presence of nonstationary tendencies that result in spurious regression result",* and "*The remedy of using rates of change of output and exports that is close to the concept of first differencing, which filters out low-frequency (long run) information*". As noted by Al-Yousif (1999: 68) *bivariate* models is potentially misspecified and may be flawed due to the omission-of-variable

phenomenon. As a result, one would be expect that both causality and cointegration tests would yield biased or mixed results. The present study considers the biases of using bivariate VAR specification as employed by Pinga and Nelson (2001) by employing the MWALD (Modified-Wald) approached by Toda and Yamamoto (1995) with trivariate specification.

The MWALD test is more appropriate to apply in the present study by estimating an 'augmented' VAR specification. This approach provides an ability to handle the problems of using nonstationary or cointegrated series in causality analysis. According to Zapata and Rambaldi (1997) both likelihood ratio tests (LR) and WALD tests are very sensitive to the specification of the short-run dynamics in Error Correction Models (ECMs) even in large samples. They noted that given the performance of the tests in larger samples of more than 50 observations, MWALD approach that developed by Toda and Yamamoto (1995) has much practical appeal because of its simplicity. Toda and Yamamoto (1995:227) proposes a simple way to overcome the problems in hypothesis testing when VAR processes may have some unit roots. They noted that this approach is applicable whether the VAR's may be stationary around a deterministic trend, integrated of an arbitrary order, or cointegrated of an arbitrary order. Consequently, one can test linear or nonlinear restrictions on the coefficients by estimating a level VAR and applying the Wald criterion, paying little attention to the integration and cointegration properties of the time series data in hand. The MWALD test is that, it has a limiting chi-squared distribution even if there is no cointegration or the stability and rank conditions are not satisfied '*so long as the order of integration of the process does not exceed the true lag length of the model*' (Toda & Yamamoto 1995:225).

Second, the present study focuses on M2 money supply, instead of others money variables, M1 and M3. The argument is that Malaysia monetary targeting started with M1, but more recently it has moved to broader monetary aggregates, which were less affected by interest rates movements. This means that M1 is inappropriate for profound policy implication. Moreover, the Bank Negara favored M3 as monetary target since 1984 (see Tan & Baharumshah, 1999). Tan and Baharumshah's (1999) study used the available M3 monthly data from 1987 to 1995 that covered nine years period. The available sample period for M3 started from 1987 found to be insufficient long to capture the inter-linkage between the variables, for example, the period 1987-1999 yielding 13 years. The justification is that, Toa and Zestos (1999: 121) believed that causality is a timely phenomenon, and the interaction of economic variables cannot work in short period of a few quarters. Hence, they used annual data in their causality analysis between export and growth. With the above concern, quarterly data are more reliable than monthly data due to its longer gestation transmission period. The available of M2 series covers the sample period from 1970Q1 to 1998Q4 (29 years, and data are obtained from *International Financial Statistics CD-ROM,* IMF) to be sufficient long to apply MWALD test for causality analysis compare to using M3 time series.

THE DATA

The paper utilized the quarterly data of period 1970Q1 to 1998Q4 that yielding 116 observations or covers 29 years. As follows Pinga and Nelson (2001), the money variable (M) is nominal broad money (in RM millions) that is money plus quasi-money). The price level variable (P) is Consumer Prices Index (100=1995). The Gross Domestic product (GDP) series was accounted into analysis by considering the bias of using bivariate specification among money and price variables. The income series find to be unavailable in quarterly basis, from *International Financial Statistics* as well as statistics reports from Bank Negara Malaysia. For instance, Mithani and Goh (1999) constructed quarterly GDP series (1970Q1-1994Q4) from annual data by estimating the components of GDP (annual basis) from a set of approximation bases (quarterly series). However, the issue is that measurement errors may be more serious when data used are constructed data. Therefore, the income variable (Y) is proxied by Industrial Production Index (100=1995). Ghirmay, Sharma, and Grabowski (1999: 217) noted that the appropriately of a variable could be serve as a proxy is done by calculating the correlation between the variables. The coefficient of correlation between the available Real Gross Domestic Product and Industrial Production Index for the available period 1988Q1 to 1997Q4 is 0.997, indicating the power of approximation is likely meaningful. All of the data are obtained directly from the *International Financial Statistics* of the International Monetary Fund. All data are that converted into natural logarithm form. As shown in Figure 1, both logarithms of money and income reveal an upward trend. No discernible trend is observed in the logarithms of price level series. Overall, no significant structural breaks are observed in the data series.
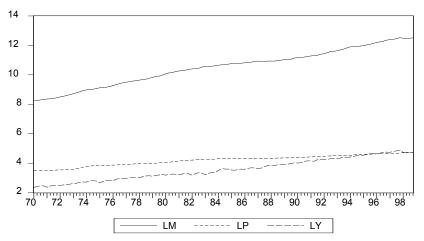
Figure 1: Plot of logarithm Series of Money (LM), Price (LP) and Income (LY)

Although the MWALD test (Toda & Yamamoto, 2000) does not require the knowledge of cointegration properties of the system, as follows Shan and Pappas (2000: 293), prior to employing for the Toda and Yamamoto's (1995) type of causality procedure, it is necessary to test the order of integration, I(d) for the series involved and establish that they are integrated of the same order. The Phillip-Perron (1988) unit root approach was used to identify the degree of integration of the series, I(d). The results of unit root test are presented in Table 1, and all the three series are integrated of order one, or I(1).

Table 1: Phillip-Perron Unit Root Test

Variables:		Level	First Difference
Ln M		-1.426 (4)	-7.933 (4)
Ln P		-1.561 (4)	-8.644 (4)
Ln Y		-3.407(4)	-11.468(4)
MacKinnon's (1991) critical Values:	1%	-4.040	-3.489
	5%	-3.449	-2.887
		(Trend and Constant)	(Constant only)

Note: the numbers in parentheses are the choice of truncation lag length used in the test.

THE METHOD AND RESULTS

Toda and Yamamoto (1995) proposed a modified WALD test for restrictions on the parameters of a VAR (k), or MMALD procedure, where k is the lag length in the VAR system. This test has an asymptotic Chi-squared distribution when a VAR ($k+d_{max}$) is estimated, where d_{max} refers to the maximum order of integration suspected to occur in the system, that is one in the present paper (all of the endogenous series are integrated of order one). The first step is to determinate an optimal lag length for 'augmented' VAR that is VAR ($k+d_{max}$). The optimal lag of VAR system is based on Enders (1995:313) by considering of using quarterly data, "…*using quarterly data, you might start with a lag length of 12 quarters based on the a priori notion that 3 years is sufficiently long to capture the system's dynamics…Now suppose you want to determine whether eight lags are appropriate. After all, restricting the model from 12 to eight lags would reduce the number of estimated parameters by 4n in each equation*". The lowest AIC and SC values are used to select the optimal lag length of VAR system starting with 12, than 8 and 4. The results indicated that the optimal VAR order for the system is four based on Akaike Information Criterion (AIC) and Schwartz Criteria (SC). Thus, the 'augmented' VAR order is VAR (5), that is VAR ($k+d_{max}$). The causality test is sensitive with lags length; thus, the VAR (12+1) and VAR (8+1) are investigated. The three-variable VAR(5) as in equation 1.

$$\begin{bmatrix} M_t \\ P_t \\ Y_t \end{bmatrix} = A_0 + A_1 \begin{bmatrix} M_{t-1} \\ P_{t-1} \\ Y_{t-1} \end{bmatrix} + A_2 \begin{bmatrix} M_{t-2} \\ P_{t-2} \\ Y_{t-2} \end{bmatrix} + A_3 \begin{bmatrix} M_{t-3} \\ P_{t-3} \\ Y_{t-3} \end{bmatrix} + A_4 \begin{bmatrix} M_{t-4} \\ P_{t-4} \\ Y_{t-4} \end{bmatrix} + A_5 \begin{bmatrix} M_{t-5} \\ P_{t-5} \\ Y_{t-5} \end{bmatrix} + \begin{bmatrix} e_M \\ e_P \\ e_Y \end{bmatrix} \quad (1)$$

where A_1 to A_5 are 3x3 matrices of coefficients with A_o an identity matrix. In order to investigate a causal relationship from Price (P) to M (Money) in VAR (5), testing the null of "price level (P) does no-cause money

(M)", and more formally $H_O : b_1 = b_2 = b_3 = b_4 = 0$ was established, where b_i are the coefficients of P_{t-i} in the first equation as in (1). For testing the hypothesis of "money (M) does no-cause price level (P)", or $H_O : b'_1 = b'_2 = b'_3 = b'_4 = 0$ is tested whereby, b'_i are the coefficients of M_{t-i} in the second equation of VAR (5).

The results are cited in Table 2. The null of "M does not cause P" is strongly rejected at 1 per cent level over the three difference lag-length specifications (4, 8 and 12 quarters). This means that money (M) does Granger cause aggregate price (P) in Malaysia, and the view of monetarist is supported. However, no evidence to support the structuralist view, causality runs from price level (P) to money (M). To account the stability of the estimated models due to the two inflation shocks in 1973-74 and 1980-81, the plot of CUSUM test for both equations 1 and 2 from VAR (5) were estimated. Both of the estimated values are inside 5% critical bound lines, indicating that the parameters of those models are stable over the sample period 1970Q1-1998Q4. In addition, the sample period was restricted to 1996Q4 for VAR(5) (optimal lag length) in order to avoid the effects of Asian crisis 1997-98. The results revealed that M does Granger cause P (p-value, 0.001), and P does not Granger-cause M (p-value is 0.236). The results are consistent by including crisis period.

Table 2: Results of Granger causality test (MWALD)

Null hypothesis -- >	M does not cause P (Monetrist, M ->P)	P does not cause M (Structuralist, P -> M)
Optimal lag* ('augmented'VAR order)	4 (5)	4 (5)
MWald (p-values)	18.267 (0.001)	4.591 (0.355)
CUSUM tests	within 5% critical lines	within 5% critical lines
Sensitivity tests	*MWALD (p-values)*	*MWALD (p-values)*
VAR order ('augmented'VAR order):		
8 (9)	27.009 (0.001)	6.205 (0.624)
12(13)	39.554 (0.000)	9.072 (0.697)

Note: M is log of Money (M2) and P is log of Consumer Prices. *The optimal lag length for the VAR system was selected by AIC and SC information. The period is 1970Q1-1998Q4. 'augmented' VAR order refers to VAR(k+d_{max}), where k is lag length for VAR system, and d_{max} refers to the maximum order of integration suspected to occur in the system.

CONCLUSIONS AND POLICY IMPLICATIONS

In summary, the present paper re-investigated the causal relationship between money and aggregate price level in a small open economy, Malaysia applying the MWALD test over the sample period 1970Q1-1998Q4. This econometric method accounts the biases of using bivariate specification and first differencing for nonstationary series. In contrary with Pinga and Nelson's (2001) findings of no causal relationship among money and prices, a uni-directional causality is found that is from money to price level, and supports the view of monetarist. No evidence to support the hypothesis that causality is from price to money.

Further, some policy implications can be discussed. As well-known that the objective of Malaysian monetary policy is to maintain price stability in the form of low and stable inflation in order to create a conducive environment for sustainable economic growth (Bank Negara Malaysia, 2001). As stressed by Bank Negara Malaysia (2001), effective conduct of monetary policy requires that monetary authorities are able to accurately assess the sources of current and future movements in inflation. More precisely, it is important for policymakers to distinguish whether an increase in the inflation rate is the results of supply shocks, which monetary policy cannot influence but could worse, or is the result of demand conditions, which can be directly influenced by monetary policy. However, the initial inflationary shock came form non-monetary sources, that is the steep price increases in 1973-74 and 1980-81, due to sharp increases in global oil prices should be account. Moreover, when monetary growth significantly exceeded real output growth over a protracted period, the effect has generally been felt in terms of rising prices (Bank Negara Malaysia 1999: 161). The concern is that, a rise inflation that is due to changes in demand conditions would require a monetary policy response. In contrary, a rise in inflation arising from changes in supply conditions should be addressed through other policies, such as fiscal and trade policies, that are aimed at increasing efficiency, improving the distribution network and increasing of good and services (Bank Negara Malaysia 2001).

The present study provides evidence that inflation is from momentary expansion. Thus, the money supply should be kept in check in order to keep a stable and low domestic price in the monetary policy design. On the other hand, a profound fiscal policy to curb the demand pressure is an important combination with monetary policy in order to curb price pressure. This justification can be linked to the estimated elasticity of domestic demand on Malaysian aggregate prices as proxied Real Gross National Product, that is 0.812 in long-run compare to −0.429 for Money (M1), 0.03 for interest rate, 0.38 for import prices and 0.05 for bank credit (Tang

2001:27). There to be glace that Malaysia has been relatively successful in maintaining a low inflation environment with relatively high GDP growth (Bank Negara Malaysia 1999: 159-160). However, to enjoy a trade surplus of RM36,794 million in 1998 after a long period of current account deficits over the period 1990-1997 (*Monthly Statistical Bulletin,* various issues Bank Negara Malaya), domestic price should be kept in stable and low level. This issue can be raised from Tang and Mohammad's (2000) study is that the relative price's elasticity for Malaysian imports demand is highly elastic, that is –1.76. This means high domestic prices will cause an increasing demand of imported goods that dramatically lead to trade deficits.

Further, inflation may proxy macroeconomic mismanagement that adversely affects the economy and the banking system through various channels (Demirquc-Kunt & Detragiache E.,1998: 93). In addition, macroeconomic stability is a prerequisite for successful financial liberalization (Pill and Pradhan 1997: 8). In given evidence of the possible role of financial markets in cushioning the impact of monetary expansions, economic planners must promote policies that expand financial infrastructure, to complement goals of restraining long-run inflation. Hence, an effective and profound monetary policy is a necessary to stabilize country's price level.

REFERENCES

Al-Yousif, Y. K. (1999). On the role of exports in the economic growth of Malaysia: a multivariate analysis. *International Economic Journal,* 13(3), 67-75.

Bahmani-Oskooee, M. and Alse, J. (1993) Export growth and economic growth: an applicatin of cointegration and error-correction modeling. *The Journal of Developing Areas,* 27: 535-542.

Bank Negara Malaysia. (1999). *The central bank and the financial system in Malaysia,* Bank Negara Malaysia: Kuala Lumpur.

Bank Negara Malaysia. (2001). *Annual Report 2000.* Bank Negara Malaysia: Kuala Lumpur.

Demirquc-Kunt, & Detragiache, E. (1998). The determinants of banking crises in developing and developed countries. *IMF Staff Papers,* 45(1): 81-109.

Enders, W. (1995). *Applied Econometric Time Series.* John Wiley & Sons, New York.

Ghirmay, T., Sharma, S.C., & Grabowski. (1999). Export instability, income terms of trade instability and growth: casual analyses. *Journal of International Trade and Economic Development,* 8(2):209-229.

Granger, C.W.J. (1969). Investigating causal relations by econometric methods and cross-spectral methods. *Econometrica,* 37, 424-438.

Granger, C.W.J. (1988). Some recent developments in the concept of causality. *Journal of Econometrics,* 39, 199-211.

MacKinnon, J.G. (1991). Critical values for cointegration tests, Chapter 13 in *Long-run Economic Relationships: Readings in Cointegration*, Engle, R.F and Granger, C.W.J. (eds), Oxford University Press.

Mithani, D. M., & Goh, S. K. (1999). Causality between Government expenditure and revenue in Malaysia: a seasonal cointegration test. *ASEAN Economic Bulletin,* 16(1): 68-79.

Phillips, P.C.B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika.* 75(2),335-346.

Pill, H., & Pradhan, M. (1997). Financial liberalization in Africa and Asia. *Finance & Development,* June:7-10.

Pinga, V.E.B., & Nelson, G. C. (2001). Money, prices and causality: monetarist versus structuralist explanations using pooled country evidence. *Applied Economics,* 33, 1271-1281.

Tan, H. B., & Baharumshah, A.Z. (1999). Dynamic causal chain of money, output, interest rate and prices in Malaysia: evidence based on vector error-correction modeling anlaysis. *International Economic Journal,* 13(1): 103-120.

Tang, T.C. & Mohammad Haji Alias. (2000). An aggregate import demand function for Malaysia: a cointegration and error correction analysis. *Utara Management Review,* 1(1): 43-57.

Tang, T.C. (2001). The long-run relation between price level and its determinants: evidence from Malaysia. *Utara Management Review,* 2(1): 21-32.

Tao, X, & Zestos, G. K. (1999). Sources of economic growth in Japan and Korea: causality tests. *Journal of International Economic Studies,* 13:117-132.

Toda, H.Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressons with possibly integrated processes. *Journal of Econometrics,* 66, 225-250.

Zapata, H.O., & Rambaldi, A. N. (1997). Monte Carlo evidence on cointegratin and causation. *Oxford Bulletin of Economics and Statistics,* 59, 285-298.

Demand Analysis and Recreational Value of Tawau Hills Park, Sabah

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ABSTRACT

Besides forest conservation and wildlife sanctuary, Tawau Hills National Park has potential to be a popular destination for educational, recreational and tourism activities. A visitor survey was undertaken for the purpose of understanding the demand factors and analyzing the value of the park's recreational resources. The result revealed that income was a key influencing factor for the respondents to visit the park. The next important demand factors are type of employment, age and expenses.   In addition, by using the Consumer Surplus approach, a maximum park fee could be estimated to be RM2.27.

INTRODUCTION

Tawau Hills Park (Taman Bukit Tawau) in the state of Sabah was gazetted as a national park on 7 May 1979. It was the fifth park registered in the Sabah's national park system, covering an area of 279.7 km^2. It was one the popular spots especially during weekends for various educational, recreational and tourism purposes. The main attractions for the Bukit Tawau Park include its rich bio-diversity (e.g., diverse flora and fauna composition), attractive geological features ('dipterocarpus' forest), and rivers and water catchments within the park boundary. Besides the natural attractions, the park is also equipped with basic facilities such as hostel, chalets, camping area, children playground and shops.

In spite of its various attractions, there were a few factors that can constraint visitors from visiting the Bukit Tawau Park. Communication and roads system to the park were still lacking. Road signs and markers directing visitors to the park were still inadequate. Public transports service such as taxi and buses were not always available for the public to go to the park. Moreover, high priority was given to the farmers of palm trees, cocoa and other plantations that visible along the road to the park. To some extends, their heavy trucks might be another contributing factor to the poor quality of roads. Besides that, basic amenities tendered within the park particularly public toilets, parking areas and visitors rest areas still need to be improved.

Essentially, the general objective of this paper is to analyze demand and to identify potential value of the recreational resources of Taman Bukit Tawau, Sabah. The specific objectives of this paper are:
a.   To identify social-economic characteristics of the park visitors.
b.   To uncover influencing factors of the recreational demand and willingness to pay for the entrance fee.
c.   To analyze perceptions of the visitors with regard to the quality of the provided public amenities within the park.

LITERATURE AND METHODOLOGY

Recreational activities exist due to the availability of free time. People usually look for suitable places to do their recreational activities, either individually or with somebody else. Researches conducted by Md. Som and Chee (1983), and Saidin (1980), assume that free time is best for relaxation and be involved in recreational activities. They also stated that mostly those, who involve in the recreational activities, are basically looking for means to unwind, socialize and strengthen relationships, or even to do some form of research.

Income is one of the important factors that influence people's decisions to go for a recreation (Chubb and Chubb, 1981; Jusoff, 1981; and Wan Mansor, 1983). It is especially very important to finance expenses such as park fee, accommodation, meals, transportation and other health-related charges. Additionally, the type of transportation, time

and cost of traveling are also necessarily to take into account when deciding to go for recreation (Clawson et. al., 1960; Shuib, 1991; and Wan Mansor, 1983).

Other factors like recreational preference and objectives are most of the time taken into consideration when deciding where to go (Gum and Martin, 1975; Saidin, 1980; and Wan Mansor, 1983). Whereas according to Douglass (1982), information communication is the most basic factor that affects the demand for a recreation. Recreational destinations could employ communication tools such as electronic media (television) and newspaper to publicize their existence including their benefits in order to attract visitors.

Collecting and Testing Data

Primary data of this study was principally collected through a survey (questionnaire) of the visitors of the parks. A total of 100 respondents were identified as sample size for this research. An important condition for the respondents is that they must have spent at least one whole day in the park prior to answering the questionnaire. Moreover, the questionnaire was presented in 4 sections:
i.   Personal Information such as age, gender, race, occupation, income, etc.
ii.   Traveling Information such as traveling distance and time period to get to the park
iii.   Traveling expenses. Financial information of the trip pertaining to the visitors' cost of the trip and their level of willingness to pay.
iv.   Other information including the visitors' perceptions and analysis of the quality of services provided by the park's management.

Then, the collected data was documented using SPSS and tested using Reliability Test and Analysis Factor, Kaiser Meyer Oikin (KMO) Test, Communalities Test, Variance Analysis and Components Matrix. Variables particularly age, gender, marital status, occupation, income, traveling distance and expenditure were analyzed in this study.

In addition to the research's primary objectives, this paper would also try to estimate values of consumer surplus of a trip going to the park, which could be proposed for the park entrance fee. Essential data was acquired by using Travel Cost Method (TCM) and Consumer Surplus Estimation Method from the Population and Housing Census of Malaysia by the Statistic Department Sabah (1995).

Estimating Beneficial Value Over Consumer Surplus

The total consumer surplus could be defined as the total consumer surplus from visitors over all resources within the park. This consumer surplus could be converted into travel cost by calculating the average cost of travel per kilometer. Based on the report produced by *Jabatan Pengangkutan Jalan* (JPJ), the Average Traveling Cost (ATC) for year 1996 was RM 0.50 per kilometer.

One of the assumptions for estimating value of consumer surplus is the availability of basic amenities without charge as in most recreational parks. The Clawson Demand Curve (Manstield, 1971 & Mc. Connel, 1977) is used to determine consumer surplus for each sub zones in Tawau district. In general, consumer surplus for each trip is determined by dividing the traveling cost with number of trips made by the visitors. Estimation of consumer surplus of each trip then could be used as a guide in determining the maximum entrance fee that can meet society's recreational needs.

Three steps of estimating the consumer surplus for a trip:
First:
For each sub zone (CS_j), consumer surplus is established by choosing the Semi-Log Regression demand function:

$$CS_j = \frac{V_{ij}}{Dist_{ij}} \, x A_i$$

V_{ij} - Trip per capita
$Dist_{ij}$ - Average coefficient of one way traveling distance from sub zone i to sub zone j
A_j - Population in sub zone j

Data for variables B Dist$_{ij}$ and A$_i$ are based on *Semi-Log Transformation Regression* in a report produced by the Statistics Department Sabah in 1995. Similarly, data for variables V$_{ij}$ is taken from the Statistics Department Sabah (refer to Appendix A and Appendix B). In addition, the report also pointed out that Sabah is divided into a number of sub zones. As for Taman Bukit Tawau, it is located in the zone of Tawau in sub zone 20.

Second:
Visitors' traveling cost to sub zone j (VC$_j$) is determined as follows:

$$VC_j \quad = \quad CS_j \quad x \quad ATC$$

CS$_j$ - Total of Consumer Surplus to sub zone j
ATC - Average cost of travel per kilometer

Third:
Consumer surplus for a trip to sub zone j is calculated using:

$$CS_{\,j} \,/\, Trip \;=\; \frac{VCj}{\sum_{i=1}^{n}}$$

VC$_j$ - Visitors' traveling cost to zone j (refer to the second step)
Trip - Number of trips

$\sum_{i=1}^{n} E$ - Total number of trips

RESULT AND DISCUSSION

Socio-economic Characteristics of the Taman Bukit Tawau's Visitors

Basically, the socio-economic factors identify the characteristics of the visitors of Taman Bukit Tawau. Factors such as demographic (age, gender and marital status), type of work and income were inter-related with each other in determining the demand of recreation at Taman Bukit Tawau (refer to Table 1).

The research has revealed that out of 100 respondents visiting the Taman Bukit Tawau, majority 78% were of age 16 to 25 years old. A research performed by Saidin (1980) at Taiping Museum had showed that majority of the visitors to the museum were of age 20 to 30 years old. Meanwhile, according to Jusoff (1981) reported that the majority of the visitors to the Desaru tourism and recreational area were of the age 25 to 30 years old. Thus, it can be concluded that the young generation (below 30 years old) is the most active age group especially in participating in recreational activities and sports. Age could be one the main factors in determining the visitors' behavior pattern related to recreational activities and sports. Young people are more eager to involve themselves in challenging activities that require high energy and be active compared to older generation who are keen to less physically demanding activities like playing chess and reading books.

As high as 61% of the respondents were male compared to 39% are female respondents. From this study, it may seem that men like or have more chance to be involved in active recreational activities compared to women. Similarly, Saidin (1980) discovered that male visitors had also outnumbered female visitors in going to the Taiping Museum. Additionally, the survey has also revealed that 87% of the respondents were married and only 13% were singles. Accordingly, married people most of the time may prefer to spend time relaxing and doing recreational activities together with their families.

Visitors who visited Taman Bukit Tawau could be categorized into several types of job description. Generally, they were categorized into civil servants, private sector workers, self-employed (business), students and others (example, housewife). The survey has accounted 42% of the respondents were students, 24% were from government agencies, 21% were from private sector, 4% were self-employed and the rest were 9%. A very high percentage of student

found visited the Taman Bukit Tawau were probably due to the fact that this group has the most free time to spend especially during weekends and school holidays.

According to Wan Mansor (1983), majority of the visitors to Templer Park were those who earned RM500 to RM700 per monthly. Likewise, this study has discovered that out of 100 respondents, 25% of them received income less than RM500 per month (mainly consisted of students & housewives), 45% earned between RM501 to RM750, 20% earned between RM751 until RM950. Interestingly, those who earned more than RM951 were only 10% of the respondents. It can be assumed that the lower income earners liked to visit the recreational park compared to the higher income earners, who were probably too busy with their work and probably would prefer to go vacationing somewhere outside Sabah or even Malaysia.

Table 1: Background Information of Visitors

	NO. OF RESPONDENTS	PERCENTAGE (%)
AGE		
< 15	5	5
16-20	39	39
21-25	39	39
26-30	10	10
31-40	4	4
> 41	3	3
GENDER		
Male	61	61
Female	39	39
MARITAL STATUS		
Single	13	13
Married	87	87
OCCUPATION		
Government	24	24
Private	21	21
Self-employed	4	4
Student	42	42
Others	9	9
SALARY (RM)		
<500	25	25
501-750	45	45
751-950	20	20
951-1200	10	10

In Table 2, 47% of the respondents visited the park in groups consisted of 11 to 15 person, 43% visited in group of 6 to 10 person and 3% visited in group consisting 16 to 20 people. Only 7% of the total respondents visited the park in groups consisted of less than 5 people. In general, majority of the visitors of Taman Bukit Tawau were families and school children on a school trip during school holidays in November and December. This finding is supported by Wan Mansor (1983). He reported that about 75% of the visitors of the Templer Park preferred to do recreational activities in groups. Thus, it is safe to assume most human beings like to socialize and for that reason prefer to do recreational activities and sports in groups.

Table 2: Traveling in Group

MEMBERS IN GROUP	NO. OF RESPONDENTS	PERCENTAGE (%)
< 5	7	7
6-10	43	43
11-15	47	47
16-20	3	3
> 20	-	-

Traveling to Taman Bukit Tawau

Based on Table 3, 60% of the respondents lived relatively near to the park, within the range of 1 km to 10 km. The rest 24% were visitors who needed to travel for a distance of 11 km to 20 km to the park, and 16% traveled the furthers within 21 km to 30 km. Thus, it can be necessarily concluded that the Taman Bukit Tawau tends to receive visitors who are local people and live in areas relatively near to the park.

As many as 47% of the respondents took about one hour to arrive to the park, while 43% took one to two hours and the rest, 10% took more than 2 hours for their journey to the park. The fact that big percentage of the visitors lived near to the park was probably the main explanation of the visitors' quick journey to the park. This finding also proves that distance and time has a positive interrelationship with each other. In other words, the further the distance of a recreational destination, the longer it takes to get to the destination. Clawson et. al. (1960) too maintained that traveling time is an important factor in determining the demand rate of recreational activities.

Table 3 also reveals most of the respondents (78%) were willing to go to parks located within 1 km to 10 km from their home, 15% of respondents were willing to travel for 10 km to 20 km and only 7% did not mind traveling for a 21km to 30km. This demonstrates negative relationship between distance and willingness to travel for recreational activities. It essentially means the further the distance of a recreational destination, the least likely for a visitor to want to go to the park.

Table 3: Traveling Information

	NO. OF RESPONDENTS	PERCENTAGE (%)
ONE WAY TRAVEL (KM)		
1-10	60	60
11-20	24	24
21-30	16	16
TIME PERIOD OF TRAVEL		
< 1	47	47
1-2	43	43
> 2	10	10
WILLINGNESS TO TRAVEL (km)		
1-10	78	78
11-20	15	15
21-30	7	7

Medium of traveling to the park used by the visitors is shown in Table 4. The road system connecting the main town of Tawau to the park was not satisfactory and inadequate. Apart from sharp-turned corners, the gravel road adds to the reason why public transportation as busses and taxis could not be provided sufficiently to the park. Consequently, only 3% of the respondents went to the park using public transportation. About half of the survey (51%) droved their own cars or vans, while 37% went with charter/tour buses, 1% with a rental van and 8% with motorcycles.

Table 4: Transportation Used to the Park

TYPE OF TRANSPORTATION	NO. OF RESPONDENTS	PERCENTAGE (%)
Self-owned car/van	51	51
Rentals car/van	1	1
Public bas/taxi	3	3
Charter/tour bas	37	37
Motorcycle	8	8
Total	100	100

Expenses Incurred on the Visitors

Based on this study, the visitors' primary expenses were spent on food and beverages, transportation, accommodation and entrance fee. The established entrance fee by the management of the Taman Bukit Tawau for adult was RM2 per person and school children was RM1 per person.

According to table 5, the largest group of the respondents (33%) was willing to pay only RM1.00 to enter the park and, there were just 19% who were willing to pay RM2.00 for their entrance fee and 29% preferred paying a fee ranges from 10 cents to 75 cents. Basically, the visitors' rationale for agreeing on the low entrance fee was for it to lower the overall cost of travel to the park especially those who traveled in groups. Nonetheless, there are some respondents especially students who prefer not to pay at all to enter the park.

Table 5: Willingness To Pay the Park's Entrance Fee

PARK FEE (RM)	NO. OF RESPONDENTS	PERCENTAGE (%)
0.00	19	19
0.10	3	3
0.25	1	1
0.35	3	3
0.50	18	18
0.75	4	4
1.00	33	33
2.00	19	19
Total	100	100

Table 6 indicates highest 42% of the respondents had estimated their spending ranges from RM51 to RM65 for food and drinks, and transportation. Only 9% of the survey spent more than RM81 for food and drinks, transportation and accommodations. Generally, since most of the visitors were local, they might have brought own food and drink, spent a minimum cost for transportation and did not need to stay overnight in the park.

Table 6: Total Expenses

EXPENDITURE (RM)	NO. OF RESPONDENTS	PERCENTAGE (%)
5-20	13	13
21-35	18	18
36-50	18	18
51-65	42	42
66-80	5	5
81-95	4	4
Total	100	100

Visitors Feedback of The Taman Bukit Tawau's Recreational Facilities

Recreational activities such as camping, swimming and hiking are the main factors that influence the demand of recreational parks. This is because with the activities, visitors can unwind their mind and body while having fun with their friends and families. As stated by Gum and Martin (1975), 15% of their study on recreational demand in Arizona agreed that the demand for recreational resources was primarily affected by the need to do recreational activities.

Table 7 exhibits several activities that can be done in the Tawau Hills Park. Sightseeing (35%) was the main respond from the respondent, and picture taking was the second, 25% of them. In addition, 20% of the visitors of the park swam, while 17% went for camping in the park. Generally, the respondents were inclined to go to the Taman Tawau Park for relaxation whilst enjoying the beautiful scenery in the park.

Table 7: Activities Done in the Park

TYPE OF ACTIVITY	NO. OF RESPONDENTS	PERCENTAGE (%)
Swimming	20	20
Camping	17	17
Sightseeing	35	35
Taking photos	25	25
Others	3	3

The study has found out that visitors were generally satisfied with most of the public amenities and recreational resources provided by the park. Even though the study shows that the facilities provided were much acceptable by the respondents, there were some concerns about certain aspects of the park that could still be improved, mainly public transportation, vehicle-parking facility, rest hut/areas and children playground (Table 8). Thus, the park's management needs to do something about these areas in order to increase the overall quality of the services and facilities of the park. In the hope that the need of the visitors can be met and consequently may increase the total number of visitors visiting the Taman Bukit Tawau.

Table 8: Visitors' Satisfaction of the Park's Facilities and Recreational Resources

	VERY SATISFIED	SATISFIED	NOT SATISFIED	STONGLY NOT SATISFIED
Toilets	2	82	16	-
Changing rooms	2	72	21	6
Public transportation	-	41	27	32
Security	4	88	8	-
Emergency aids	4	89	7	-
Parking spaces	1	55	23	21
Walking zone	3	87	9	1
Surau	-	73	2	-
Cleanliness	6	85	12	1
Rubbish bins	2	85	12	1
Children playground	5	57	31	7
Rest hut	5	52	27	16
Recreational equipments	5	62	26	7

According to Table 9, 48% of the survey visited the park more than 3 times in a year. The rest of the respondents visited 3 times (26%), 2 times (19%) and also 7 visitors who visited the park for the first time. The findings may imply that the park were quite successful in attracting regular visitors. In other words, visitors who were contented with the park's facilities and services and loved to go back there to do their favorite recreational activities or sports. In addition, the survey also found out that Sunday was the most popular visiting day, 83% of the respondents went visiting the park on Sundays.

Table 9: Total Number of Trips in a Year

FREQUENCY	NO. OF RESPONDENTS	PERCENTAGE (%)
Once	7	7
Twice	19	19
Thrice	26	26
> 3 times	48	48
Total	100	100

Visitors got to know about the Taman Bukit Tawau from a few sources of information (Table 10). Primarily, 75% of the survey identified the park from their friends and family. Alongside, Table 10 also able to infer the visitors' perception on effect of marketing activities of the Taman Bukit Tawau. It seems that the promotional activities through printing and electronic media were not effectively executed. As a result, only 20% of the respondents acknowledged the park from news, brochures, radio and television.

Hence, the park's management might want to review their existing marketing strategy regularly in hoping to attract more visitors, local and foreign. Moreover, the park needs to improve its communication approaches used to boost the park's image and public's respond. Essentially, communicating through printing and electronic media could provide visitors visual images of the attractiveness of the Taman Bukit Tawau.

Table 10: Information Sources of the Taman Bukit Tawau

INFORMATION SOURCES	NO. OF RESPONDENTS	PERCENTAGE (%)
Radio and Television	10	10
News and Brochures	10	10
Friends and family	75	75
Others	5	5
Total	100	100

Consumer Surplus of Taman Bukit Tawau

Estimating Consumer Surplus (CS) to be proposed as The Taman Bukit Tawau's entrance fee, employing sub zone 20 for the park. Please also refer to Appendix A and B.

Consumer Surplus (CS $_{20}$) for sub zone 20:
$$CS_{20} = \frac{0.000196}{0.125891} \times 244{,}728 = RM381.017$$

Total visitors' travel cost/expenses to sub zone 20, (VC$_{20}$):
$$VC_{20} = RM381.017 \times RM0.50 = RM190.51$$

Consumer Surplus for every trip to sub zone 20:
$$CS/Trip = \frac{RM190.51}{84} = RM2.27$$

Based on the above computation, maximum entrance fee that can be proposed to the park's management is RM2.27 per person. Apparently, this sum also signifies maximum cost that a visitor willing to spend in order to engage in recreational activities or sports at the Taman Bukit Tawau.

Reliability Test – Scale (Alpha)

The analysis is incorporating several variables includes age, gender, marital status, occupation, income, distance and traveling expenses. Accordingly, the result of the analysis shows the highest alpha value, 93.18% (more than 60%). Thus, this confirmed the appropriateness of the variables used in explaining the visitors' visiting pattern to the Tawau Hills Park.

Factor Analysis

Result from the Kaiser Meyer Oikin Test and Bartlett Test presents a value of 83.7% (more than 50%). Essentially, this means the research's sample data is suitable to be used in several factor analyses, for example Variance Test, Communalities Test and Component Matrix Test.

Variance Test

TABLE 11: Total Variance

Component	Initial			Extraction Sums of Squared		
	Total	% Of	Cumulative	Total	% Of	Cumulative
1	5.36	76.57	76.57	5.36	76.57	76.57
2	.90	12.91	89.48			
3	.37	5.38	94.87			
4	.19	2.76	97.64			
5	6.237E-	.89	98.53			
6	5.589E-	.79	99.33			
7	4.672E-	.66	100.00			

Extraction Method: Principal Component

According to the Variance Test, the variables used in this study had successfully explained the Taman Bukit Tawau's visiting patterns with 76.57%.

Communalities Test and Component Matrix

Table 12: Communalities Test and Component Matrix

	Communalities		Component Matrix[a]
	Initial	*Extraction	Componenet
			1
Age	1.000	0.868	0.931
Gender	1.000	0.735	0.857
Marital Status	1.000	0.294	0.543
Occupation	1.000	0.872	0.934
Income	1.000	0.905	0.951
Travel Distance	1.000	0.825	0.908
Travel Expenses	1.000	0.862	0.928

* Extraction method: Principal Component Analysis
a 1 components extracted

Both the Communalities Test and Component Matrix shows income as the most important variables in influencing visitors to travel to the park compared to other variables – age, gender, marital status, occupation, travel distance and cost. This is proven by the highest communalities value of 90.5%, followed by occupation (87.2%) and gender (86.8%). Similarly, the Component Matrix resulted the highest value for income (95.1%). The next two variables that may be important in swaying visitors to go to the Taman Bukit Tawau are occupation (93.4%) and age (93.2%).

CONCLUSIONS AND RECOMMENDATIONS

The study has revealed that majority of the visitors to the Taman Bukit Tawau for recreational activities were between 16 to 25 years old, male and married. Thus, main reasons they went to the park were to relax their body and mind, and also to spend valuable time with their family. Majority of them were also civil servant with income below than RM750 per month and living in areas near to the park. In addition, most visitors went to the park in groups of 6 to 15 people. Primarily, the groups consisted of families and school students.

Essentially, poor road conditions, such as gravel road with lots of portholes and sharp-turned corners, to the park might need to be restored so that more public transportations could be made available for the visitors to go to the park. Sufficient signage needs to be placed at strategic locations so as to help visitors to get to the park without hassle. Furthermore, the park's management should upgrade parking spaces and rest areas to ensure visitors' maximum comfort. Other park's facilities such as children playground, recreational equipments, restrooms, surau, and other should be adequately maintained for a topmost cleanliness, safety and comfort.

Additionally, marketing and promotion of the Taman Bukit Tawau should be reviewed regularly and done strategically to the right target market that is the local community surrounding the park. Else, the park may extend its marketing to include other methods of communication like newspapers, radio, fliers, posters and internet in order to attract more visitors especially from outside local Tawau area. In general, the park should update the general public on benefits, activities and events that are available at the park. This is vital in order to maintain the sustainability of the park.

In this study, variables that influenced the visitors' visitation pattern were fundamentally age, gender, marital status, occupation, traveling distance and cost of trip. The variable that had the most impact on the visitors' demand of the park was income, followed by occupation, age and traveling expenses.

Feedback from the respondents revealed that most of them were only willing to pay RM1.00 per person for the park's entrance fee, much lower than the current fee that is RM2.00. However, when estimating the consumer surplus, it is discovered that the maximum charge that could be applied as the park's entrance fee was RM2.27.

REFERENCES

Chubb, M. and Chubb H.R. (1981). *One Third of Our Time: An Introduction to Recreation Behaviour and Resources.* New York: John Wiley and Sons.

Clawson M, Held R.B and Stoddard C.H. (1960). *Land For The Future*. Baltimore: John Hopkins University Press.

Department of Statistics, Sabah. (1995). *Population and Housing Census of Malaysia, 1991*. Kuala Lumpur.

Douglass, R.W. (1982). *Forest Recreation*. New York: Pergamon Press.

Gum, R.L and Martin. W.E. (1975). "Problems and Solution in Estimating The Demand For and Value of Outdoor Recreation", *American Journal of Agricultural Economics*, No. 56, pp: 558-566.

Jusoff, K. (1981). "Recreation Demand: A Case Study of Desaru Resort, Johor", *Malaysian Journal of Agricultural Economics*, pp: 10-17.

Md. Som, J. dan Chee T. Y. (1983). "Hutan Rekreasi di Malaysia: Konsep Perlaksanaan", *Malaysian Journal of Agricultural Economics,* pp: 23-35.

Saidin, S. (1980). "Factor Affecting The Demand For Recreation, The Case Study of Taiping Museum", *Malaysian Journal of Agricultural Economics,* pp: 133-145.

Shuib, A. (1991). *Pengaruh Kos Masa Dalam Anggaran Faedah Rekreasi Luar*. Kuala Lumpur: Longman.

Wan Mansor, W.S. (1983). "Forest Recreation Use Patterns, User Behaviour and Recreational Value in Malaysia", *Ph.D Thesis submitted to the Department of Forestry and Wood Science,* University College of Worth Wales, Bangor.

Appendix A: Travel Cost Method

ZONE	SUB ZONE	POPULAT ION IN SUB ZONE I Ai	NO. OF RESPONDENTS B	AVG. NO. OF VISITORS PER TRIP C	ESTIMATE NO. OF TRIP D	TOTAL TRIPS BxCxD= E	TRIP PER CAPITA E/Ai=Vij
TAWAU	1	244,728	3	4	3	36	0.0001471
	2	244,728	3	4	2	24	0.0000981
	3	244,728	3	4	4	48	0.000196
	4	244,728	3	4	5	60	0.0002452
	5	244,728	3	4	3	36	0.0001471
	6	244,728	3	4	2	24	0.0000981
	7	244,728	3	4	2	24	0.0000981
	8	244,728	3	4	4	48	0.000196
	9	244,728	3	4	4	48	0.000196
	10	244,728	3	4	4	48	0.000196
	11	244,728	3	4	3	36	0.0001471
	12	244,728	3	4	5	60	0.0002452
	13	244,728	3	4	1	12	0.000049
	14	244,728	3	4	2	24	0.0000981
	15	244,728	3	4	3	36	0.0001471
	16	244,728	3	4	3	36	0.0001471
	17	244,728	3	4	4	48	0.000196
	18	244,728	3	4	4	48	0.000196
	19	244,728	3	4	4	48	0.000196
	20	244,728	3	4	7	84	0.000196
LAHAD DATU	1	118,096	3	4	5	60	0.00005081
	2	118,096	3	4	6	72	0.0006097
SEMPO RNA	1	91,828	3	4	3	36	0.000392
	2	91,828	3	4	5	60	0.0006534
	3	91,828	3	4	4	48	0.0005227
	4	91,828	3	4	4	48	0.0005227
	5	91,828	2	4	3	24	0.000261
KUNAK	1	39,873	3	4	2	24	0.0006019
	2	39,873	3	4	6	72	0.0018057
	3	39,873	3	4	3	36	0.0009028
	4	39,873	3	4	7	84	0.0021067
	5	39,873	3	4	5	60	0.0015048
	6	39,873	3	4	3	36	0.00090287
	7	39,873	2	4	4	32	0.000803
TOTAL						1520	

Source: Population and Housing Census of Malaysia by the Department of Statistics (Sabah), Malaysia (1995).

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Appendix B: Consumer Surplus For Every Sub-Zone

ZONE	SUB ZONE	NO. OF POPULATION IN SUB ZONE I Ai	TRIP PER CAPITA Y	COEFISIEN ONE-WAY TRIP Dist ij	CONSUMER SURPLUS FOR EVERY ZONE CS I
TAWAU	1	244,728	0.0001471	0.125891	285.957
	2	244,728	0.0000981	0.125891	190.703
	3	244,728	0.000196	0.125891	381.017
	4	244,728	0.0002452	0.125891	476.661
	5	244,728	0.0001471	0.125891	285.957
	6	244,728	0.0000981	0.125891	190.703
	7	244,728	0.0000981	0.125891	381.017
	8	244,728	0.000196	0.125891	381.017
	9	244,728	0.000196	0.125891	381.017
	10	244,728	0.000196	0.125891	285.957
	11	244,728	0.0001471	0.125891	476.661
	12	244,728	0.0002452	0.125891	95.254
	13	244,728	0.000049	0.125891	190.703
	14	244,728	0.0000981	0.125891	285.957
	15	244,728	0.0001471	0.125891	285.957
	16	244,728	0.0001471	0.125891	381.017
	17	244,728	0.000196	0.125891	381.017
	18	244,728	0.000196	0.125891	381.017
	19	244,728	0.000196	0.125891	381.017
	20	244,728	0.000196	0.125891	381.017
LAHAD DATU	1	118,096	0.00005081	0.125891	47.655
	2	118,096	0.0006097	0.125891	571.948
SEMPORNA	1	91,828	0.000392	0.125891	285.934
	2	91,828	0.0006534	0.125891	476.606
	3	91,828	0.0005227	0.125891	381.27
	4	91,828	0.0005227	0.125891	381.27
	5	91,828	0.000261	0.125891	190.38
KUNAK	1	39,873	0.0006019	0.125891	190.637
	2	39,873	0.0018057	0.125891	571.913
	3	39,873	0.0009028	0.125891	285.94
	4	39,873	0.0021067	0.125891	667.247
	5	39,873	0.0015048	0.125891	476.609
	6	39,873	0.00090287	0.125891	285.94
	7	39,873	0.000803	0.125891	254.331
TOTAL					RM 11,547.303

Source: Population and Housing Census of Malaysia by the Department of Statistics (Sabah), Malaysia (1995).

Small Firm Owner-Managers' Networks in Tourism and Hospitality

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ABSTRACT

Firms participate in network relationships with others to reap the resources that are unavailable within. The resources may consist of goods, services, information, advice or support. The flow of resources into the firm has the potential enhance the capability of a firm to react to the external competitive environment. Generally network relationships can be formal and/or informal. For a small firm, a network is more likely to be informal and have social links to individuals such as family, friends and acquaintances. This paper investigates the network features and networking activities of the small tourism and hospitality owner-managers. The context of the research is the owner-managers of chalet accommodation firms located at the coastal and island destinations in the east of Peninsular Malaysia. The networks are composed of family and ethnic linkages and mainly bounded by specific locality like the 'village'. Informal ties are with those with a common interest in tourism product and services within a destination. The networks contacts for business and social purposes are consisting the same people. Chalet owner-managers attached to family for financial and friends for other matters throughout the business life. This was due to the trust that built through the years of relationships with the strong ties. Furthermore, the main reason for networking with the contacts was for exchange of ideas, advice, and help. The owner-managers found that the networks did not generate tangible benefits, however were strong in knowledge sharing.

INTRODUCTION

Small firms dominate the tourism and hospitality industry (Morrison 1998; Page *et al.* 1999; DTI 2003; Bastakis *et al.* 2004). For example, according to DTI (2003) small hotels and restaurants with less than 50 employees represent 83.5 per cent of the businesses in the sector. A similar pattern is expected to appear in every European country (Bastakis *et al.* 2004). It applies to Malaysia, where 65 per cent of the total hotel supplies are small (Ahmad and Morrison 2004). There are a high proportion of small firms in the accommodation sector. According to Morrison (1996), traditionally, there are four factors that lead to the high number of small hotels. Firstly, there is relative ease of entry into the sector. It is understood that the initial capital to start up a small accommodation business is lower than in other industries. Specific qualifications and professional requirements related to the sector are necessary but not compulsory (Quinn *et al.* 1992; Lerner and Haber 2000; Szivas 2001). Secondly, the market demand for small accommodation is high at a variety of locations and not subject to fulfilling standardized corporate rules. Therefore, small accommodation providers can offer a wide quality range of products, facilities and special services to a niche market. Thirdly, the nature of a small firm is such that it allows an owner-manager to respond quickly to customer needs and expectations. As a result, customer satisfaction can be achieved through personal encounters with the guests. Finally, a small hotel, often owned and managed by a family, can be economically viable. The market seems to be limited and specialized and suited to a firm with low overhead costs and does not offer the high level of profit required by a large enterprise. This is caused by the economic advantage of using family labor (Andriotis 2002; Getz and Carlsen 2000; Lowe 1988). Furthermore, the small hotel owner is likely to be willing to accept a compromised profit to experience some quality of life (Szivas 2001).

A small hotel is not a smaller version of a large hotel (Lowe 1988). The management structure, style, and approaches in a large hotel are academically right and efficient. However, they are not necessarily applicable or achieve the same results if applied in a small hotel. Obviously, small tourism and hospitality firms have much in common with their larger counterparts; however, they operate according to often quite different rules; for example, differences found in business objectives, management style and access to funding (Friel 1999). Thus, it is suggested that a different approach should be applied to managing a small hotel. Moreover, Morrison and Thomas (1999) suggest that it should be recognized that significant management issues confront small hospitality firms, including marketing, strategic management and growth, information technology, and entrepreneurship. In addition, the lack of

knowledge of other businesses related to tourism and the hospitality sector pressurized the progress of the firm (Page *et al.* 1999). To overcome such pressure Page *et al.* (1999), suggested small firms become members of tourism organizations and other business associations. Joining the associations will lead to a coordination of this diverse sector. The low entry barriers to the tourism and hospitality business (Morrison 1996; Ateljevic *et al.* 1999) place constraints on the finances and knowledge of the small firm owners. Therefore, the owner seems to seek help and advice on financial and management matters from outside, whether from family and friends or professionals. Some proactive owners obtain information and advice on financial and managerial matters from informal networking with other businesses, business associations and tourism organizations (Ateljevic *et al.,* 1999). It clearly shows that the constraints of finance, supplies and managerial knowledge can be reduced through networking with other related parties. Thus, a networking strategy with a formal and informal network is called for, as suggested by the relevant literature (Augustyn and Knowles 2000; Ateljevic *et al.* 1999; Copp and Ivy 2001; Lynch 2000; Morrison 1998; Telfer 2001; Tinsley and Lynch 2001).

A PROFILE OF SMALL TOURISM AND HOSPITALITY FIRMS' OWNER-MANAGERS

It is understood that most small tourism and hospitality businesses were owner operated (Ateljevic *et al.* 1999). A study by Getz and Carlsen (2000) found that more than 96 per cent of their respondents were the owners of tourism businesses and the remaining were the managers, who were family members. The dominant age of small business owner-managers' is middle-aged, for example, more than 40 per cent were between 45 and 54 years old in Australia (Getz and Carlsen 2000), and about 77 per cent were slightly older than 45 years old in the UK (Szivas 2001). Most of them were reported married (Getz and Carlsen 2000). Generally, small firms are owned-managed by men, but more women owner-managers were in the tourism and hospitality industry. For example, in more than 80 per cent of small firm owner-managers in cross industries survey in Australia were male (Morrison *et al.* 2003). In the tourism and hospitality however, approximately 60 per cent were female (Getz and Carlsen 2000). In terms of educational background, according Getz and Carlsen (2000), the largest group (42.2 per cent) of owner-managers in Australia had high school qualifications; about 34 per cent had college diplomas and university degrees; and approximately 12 per cent had a trade qualification. Most of the owner-managers in the UK were reported to have had higher education, as about 70 per cent had college, HND or university degrees, and only 24.5 per cent had only secondary school education (Szivas 2001). Due to easy entry into the tourism and hospitality business, many owner-managers were reported to have various types of occupations and experience prior to venturing into this sector (Szivas 2001; Ateljevic *et al.* 1999). For example, about one-third of the owner-managers have had work experience in the tourism and hospitality industry in the UK, but others were from agriculture, retail, education and other sectors (Szivas 2001). In New Zealand, however, previous job experience in tourism and hospitality was not particularly represented, but the most common experiences were farming activities, and others such as teachers, marketers, builders and carpenters (Atlejevic *et al.* 1999). Since previous occupations and experience were not the compulsory requirement for entry into the tourism and hospitality business, owner-managers learnt the needed skills on the job (Szivas 2001). However, some of them were reported to attend formal tourism and hospitality related courses for example, marketing, management, cooking, hosting, and computing courses after starting-up the businesses. Moreover, during the courses, owner-managers mentioned that they found the courses provided a good networking opportunity to meet other people with a common business interest (Ateljevic *et al.* 1999). Small firm owner-managers were reported to use this networking as a source of knowledge for improving operations and marketing of the firms (Frazier and Niehm 2004). According to Frazier and Niehm (2004), the networking may provide different resources, however, it serves as an opportunity for small firm owner-managers.

SMALL FIRM NETWORK

According to Perry (1999), small firm networks are constructed around social networks developed through associations formed by family, friends and acquaintances. The small firm networks can be viewed in the form of types of networks that are represented by different linkages, which are family and ethnic, place, organizational, and buyer-supplier networks. The linkages of family and ethnics are based on the utilization of personal and family contacts that are usually embedded in close-knit communities (Fadahunsi *et al.* 2000; Perry 1999; Ram 1994). The examples of this type of network are the Overseas Chinese networks, ethnic minority enterprise and business family (Fadahunsi *et al.* 2000; Haley and Tan 1999; Perry 1999; Ram 1994). They engage in business activities that can operate on the basis of capital and gain an advantage from the flexibility of labour drawn from family members. The place network, which is usually referred to as an industrial district network is based on cooperative and

competitive business relations in a geographical locality. Small firms operate in an industrial district and share a common industry, values and goals. However, they operate with a high degree of specialization and a high use of subcontracting. Examples of industrial district networks are the Third Italy, Silicon Valley and Baden-Wurttemberg (Staber 1998). The third type of small firm network suggested by Perry (1999) is an organizational network that ties the firms under a common ownership, like business groups or joint ventures or an associate with a large firm. Examples of small firms that associate with large firm networks are the Japanese *keiretsu* and Korean *chaebol* (Kienzle and Shadur 1997). Another network relationship that ties a small firm is membership with the chamber of commerce or industry association. The final type of small business network is the buyer-supplier network that is formed through relational contracting or ongoing relations of exchange.

Small firm networks may be distinguished by different linkages according to the form of the type of network (Perry 1999). However, they share the same structural characteristics. The small firm network can be measured by its characteristics: the density; diversity; relationships and ties; and the trust and network content (Birley *et al.* 1991; Cromie *et al.* 1994; Field *et al.* 1994; Johannisson and Nilsson 1989; Johannisson 2000).

NETWORKING IN THE TOURISM AND HOSPITALITY INDUSTRY

There appears to be increasing attention given to the importance of networking in the tourism and hospitality industry (Augustyn and Knowles 2000; Ateljevi*c et al.* 1999; Chathoth and Olsen 2003; Copp and Ivy 2001; Leslie and McAleena 1990; Lynch 2000; Medina-Munoz and Garcia-Falcon 2000; Morrison 1998; Morrison *et al.* 2002; Page *et al.* 1999; Pavlovich 2003; Telfer 2001; Tinsley and Lynch 2001; Hwang *et al.* 2002). The network approach has been used to achieve a variety of functions for tourism and hospitality firms: marketing strategies (Leslie and McAleena 1990; Morrison 1998); collaboration between firms at the destination (Augustyn and Knowles 2000; Medina-Munoz and Garcia-Falcon 2000; Page *et al.* 1999; Telfer 2001; Tinsley and Lynch 2001); as a tool for obtaining resources, information and advice (Ateljevi*c et al.* 1999; Augustyn and Knowles 2000); and networking activities among firms within the networks (Copp and Ivy 2001; Lynch 2000). Collaboration between a tourism firm and other tourism businesses and with other organizations has been linked to the development strategy of tourism destinations (Augustyn and Knowles 2000; Medina-Munoz and Garcia-Falcon 2000; Page *et al.* 1999; Telfer 2001; Tinsley and Lynch 2001). For example, a strategic alliance between a trade organisation, wineries, grape growers and government organizations has led to the development of wine tourism in Niagara (Telfer 2001). In an investigation of the level of co-operation within the wine tourism industry in the Niagara region, Telfer (2001) reported that formal and informal collaboration, and vertical and horizontal linkages exist between all sectors. The wineries are formally allies with wine associations and regional wine councils, and informally promote other area wineries by word of mouth to visitors during their interaction. Horizontal linkages between the wineries, wine boards and organizations, and marketing agencies have developed the Niagara Wine Routes as tourist products; whilst the vertical collaboration with tour operators, accommodation providers, restaurants and festival organizers has supported the tourist activities in the destination. Collaboration benefits all the tourist product providers through joint marketing initiatives (Hwang *et al.* 2002; Leslie and McAleenan 1990; Morrison 1998), knowledge sharing (Telfer 2001), and the creation of new products, as well as promoting the destination and contributing to destination development (Tinsley and Lynch 2001), and because of a personal need to belong to a particular association such as 'Master Chefs of Great Britain' (Oliver 1990).

However, Hwang *et al.* (2002) argue that networks in tourism and hospitality may not be homogenous: they instead suggest that each sector belongs to a different network. This is related to the different purposes served by different organizations or associations. For example, trade associations aim to provide services to members to reduce costs, and the marketing consortia assists firms in their sales and marketing efforts. Furthermore, according to Hwang *et al.* (2002), other features are the geographic coverage, the size of the firm and the nature of the business it serves, whether local or international. Clearly, this indicates that a specific study should be carried out for a specific sector or sub-sector.

In another example, a social or informal network is considered to play an important role in the business development of micro and small firms in the hospitality sector (Lynch 2000). In a homestay networking study, Lynch (2000) suggests that networks at all levels are more likely to be informal with a high content of affective relationships. In the networking activity, the hosts were identified as giving advice on cost cutting and reference for good practice. As a result, the informality is seen to influence the quality of host and supports interventions, and the training and development of the host family sector. Lynch (2000) predicts that there may be similar relevance in other accommodation sectors. Furthermore, the context of Lynch's (2000) homestay networking study was in an urban

setting; thus, it is appropriate for further research to take place in a rural setting. Moreover, networking activity is considered important to the small tourism and hospitality firms for their survival. Therefore, networking activities allow the small firm owner-managers to learn from others' success factors as well as to obtain information and advice on business and social matters. However, how small tourism and hospitality owner-managers participate in the networking has not been explored in any depth.

JUSTIFICATION FOR FURTHER RESEARCH AND FACTORS CONSIDERED IN THE STUDY

Hwang *et al.* (2002), suggest that each sector belongs to a different network, which has its own purpose. This means the small accommodation sector, particularly the chalet accommodation sector, may have a network with a specific purpose. Therefore, a further research to investigate the network in the small chalet accommodation sector should be carried out. According to Lynch (2000), the informal network has influence on the homestay firm's business development, and he suggests it also appears in other accommodation sectors. Furthermore, the context of Lynch's (2000) homestay networking study was in an urban setting. Therefore, it is appropriate for further research on networks in the context of the small chalet accommodation sector, to be carried out in the rural setting particularly at the coastal and island destinations. It was understood that owner-managers make and build relationships through networking activities. Therefore it is appropriate for further research to examine the activities engaged in by small chalet owner-managers in networking.

In order to carry out this research on the small chalet accommodation firm, several factors are now considered relevant for the study. Firstly, is the type of the owner-manager' networks. This is identified using Perry's (1999) small firm network types: family and ethnic; place; organisational; or buyer-supplier. It is considered important to identify the network type in order to understand the features, characteristics and linkages of the networks. However, in contrast to the manufacturing sector, buyer-seller relationships may not be significant for the small chalet sector. The second factor is the content of the owner-managers' networks. To understand this, Mitchell's (1973) and Szarka's (1990) classifications are used: communication, exchange, and normative (social). The content of the networks is most likely similar to all networks; however, the content details may be different depending on the ties of the relationships (Johannisson 2000; Mitchell 1973; Szarka 1990). Thirdly, is the utilizations of the network relationships by the owner-managers of the small accommodation firms. This is to understand how owner-managers utilize networking relationships in order to overcome business problems in the early years of business and at the later stages. Lastly, the motivation and benefits of the network. It is important to understand the factors considered by the owner-managers before joining network relationships and to identify the benefits gained from networking (Hwang *et al.* 2002). Therefore, the outcome of the networks for the owner-managers can be measured.

Drawing from literature (Fombrun 1982; Davern 1997; Ebers 1997; Grandori and Soda 1995; O'Donnell *et al.* 2001), the working definition of a network to be employed in this study is established as follows:

> 'a set of relationships between the individuals that exist, planned or unplanned, for the actors to achieve business or social purposes. It also serves as a platform for the individuals to interact in the networking activities. The individuals can be owners or managers of small firms, or any person, any firm, association or a group of people that has network relationships with them. It should become a kind of place to exchange resources, ideas, discussion or just meet for business or social events.'

METHODOLOGY

The interview technique was used as the primary data collection instrument for this case study. It was considered appropriate and it is the most common fieldwork strategy in small business research (Curran and Blackburn, 2001; Tinsley and Lynch, 2001). The respondents were interviewed face-to-face individually at their place of business, and at preferred times. A semi-structured and open structured interview format was used. This facilitated ease and speed of response to straightforward questions requesting demography information and the social network features, while the open structure allowed free response to enhance the richness relative o information related to networking (Falon and Kriwoken, 2003; Pavlovich, 2003; Tinsley and Lynch, 2001). To manage the interview effectively, a case study protocol was prepared prior entering the fieldwork. According to Yin (1994), case study protocol is essential for multiple cases. Using a case study protocol standardizes the data collection procedure to ensure that every case is investigated in a similar manner (Arthur and Nazroo, 2003; Rowley and Purcell, 2001; Walsh, 2003). It contains the interview procedures, case selections procedures, interview questions and data analysis pan. Thirty-

seven small chalet owner-managers were interviewed at coastal and island resorts in the east coast of Peninsular Malaysia. The participants were selected using the criteria and snowball sampling techniques. The criteria for selection were: the chalet operates within the selected geographic areas as mentioned above; located near coast or beach; small in size; owned by individual/s; and managed in a personalized manner by the owner or manager. The snowball sampling applied when an owner-manager interviewed recommend the next owner-manager to be interviewed.

Data gathered from the semi-structured interview questions, which was quantifiable, was grouped into categories and transferred to spreadsheet for analysis. The analyses performed were generally descriptive that measure frequencies and percentages, and cross tabulation in selected cases. Qualitative data from open structured questions were transcribed, analyzed using content analysis to observe the counts of the meaning s of the significant data being mentioned. The most common meanings were group and categorized to create themes (Walsh, 2003). A total of 11 key themes emerged providing the framework within which to organize findings regarding the small firm network in the small accommodation sector. These are summarized in Table 1.

Table 1: Key Emergent Themes

Owner-managers' characteristics
Network relationships
Participants in business discussion
Content of discussion with the network contacts
Benefits from the network
Impact of networking
Social network relationships
Network motivation
Factor considered for networking
Help network
Problems anticipated in the network

FINDING

The majority of the small chalets are owned and managed by the same person (59.5%), with the remainder operated by a manager. Interestingly, most of the managers had a family relationship to the owner. This was explained on the basis that the owner was more likely to trust a family relation in comparison to an employee who was not. Male owner-managers dominate (81.1%) the sample, which is not a surprising finding as this is a reflection of the local culture where males enjoy more privileges than females, are recognised as the head of the family, and main decision-maker. Regarding the age of the owner-managers, 45.9 percent fall within the 30 to 45 brackets, 18.9 percent were younger than 30, and 35.2 percent were older than 45 years. The oldest grouping consisted the pioneers in the business, while the younger ones had either taken over from the previous generation, or had started a new business on land owned by their parents.

Few of the owner-managers admitted to relationships with formal networks. Indeed, only 40 percent had joined a tourist association, for example, the Pulau Tioman Boatmen Association. It provides boating services to tourists such as island hopping tour, transportation for diving or fishing trips and short distance water taxi. Approximately 10 percent had linkages with agents for marketing purposed, representing the chalets in major cities such as Kuantan, Kuala Lumpur, Johor Bahru and Singapore. Significantly, 27 percent were members of political organisations (parties). However, network relationship with any other organisations was informal, and centred on the family, friends and acquaintances. In excess of 90 percent had networking relations with family members, 56.7 percent with friends, 35.1 percent with relatives, and business associates (32.4 percent) were also included.

It was found that the owner-managers had discussed business related matters with only a small number of people within the previous 12 months. Over half of them had had business discussion with 5 people or less, approximately 30 percent mentioned having discussed business matters with between 6 to 10 people. During the interviews, the respondents were asked to identify up to five names and relationships of contacts with which they discussed business matters. Dominant were family members (43 %), followed their relatives (21.5%), friends (18.8%), and their spouses (8 %). Other types of relationships of the contacts to the owner-managers were business associates (4.7 %), the employer (2.7 %) and the government officers (1.3 %). This pattern of relationships was reflected across all the cases.

Small firm owner-managers discussed the following aspects of business related matters with their business networks: chalet management (27.5 %); business operation (24.5 %); financial matters (20.4 %); advice and new ideas (13.3 %); coordinating the tourism activities (6.1 %); services (5.1 %)' and other (3.1 %) than the above mentioned. Surprisingly, most of the owner-managers found that the networking did not provide many tangible benefits. According to the owner-managers' opinions networking did not help in costs sharing (100 percent) and cost reductions (100 percent). Only 20.6 percent mentioned that sales increased, while majority saw no increase in sales. Just 15.2 percent enjoyed credit facilities and discounts from the networks. However, this was not the case for the remainder. Networking provides increased market coverage for only 5.9 percent, and 29.4 percent said that there was some improved in business performance. However, networking activities did provide knowledge sharing to half of the owner managers.

The networking activities had had some impact on individual owner-manager; however, this differed from one to another, which may be related to the individual's reasons for networking. Where positive impacts were recognized, it was found that these owner-managers had: gained a degree of positive self-improvement resulting from advice from those they considered to be their senior; their friendship and relationships within the network were better than others; and they had experienced learning and new ideas from other contacts that worked well in their own businesses. The problems faced by owner-managers in the islands were transportation and supplies of materials. As predicted, the locals did not welcome the outsiders. However, they commonly shared problems like limited funding and marketing. To overcome these problems, owner-managers sought help from various sources like family, the government development agency, business contacts, banks and friends. Most of the help sought from family was for financial as disclosed by an owner-manager:

> 'I borrowed from my father RM1000, my brothers Bidin and Sani RM1000 each to buy furniture
> for my guest house' (INT6)

Owner-managers regularly went to see friends for support whenever family members were unable to help because not involved in the chalet business. For example, they mentioned:

> 'morale support and advice from friends made me stay in the business' (INT15)
> 'I discuss with friend like T.H., an outsider chalet owner for advice' (INT32)

In the 1990's a government agency, Majlis Amanah Rakyat (MARA) introduced a special scheme to help the local people in tourism destinations to start small business. With the business associated, owner-managers arranged the transportation and delivery services. There was only a small number of owner-managers indicated had using travel and sales agent to market their chalets. The reasons for networking with others were to get opinion and learn something new from the network contacts as claimed by owner-managers:

> 'when you are alone, always think what you do is the best. When there are two of you ill get more
> options, more ways and ideas with three or four. To me, we get more knowledge and opinions
> when discussing with others..'(INT10)
> 'With discussion with other people I noticed they brought up something that I never thought of'
> (INT16)

Another reason for networking was to working together with other tourism and hospitality sectors as given by an owner-manager:

> 'I am managing this chalet, and other people manage a boat service so we have to work together to
> get tourists here' (INT5)

Therefore, they expect the network could provide benefits and facilities such as:

> 'to get access to other things that we need' (INT9)
> 'We want to get some facilities and benefits from the association, especially at the boat counter at
> the Berjaya Hotel' (INT7)
> 'advice, support and opinion from best friends'(INT14)

Before they engaged in network relationships, owner-managers tried to satisfy the requirement they set for networking. Factors considered were: trusting the contacts; having known the contacts for a certain period of time; coming from the same village as the owner-manager; having the same interest in business; and able to offer some help for business. Trust became a major factor considered in deciding whether or nor to engage in the network. Trust was built from the friendships as explained by owner-managers:

> 'Trust, as I mentioned earlier: Iknew them so I could rely on them' (INT16)
> 'Trust came naturally from the friendship. However, I have tested their realiability…'(INT27)

The problems that appeared in the formal network were with the management of the association and unethical business conduct of the marketing and sales agent. For example, some of the owner-managers complaint about:

> 'the problem was with the people, who were also the committee members in-charge at the association's counter; they load tourist only in their boats. The ordinary members hardly get a turn..' (INT7)

> 'I don't deal with an agent anymore. He was not honest in marketing our chalets. The agent always promised the guest the things that we never provide. When the guest arrived, they demanded the facilities and services that had been promised by the agent. This caused bad relationships with the guests..'(INT8)

DISCUSSION AND CONCLUSIONS

Despite the supposed business purpose of the networks investigated they were found to have two strong social dimension to them as identified by Perry (1999): they are composed of family and ethnic linkages that use personal and family contacts embedded in a close-knit community; and place is important in that the owner-managers have developed relationships with business contacts within a specific geographic locality, mainly as bounded by the 'village'. Contributing factors to these dimensions are: the remote geographic location of the communities researched, and time and cost factors may restrict regular communication and meetings with contacts further a field; most of the households in all destinations researched are involved in tourism and hospitality related activities, leading to networking with people with the same interests, sharing a similar type of life and problems that may not be fully understood by outsiders; and most represent family businesses utilising family members in the labour force. A finding that is consistent with Andriotis (2002).

In contrast with literature (Getz and Carlsen, 2000), this research found more male owner-managers in the chalet sector. The influence of culture that considered the man as the family decision maker contributes to the higher number of men named as owner-managers in Malaysia. They were younger compared to other countries (Getz and Carlsen, 2000; Szivas, 2001). The networks are male-dominated, as is the local culture a feature previously identified by Birley *et al*. (1991) and Cromie *et al*. (1994). A strong preference is demonstrated for informal networks composed of a close network of actors, the majority of which can be classified as family, friends and/or acquaintances as has been supported by Granovetter (1973). They represent close-knit and dense networks, with information travelling and spreading through them fast and easily as found by Cromie *et al*. (1994). There is an absolute minimal inclusion of government officials as network contacts, and as with other research (Friel *et al*., 1994) any formal networks were composed of professionals, such as, accountants, bank managers, or lawyers. These network relationships appeared to be more likely informal and was based on trust. The relationship features are similar to Chinese family business networks.

Owner-managers relied on the strong ties of family members and close friends during the early years of business. The tie with the family was for financial matters particularly for start-up fund, while with friends for support and advice. Similar to Szivas (2001), owner-managers get help for start-up capital top-up from family members, however in this case friends were not included. There was evidence to show that the tie was extended beyond strong ties such as with government agencies (MARA) and banks for financial assistance. At the later stage, owner-managers utilized the network in discussion on business matters. Business related matters discussed indicates the following reasons for network: enhanced management and operational capabilities; stimulation of ideas generation that can result in innovation; formation of alliances to assist in the co-ordination of products and services at tourist destinations; and advice and knowledge sharing. Owner-managers use their networks as a platform to discuss their problems in running their business, which confirms previous small firm research (Cromie *et al*., 1994; Fields *et al*., 1994; Johannisson and Johnsson, 1988). Furthermore, owner-managers tended to discuss different business aspects with different network contacts, a feature highlighted by Field *et al*. (1994) and Johanisson and Johnsson (1988). The aspects were financial and operation management with the partners and employee whose also family members, idea and advice with friends, and other facilities and industry support with government officers and various business people. These network contacts were considered to be almost the same network in the early years. Therefore the owner-managers utilized the same networks contacts in order to get help and support throughout their business life regardless of the life stage of the firm.

This research found that the main motives for chalet owner-managers engaging in network relationships were to learn from others and to get access to resources they needed. The interaction with other people amongst their network contacts provide more options and ways to do things, furthermore they can learn new things and get fresh

knowledge particularly from the senior or more successful network contacts. Owner-mangers used business networking with formal and informal network contacts to gain access to facilities, namely financial assistance and delivery. However, networking can also become a platform for socializing with friends without focusing on business purposes. Since the ties of relationships are more likely informal, which means there are no written rules to obey, the network contacts have to be carefully selected. For the selection criteria, trust was the primary factor and it binds the network. Other factors are the network contact was someone who they had known, often was a childhood friend or and old friend; a local, who came from the same village or district as the owner-manager; had the same kind of interest, whether in business or in social aspects. However, the contact should also be able to contribute in networking, particularly in helping the owner-managers' business in whatever way.

The chalet owner-managers found that networking did not provide many tangible benefits for them. The networks did not help in reducing risks and cost sharing. This happened because there was no evidence of cooperation in developing joint products or joint marketing as suggested by literatures (Telfer, 2001; Morrison, 1998). Furthermore, these were not considered in their networking motivations. However, there were very few benefits in terms of access to a wider market, credit and discount facilities or an increase in sales. The greatest benefit they got from the network was knowledge sharing. It was gained through the networking with other chalet owner-managers, friends and other business people related to the sector, supporting previous research findings (Ateljevic *et al.*, 1999; Augustyn and Knowles, 2000). Networking, however had some impact on individual owner-managers such as positive self improvement resulting from advice from the senior and successful owner-managers; gaining experience and learning new ideas; and harmonious friendships and relationships with the network contacts.

Thus, it can be concluded that the networks researched demonstrated the following characteristics:
- High density of social actors strongly connected to each other primarily through family and ethnic relationships;
- Low diversity in that the owner-managers chose to network with those from within the family and ethnic groups and within relatively closed geographic boundaries;
- Informal network bonds based on friendship and trust relationships;
- High utilization of the same network of contacts throughout the business life of the chalet firm;
- Ties that derive a common interest in tourism product and service provision within a specific destination; and
- Content appears to be dominated by the knowledge sharing benefits derived during networking.

REFERENCES

Ahmad, G., and Morrison, A. (2004), Small firm social networking in tourism and hospitality, Proceedings of Tourism:State of the Art II, 27-30 June 2004, Glasgow, UK.

Augustyn, M, and Knowles, T. (2000), 'Performance of tourism partnerships: a focus on York', *Tourism Management*, 21, 341-351.

Andriotis, K. (2002), 'Scale of hospitality firms and local economic development-evident from Crete', *Tourism Management*, 23, 333-341.

Ateljevic, J., Milne, S., Doorne, S., and Ateljevic, I. (1999) '*Tourism Micro-firms in Rural New Zealand Key Issues for the Coming Millennium',* Wellington, New Zealand Victoria University Tourism Research Group.

Arthur, S. and Nazroo, J. (2003), Designing fieldwork strategies and materials, in Ritchie, J. and Lewis, J. (eds), *Qualitative research practice: a guide for social science students and researchers*, Sage Publications, London: 109-137

Bastakis, C., Buhalis, D., and Butler, R. (2004), 'The perception of small and medium sized tourism accommodation providers on the impacts of the tour operators' power in Eastern Mediterranean', *Tourism Management,* 25, 151-170.

Birley, S. (1985), 'The role of networks in the entrepreneurial process', *Journal of Business Venturing,* 1, 107-117.

Birley, S., Cromie, S. and Myers (1991), 'Entrepreneurial networks: their emergence in Ireland and Overseas', *International Small Business Journal,* 9, 4, 56-74.

Copp, C.B., and Ivy, R.L.(2001), 'Networking trends of small tourism businesses in post-socialist Slovakia', *Journal of Small Business Management*, 39,4,345-353

Cromie, S., Birley, S. and Callaghan, I. (1994), Community brokers: their roles in the formation and development of business ventures, in: MaVeciana, J. (ed), *SMEs: Internationalization, Networks and Strategy,* Avebury, Hants.

Curran, J. and Blackburn, R.A. (2001), *Researching the Small Enterprise*, Sage Publications, London

Davern, M. (1997), 'Social networks and economics sociology: a proposed agenda for a more complete social science', *American Journal of Economics & Sociology,* 56, 3, 287-302.

DTI, (2003), 'Statistical press release', http://www.sbs.gov.uk/statistics accessed 25 May 2004.

Ebers, M. (1997), Explaining inter-organization network formation, in: Ebers, M. (ed), *The formation of inter-organizational networks,* Oxford University Press: Oxford.

Eccles, R.G. (1981), 'The quasi-firm in construction industry', *Journal of Economic Behavior and Organization,* 2, 335-357.

Fadahunsi, A., Smallbone, D. and Supri, S. (2000), 'Networking and ethnic minority enterprise development: Insight from a North London study', *Journal of Small Enterprise Development,* 7, 3, 228-240.

Fallon, L.D. and Kriwoken, L.K. (2003), 'Community involvement in tourism infrastructure- the case of the Strahan Visitor Centre, Tasmania', *Tourism Management*, 24, 289- 308.

Fombrum, C.J. (1982), 'Strategies for network research in organizations', *Academy of Management Review,* 7, 2, 280-291.

Frazier, B. J., and Niehm, L. S. (2004), 'Exploring business information networks of small retailers in rural communities', *Journal of Development Entrepreneurship*, 9,1, 23-42.

Friel, M. (1999), 'Marketing practice in small tourism and hospitality firms', *International Journal of Tourism Research,* 1, 97-109.

Getz, D., and Carlsen, J. (2000), 'Characteristics and goals of family and owner-operated business in the rural tourism and hospitality sectors', *Tourism Management,* 21, 547-560.

Granovetter, M.S. (1973), 'The strength of weak ties', *American Journal of Sociology,* 78, 1360-1380.

Grandori, A., and Soda, G. (1995), 'Inter-firm networks: antecedents, mechanism and forms', *Organization Studies,* 16, 2, 183-214.

Haley, G. and Tan, C.T. (1999), East vs. West: strategic marketing management meets the Asian networks', *The Journal of Business & Industrial Marketing,* 14, 2.

Hwang, J., Jones, P., Westering, J. V., and Warr, D. (2002), 'Best Practice in Partnerships & Networks for SMEs in The UK Hospitality, Tourism and Leisure Industry, Profit Through Productivity Report No. 1, University of Surrey, Guilford.

Johannisson, B. (2000), Networking and entrepreneurial growth, in: Sexton D.L. and Landstrom, H. (eds) *The Blackwell Handbook of Entrepreneurship,* Blackwell, Oxford.

Johannisson, B. and Nilsson, A. (1989), 'Community entrepreneurs: networking for local development', *Entrepreneurship & Regional Development*, 1, 3-19.

Kienzle, R. and Shadur, M. (1997), 'Developments in business networks in East Asia', *Management Decision,* 35, 1, 23-32.

Lerner, M.,and Haber, S. (2000), 'Performance factors of small tourism ventures: the interface or tourism, entrepreneurship and the environment', *Journal of Business Venturing*, 16, 77-100

Lynch, P.A. (2000), 'Networking in homestay sector', *The Service Industry Journal,* 20, 3, 95-116.

Leslie, D., and McAleenan, M (1990), 'Marketing hotels, tourism and Northern Ireland', *Tourism Management,* 11, 1, 6-10.

Lowe, A. (1988), 'Small hotel survival – an inductive approach, International Journal of Hospitality Management', 7, 3, 197-223.

Morrison, A., Breen, J., and Ali, S. (2003), 'Small business growth: intention, ability and opportunity', *Journal of Small Business Management,* 41, 4, 417-425.

Medina-Munoz, D., and Garcia-Falcon, J. M. (2000), 'Successful relationships between hotels and agencies, *Annals of Tourism Research,* 27, 3, 737-762.

Mitchell, J.C. (1973), Networks, norms and institutions, in: Boissevain, J. and Mitchell, J.C. (eds), *Network analysis: studies in human interaction,* Mouton & Co, The Hague.

MOCAT (2004), 'Direktori Hotel', Ministry of Culture, Arts and Tourism, http://www.mocat.gov.my/hotel.cfm accessed 25May 2004.

Morrison, A. (1996), 'Guest houses and small hotels', in P. Jones (ed.), *Introduction to Hospitality Operations,* London: Cassell, 73-85.

Morrison, A. (1998), 'Small firm co-operative marketing in a peripheral tourism region', *International Journal of Contemporary Hospitality Management,* 10, 5, 191-197.

Morrison, A., Lynch, P. and Johns, N. (2002), *International Networks: scoping study key findings*, Scottish Enterprise Network, Glasgow.

Morrison, A., and Thomas, R. (1999), 'The future of small firms in the hospitality industry', *International Journal of Contemporary Hospitality Management,* 11, 4, 148-154.

O'Donnell, A., Gilmore, A., Cummins, D. and Carson, D. (2001), 'The network construct in entrepreneurship research: a review and critique', *Management Decision,* 39, 1, 749-760.

Page, S.J., Forer, P., and Lawton, G.R. (1999), 'Small business development and tourism: *terra incognita?*', *Tourism Management*, 20, 435-459

Pavlovich, K. (2003), 'The evolution and transformation of a tourism destination network: the Waitomo Caves, New Zealand', *Tourism Management*, 24, 203- 216.

Perry, M. (1999), *Small firm and network economies*, Routledge, London.

Quinn, U., Larlour, R., and McQillan, N. (1992), 'The small firm in the hospitality industry', *International Journal of Contemporary Hospitality Management,* 4, 1, 11-14.

Ram, M. (1994), 'Unravelling social networks in ethnic minority firms', *International Small Business Journal,* 12, 3.

Rowley, G. and Purcell, K. (2001), ' As cooks go, she went'*: is labour churn inevitable?', *Hospitality Management*, 20, 163- 185.

Shaw, E. (1997), The impact which social networks have upon the development of small professional business service firms, Unpublished PhD thesis, University of Glasgow

Staber, U. (1998), 'Inter-firm co-operation and competition in industrial districts', *Organization Studies*, 19, 4, 701-724.

Szarka, J. (1990), 'Networking and small firms', *International Small Business Journal,* 8, 2, 10-21.

Szivas, E. (2001), 'Entrance into tourism entrepreneurship: a UK case study', *Tourism and Hospitality Research*, 3,2: 173-172.

Telfer, D.J. (2001), 'Strategic alliances along the Niagara Wine Route', *Tourism Management*, 22, 21-30.

Tinsley, R. and Lynch, P. (2001), 'Small tourism business networks and destination development', *Hospitality Management*, 20, 367-378

Walsh, K. (2003), 'Qualitative research: advancing the science and practice in hospitality', *Cornell Hotel and Restaurant Administration Quarterly*, April, 366-374

Yin, R. K. (1994), *Case study research: design and methods, 2nd ed.*, Sage Publications, Thousands Oaks

Contemporary Environment and its Impact on Malaysian Tourism

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ABSTRACT

Tourism is an important sector to generate economic growth in Malaysia. Over the last decade, Malaysia has become one of the popular tourist destinations and has experienced significant growth in its tourism industry. Tourism has helped to drive Malaysian economic growth by offering wide-range opportunities in employment, foreign exchange earnings and foreign investments. However, the industry is hugely depended on current world's environment and economic climate. The environment occurred were segregated into two categories; terrorism and contagious outbreaks, namely, the Twin Tower, World Trade Centre Tragedy (September 11, 2001), Bali Blasting (October 12, 2002) and the contagion of SARS (March 13, 2003), the Iraq War (March 19, 2003), the JWW Marriot Hotel Bombing in Jakarta (August 5, 2003), the Avian Influenza (December 12, 2003) and torching of schools (January 4, 2004) were posed as critical threats to the famous industry. Thus, the purpose of this paper is to examine the effect of the mentioned contemporary environment to the industry performance in terms of tourist arrivals, hotel occupancy rate and tourist receipts or revenues in Malaysia.

INTRODUCTION

Nowadays, tourism has emerged as one of important means to generate incomes for Malaysian economy. Overall, the industry contributed about 14.9%[1] from total Gross Domestic Products (8MP). Malaysia has promoted its multifaceted tourism products as the best destination for relaxation, shopping, education, health, major events and appreciation of culture, heritage, nature and agriculture. Among the products have been the creation of hill and island resorts, theme parks, eco-tourism, agro-tourism and cultural and heritage tourism. To illustrate, tourist arrivals, in average, increased at 6.5 percent per annum from 1996 until 2000. Most tourists came from ASEAN countries, Japan, China and Taiwan. Furthermore, numbers of tourism receipts, hotel occupancy rate and employment in the tourism industry have increased. Foreign exchange earnings and foreign and local investments augmented, as well.

Generally, this service industry has boomed in the last five years. In 2000, the industry brought revenues to the country totaling RM 31,081 millions compared to RM25,304 millions in 1995, indicating a tremendous increase of 18.6 percent (8MP). Unfortunately, the tourism industry was hugely affected by unavoidable environment, that were haze, Nipah and Coxsackie virus epidemics and also Asian financial crisis, which took place in 1997 and 1998.

Thus, we can consider the tourism industry as 'environment-dependent'. My point being, any unfavorable world's surrounding and environment will most likely bring negative effect toward our tourism industry. Terrorism and contagious pandemic have been seen as two major factors that have hindered the tourism industry in Malaysia. In fact, The Twin Tower, World Trade Centre Tragedy (September 11, 2001), Bali Blasting (October 12, 2002), the contagion of Phenomenal Epidemic (SARS) on (March 13, 2003), the Iraq War (March 19, 2003), the JW Marriot Hotel bombing in Jakarta (August 5, 2003), the outbreak of avian influenza or bird flu (December 12, 2003) and schools burned down in Thailand (January 4, 2004) were perceived to bring hazardous results in the popular service industry in Malaysia. Therefore, this paper will examine the impact of identified contemporary environment on the potential of Malaysian tourism in the following perspectives, in particular, tourist arrivals, hotel occupancy rate and tourist receipts or revenues.

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[1] The number included wholesale & retail trade, hotels & restaurants.

Syncronized Event Occurrences

The occurrences of contemporary environment were divided into two vital categories that were, terrorism and contagious outbreaks. The major events happened in the first category consisted of Twin Tower, World Trade Centre Tragedy (September 11, 2001), Bali Blasting (October 12, 2002), the Iraq War (March 19, 2003), the JW Marriot Hotel bombing in Jakarta (August 5, 2003) and torching of 20 schools in Tanyongmat, Southern Thailand (January 4, 2004). With the exception to the Iraq War, which intended to fight against Iraqi leaders, all those events were executed by Muslim terrorists, known as Al-Qaeda and Jemaah Islamiah. The situations led to hatred and misconception among Non-Muslim community all over the world pertaining to Muslim community. Since Malaysia is a Muslim country, the misleading propaganda, 'all Muslims are terrorists' has affected its tourism industry.

Meanwhile, contagious outbreaks, namely, Severe Acute Respiratory Syndrome (SARS), started in mid-November, 2002 (Guangdong, Southern Province of China) and avian influenza or bird flu started in 1997 (Hong Kong), have exacerbated the situation. The contagion of SARS since its first appearance outside Guangdong on March 13, 2003, has spread to many countries other than China, especially Hong Kong, Taiwan and Singapore. According to World Health Organization (WHO), SARS, a dangerous type of pneumonia, has become a virulent disease, where it has killed 916 people and infected 8,099 people worldwide, mainly China by January 8, 2004 (FEER, Feb.12, 2004).

Previously, avian influenza outbreak occurred in Hong Kong in 1997 and 2001. Later, the epidemic stroked Netherlands and Hong Kong in Feb 2003, where it infected 82 people and 2 people died, respectively (FEER, Jan. 29, 2004). The prevalent outbreak spread to South Korea on December 12, 2003, where detection of the pandemic was found in Vietnam's poultry led to massive culling of thousands of chickens. Furthermore, those who had serious contact with infected chickens were exposed to the disease that could cause death.

Therefore, both categories, either directly or indirectly, have influenced the service industry in Malaysia. The next section will give support to purpose of this paper that is to show that negative climate will result in the deterioration in the Malaysian tourism industry.

CONTEMPORARY ENVIRONMENT CONSEQUENCES TOWARD TOURISM INDUSTRY

Tourism industry is largely depended on contemporary world's climate. The Twin Tower, World Trade Centre Tragedy (September 11, 2001), Bali Blasting (October 12, 2002), the contagion of Phenomenal Epidemic (SARS) on (March 13, 2003), the Iraq War (March 19, 2003), the JW Marriot Hotel bombing in Jakarta (August 5, 2003), the outbreak of bird flu (December 12, 2003) and schools burned down in Thailand (January 4, 2004) have posed as critical threats to this popular service industry in Malaysia. This section will brief about the impact of tourism industry in Malaysia by looking at three main aspects, namely, tourist arrivals, hotel occupancy rate and tourism receipts or revenues.

Tourist Arrival

Bird flu epidemic, also known as avian influenza outbreak in Asian (Seoul, Hanoi, Hong Kong and Thailand), which became serious in December 12, 2003, continued to pose as a significant peril to human health and economic activities in the region. The epidemic caused by H5N1 strain virus at chicken and duck had killed more than 30 people in those particular countries. Furthermore, the riots occurred in Thailand resulted in the torching of 20 schools on January 4, 2004 also instilled fear among tourists to visit Malaysia. Due to their awareness concerning health and safety, and also their constant fear of the contagion effect and terrorism, tourists avoided to travel to Asian countries including Malaysia. Even though Malaysia has known to be 'disease-free' and harmless, tourist arrivals in Malaysia decreased about 10 percent from 1,408,181 in January 2004 to 1,266,886 in April 2004. However, the bombing of JW Marriot Hotel, Jakarta did not largely affect the arrivals among tourists to Malaysia. The number of tourists coming to Malaysia multiplied from 826,234 in August, 2003 to 994,858 in October, 2003. It showed that tourists had their confidence in Malaysian security system with they believed that Malaysia was free from any terrorist activities.

Unfortunately, the Iraq War on March 19, 2003 coincided with the first incidence of a deadly pneumonia (SARS) worldwide on the March 13, 2003 caused visitor arrivals in Malaysia in early 2003 deteriorated from 1,070,428 in January, 2003 to merely 459, 374 in April 2003. Tourist arrivals from Asian countries fell by 25.1 percent, EAST ASIA by 1.87 percent, WEST ASIA by 31.5 percent, United States by 16.3 percent and Australia by 30.9 percent. This was due to the effect of both climate, the Iraq war concurred by SARS epidemic, which

had spread to other ASIAN countries besides China, such as Hong Kong, Singapore and Taiwan. Both events put the tourism sector suffered again after the recovery from Bali blast.

In 2002, Malaysia recorded very impressive arrivals with 13.2 million tourists, which denoted an increase of 86.2 percent over the 1996 figure of simply 7.1 million tourists. Bali blasting on October 12, 2002 did not really affect Malaysian tourism because ASIAN countries were major tourist generating markets, consisted of 48 percent from total tourism in Malaysia. The number of arrivals from Brunei increased from 19,505 to 33,963 in October and December, respectively, Singapore rose from 514,586 to 773,087, Thailand rose from 99,175 to 109,672 and Indonesia rose from 55,705 to 81,732, in the same period, respectively.

However, visitor arrivals from other regions plunged in October and November 2002 but recovered in December 2002. For instance, due to Bali blasting, tourist arrivals from the United States in October-December dropped from 12,690 to just 8,746, United Kingdom dropped from 18,879 to 15,198, Australia dropped from 21,397 to 11,485, China dropped from 42,858 to 40,224 and Japan dropped from 30,980 to 20,580, in October and November, respectively. The reason behind the reduction in tourist arrivals from those countries was that ASIAN countries including Malaysia were marked as terrorist places. The 'terrorist' labeling scared many tourists and made them fear of flying. Thus, the number of tourists coming to Malaysia for vacation, visiting and business purposes dropped.

Table 1: Tourist Arrivals to Malaysia, 1999-2004

COUNTRY OF RESIDENT	1999	2000	2001	2002	2003	2004 (JAN-MAY)
SINGAPORE	1,440,653	1,952,562	6,951,594	7,547,761	5,922,306	3,996,454
THAILAND	230,409	348,252	1,018,797	1,166,937	1,152,296	599,866
INDONESIA	139,791	193,165	777,449	769,128	621,651	304,164
BRUNEI	107,114	80,027	309,529	256,952	215,634	219,834
CHINA	101,016	247,892	453,246	557,647	350,597	244,105
JAPAN	111,762	227,626	397,639	354,563	213,527	121,853
TAIWAN	51,301	95,902	249,811	209,706	137,419	73,355
HONG KONG	33,400	44,841	144,611	116,409	72,027	39,314
SOUTH KOREA	9,544	33,872	66,343	64,301	46,246	25,586
INDIA	17,585	63,258	143,513	183,360	145,153	68,369
WEST ASIA	5,951	15,111	114,776	131,779	80,216	29,865
SAUDI ARABIA	2,864	5,658	39,957	45,007	20,077	7,908
TURKEY	1,244	4,945	6,392	5,742	5,191	2,463
UAE	587	761	13,762	14,124	6,047	2,569
JORDAN	-	0	3,688	3,611	2,143	828
KUWAIT	-	0	7,458	10,470	3,599	1,695
LEBANON	-	0	4,413	5,336	7,787	3,914
SYRIA	-	0	18,205	21,109	16,776	3,815
OMAN	-	0	7,284	8,432	5,703	1,976
CANADA	11,001	29,580	38,935	34,996	26,978	14,898
U.S.A	34,141	83,554	145,827	127,920	131,071	62,470
AUSTRALIA	57,867	118,628	222,340	193,794	144,507	82,741
UNITED KINGDOM	73,748	127,712	262,423	239,294	125,569	85,956
DENMARK	1,589	4,807	19,770	17,297	13,434	5,419
FINLAND	3,104	13,070	15,284	12,908	11,041	4,819
NORWAY	3,010	8,028	12,530	11,589	7,856	4,869
SWEDEN	11,013	28,711	35,053	29,044	23,560	13,995
GERMANY	26,117	45,544	70,401	54,645	41,145	24,527
RUSSIA	748	3,347	4,276	5,067	5,235	3,985
ITALY	6,989	20,302	20,636	16,805	12,872	8,194
FRANCE	11,753	18,353	32,922	27,434	23,845	14,011
SOUTH AFRICA	6,513	7,417	20,766	13,720	12,577	7,536
OTHERS	219,814	254,398	1,246,602	1,148,954	1,040,153	451,706
GRAND TOTAL	2,715,933	4,065,959	12,775,073	13,292,010	10,576,915	6,507,891

Source: Immigration Department of Malaysia (KL)

Due to WTC attack on September 11, 2001, total tourist arrivals in Malaysia reduced from 927,206 in September to 596,202 in October and 759,321 in November. This was due to negative tourists' perceptions toward Muslims countries including Malaysia. Because of the erroneous belief, many hotel and transport reservations were cancelled. Conversely, concerted efforts from the Malaysian government to regain its reputation as a renowned tourist destination, tourist arrivals in Malaysia began to rise. In December 2001, visitor arrivals increased to 975,771 compared to 596,202 in October 2001. The number of arrivals among tourists from the United States increased by 15.3 percent, United Kingdom increased by 2.76 percent, China increased by 22.5 percent, Japan increased by 14.7 percent and Canada increased by 24.9 percent, October and December, 2001, respectively.

Hotel Occupancy Rate

Occupancy rate refers to the relationship between available capacity and the extent to which it is used. This rate may refer either to the usage of rooms or of beds. Occupancy rate is based on the number of overnight stays of both resident and non-resident tourists.

In Malaysia, the average occupancy rate showed 4.6 percent decrease, from 57.9 percent in 2002 to 53.3 percent in 2003. This was due to contagious epidemic and terrorist activities by the end of 2003 made tourists fear of traveling to Malaysia and other Asian countries.

In March 19, 2003, Baghdad bombing by the United States started the Iraq War and left enormous impact on the international tourism industry. Tourists became fearful of flying that led to negative growth in the service industry especially in hotel and transportation sectors. As a result, many hotel and transportation bookings were cancelled in 2003 because tourists felt insecure to travel abroad. The average occupancy rate of hotels throughout Malaysia decreased, by 10.8 percent to 46.4 percent, April through June, 2003, compared to the same period, in 2002. Most of the popular hotel destinations in Malaysia showed heavy downturn during the attack. For instance, the average hotel occupancy rate in Kuala Lumpur decreased by 9.8 percent, Desaru by 20.7 percent, Taman Negara by 27.1 percent, Tasik Kenyir by 13.7 percent, Langkawi by 3.2 percent, Genting Highlands by 16.3 percent and Kuching by 22.6 percent, April through June, 2003 compared to the same period in 2002, respectively.

Unfortunately, the outbreak of SARS worsened the hotel performance with average occupancy rate fell to 46.4 percent, in April-June, 2003 from 49.8 percent, in January-March, 2003. Health consciousness impeded international tourists from visiting and traveling to Malaysia. Even though Malaysia was free from the epidemic, it also felt the heat of SARS. As an example, when the neighboring country, Singapore was listed as one of the affected countries with 206 SARS cases, tourists immediately shunned away from Malaysia and other Asian countries as suitable vacation destination.

During the Bali blasting on October 12, 2002, hotel performance once again aggravated. As expected, the decrease in tourist arrivals due to Bali blast, also made the hotel industry suffered. The average hotel occupancy rate in Malaysia was recorded at 57.2 percent, in October to December, 2003, dropped by 4.6 percent, from July to October, 2003. The fallout after the bombing painfully indicated that Asian countries including Malaysia had great reliance on tourism industry. However, Bali blasting did not really affected Malaysia tourism because Asian countries became the major tourist generating markets, comprising about 48 percent of total tourism in Malaysia.

Due to September 11 incident, economic growth in the first half of 2002 slumped. Hotel demand from key feeder markets such as Europe, Japan and US declined substantially. Any gains made during the first nine month of 2001 were largely diluted by the losses incurred during the last three months of 2001. Although the average hotel occupancy rate in 2001 rose from 57.7 percent in 2000 to 58.6 percent in 2001, most hotels showed declining rate in terms of occupancy. Obviously, the September 11 incident hurt Malaysian hotel performance since many people instilled their fear of flying.

Table 2: Hotel Occupancy Rate (average) by Locality, Malaysia, 1999 - 2003

LOCALITY	1999	2000	2001	2002	2003
KUALA LUMPUR	52.7	60.9	61.2	62.9	60.5
PETALING JAYA	57	78.3	61	66.9	61.3
SUBANG	47.1	58	53.6	55.8	62.3
SHAH ALAM	38.4	54.6	53.6	52.9	59.7
KAJANG	54.2	61.1	54.2	56.8	56.5
SEPANG	53.9	67.5	57.5	62.5	57.9
SERI KEMBANGAN	55.3	53.7	57.1	61.9	46.6
MALACCA	38.5	47.1	50.1	55	49.6
SEREMBAN	56.9	60.2	56.9	57.8	52.4
PORT DICKSON	36	43.8	52.5	55.6	39.4
JOHOR BAHRU	56.8	61.9	58.1	60.7	56.4
DESARU	34.9	31.4	34.1	30.5	31.4
MERSING	33.4	33.8	42.8	39.2	46.7
IPOH	52.8	54.2	56.4	57.1	55.7
LUMUT	43.3	35.8	40.3	41.8	45.7
ALOR SETAR	48.4	52.1	49.5	60.6	57.5
SUNGAI PETANI	55.3	51.2	57.4	56.9	54.2
KANGAR	43.8	48.6	54.8	67.5	61.5
PENANG	59.6	60	58.2	52.4	47.3
KUANTAN	45	55	56.8	63.5	58.6
CHERATING	47.3	56.9	53.9	48.6	54.4
TAMAN NEGARA	49.1	55.9	44	49.9	38.5
KUALA LIPIS	32.2	39.4	46.7	44.7	44.4
KUALA TERENGGANU	40.6	46.5	47	43.4	47.8
DUNGUN	40	39.1	36.7	29.8	33.2
MARANG	26.4	49.6	11.7	34.2	29
TASIK KENYIR	40.1	25.2	22.7	29.3	26.7
KOTA BHARU	44.2	44.9	36.3	40.8	37.2
LANGKAWI ISLAND	51.9	60.6	60	53.8	53.1
PANGKOR ISLAND	38	38.1	40.5	45.9	33.8
TIOMAN ISLAND	39.3	41.7	52.5	43.3	43.2
REDANG ISLAND	42.5	12.3	62.3	45.3	43
GENTING HIGHLANDS	85	84.3	89.1	81.4	75.8
CAMERON HIGHLANDS	30.3	33.8	37	37.5	36.8
FRASER HILLS	23.4	27.6	27.5	35.6	30.5
PENINSULAR MALAYSIA	52	58	59.5	58	53.1
KUCHING	53	53	56.9	59.5	52.9
SANTUBONG	27.8	35.7	35.8	35.2	24.8
MIRI	45.9	45.3	48.6	59.8	56.6
KOTA KINABALU	59.1	67.5	64.1	62.5	60.4
SANDAKAN	50	59.2	47.9	51.8	56.8
LABUAN	41.7	48.2	41.5	44.7	48.5
MALAYSIA	51.7	57.7	58.6	57.9	53.3

Source: Malaysian of Tourism

Thus, the global economic downturns, such as September 11 tragedy, Bali blast, Iraq war and SARS epidemic had affected hotel performance in Malaysia. Most of the hotels in Malaysia faced declining rate in occupancy, revenues and average length of stay.

Tourism Receipts or Revenues

Data on tourism receipts, tourism revenues or tourism expenditures have been obtained from the item *'travel receipt'* of the Balance of Payment of each country and corresponds with the *'expenditure of non-resident visitors'* within economic activities of the country.

In Malaysia, tourist receipts recorded an increase of 88.9 percent from RM1,179.9 million in 1995 to RM24,221.5 million in 2001. Due to terrorist attack, in 2001, tourist receipts was RM24,221.5, demonstrated an increase of 39.4 percent from the previous year. 'Visit Malaysia' campaign was beneficial in improving tourist arrivals by 25 percent, which in turn, increased tourist receipts. Unfortunately, the Bali blast, on October 12, 2002, slowed down the growth of tourism revenues. In 2002, tourist receipts only grew 6.4 percent to RM25,781.1 million compared to a growth of 39.4 percent in 2001. The positive growth in tourist arrivals nine months before the bombing, escalated 23.3 percent with 1,029,120 tourist arrivals in September 2002 , helped to maintain a positive growth in tourism revenues.

The effort of Tourism Ministry in Malaysia had contributed to encourage tourist arrivals to Malaysia in generating revenues for Malaysian tourism. The average per diem expenditure of tourists increased by 20.5 percent from RM255.90 in 1995 to RM308.36 in 2000, while the average length of stay increased from 4.8 night in 1995 to 5.5 night in 2000. With the target set for 14.2 million tourist arrivals in 2005, a total receipts of RM29.5 billion is expected for the same year. It has showed that tourism in Malaysia is able to maintain its growth even in the bad climate due to contagion of epidemic and terrorist incidents. Asian countries as tourist generating markets and domestic tourism have helped boosting the tourism industry in Malaysia.

Table 3: Tourism Receipts in Malaysia from 1999-2003

Year	Tourist Arrivals (millions)	Total (RM Million)	Tourist	Expenditure
1999	7.93	12,321.3		
2000	10.22	17,335.4		
2001	12.78	24,221.5		
2002	13.29	25,781.1		
2003	10.58	21,291.1		

Source: Malaysian Tourism Department

CONCLUDING REMARKS

Undoubtedly, tourism is indeed a vital sector to foster economic growth in Malaysia. Nevertheless, the industry is very much depended on contemporary environment and the world economic climate. The poignant tragedy of World Trade Centre, Bali Blasting, the contagion of Phenomenal Epidemic (SARS), the Iraq War, bird flu pandemic and torching of schools have caused quite severe impact to the industry in Malaysia. Therefore, the government has implemented full efforts to ensure the tourism sector make positive progress.

The objective of the tourism sector is to achieve sustainable growth in order to realize its full potential as one of major engine of growth to the country. The physical environment and cultural heritage are two core attractions of tourism products that must be conserved. Besides, intensive promotions, advertising, campaigns and information disseminations have been done to encourage more outbound tourists. In this regard, aggressive promotional activities were carried out under the theme of "Malaysia Truly Asia" to promote the unique blend of natural beauty and a rich diversification of culture, traditions, history and lifestyles of the various ethnics in Malaysia.

Furthermore, in order to attract tourists coming to Malaysia, it is essential to promote tourism products and identify new products to capture a bigger share of the world tourism market. The tourism products, such as hill and island resorts, shopping destination, thematic events, sports and recreation tourism, cruise tourism, eco-tourism, home stay programs and cultural and heritage tourism are being introduced and encouraged. Integrated and coordinated marketing efforts by both the government and private sectors are also being undertaken to ensure the success in the tourism industry. The private sector investment increased by 107% from RM8.8 billion to RM18.82 billion in 2000.

Moreover, domestic tourism will enable Malaysia to sustain its growth. Therefore, the intensive domestic campaign has been done to encourage more domestic traveling. In this regard, *'Cuti-Cuti Malaysia'* theme performs persistent promotional activities to encourage the domestic traveling and to reduce currency outflows.

The rapid improvement and construction in the transportation system will provide easier access to tourist destinations.

In addition, the Malaysian government gives its priority towards human capital investment in achieving competence and professionalism to ensure the competitiveness of the tourism industry. The National Tourism Human Resources Development Council (NTHRDC) continues to supervise and coordinate training development activities for the tourism industry. Besides, the training of tour guides will be upgraded to improve their competency level, provide better services and be able to converse in foreign languages.

Projecting a year round carnival atmosphere such as Merdeka celebration, Colors of Malaysia, Mega Sale, Formula One Grand Prix, International Go-Kart Race, Le Tour De Langkawi and others will promote tourists to stay longer, spending more and do repeated visits to Malaysia. By facilitating and increasing accessibility to the tourist destinations will make tourists to feel at ease and convenience to spend their time in Malaysia.

Lastly, security system needs to be improved so as to ensure the safety of visitors, especially after series of incidents occurred globally, by intensifying the cooperation among law-enforcement agencies within allied countries and taking appropriate measures. Concerning the exposure of deadly disease, better coordination and stronger actions are needed to curb the spread of epidemic, such as SARS and avian influenza.

REFERENCES

Abraham Pizam & Aliza Fleischer (2002). "Severity versus Frequency of Acts of Terrorism: Which has a Larger Impact on Tourism Demand". *Journal of Travel Research.* 40: 337-339.

Dirk Belau (2003), *"The Impact of the 2001-2002 crisis on The Hotel and Tourism Industry", International Labour Organization Report.* January 2003.

Far Eastern Economic Review (2003), *Topics on Tourism Issues*, various issues.

Far Eastern Economic Review (2004), *Topics on Tourism Issues*, various issues.

Malaysia. (2002). *Immigration Department of Malaysia Report 2002.* Kuala Lumpur.

Malaysia. (2002). *Department of Tourism Statistics.* Kuala Lumpur.

Malaysia. (2001). *Eighth Malaysia Plan 2001-2005.* Kuala Lumpur.Ray Pine, Andrew Chan & Paul Leung. (1998). The Current and Future Impact of Asia's Economic Downturn the Region's Hospitality Industry. *International Journal of Contemporary Hospitality Management* 10: 252-256.Susan, S. (2002). "One Year On Reflections on September 11th and the 'War on Terrorism': Regulating New York City's Visitors in the Aftermath of September 11[th"]. *International Journal of Urban and Regional Research* 26.3: 591-595. World Tourism Organization. (1996). *International arrivals to top 1 billion by 2010.* Retrieved June 18, 1996, from http:/ /www.world-tourism.org/topnews.htm. World Tourism Organization (1997). *Tourism Market Trends: East Asia and the Pacific*, Madrid: World Tourism Organization. World Tourism Organization (2000). WTO Tourism Statistics Database [Online]. Available: http:/ /www.world-tourism.org/esta/ statserv.htm. World Tourism Organization. (2001). *Tourism After 11 September 2001: Analysis, Remedial Actions and Prospects.* Madrid: World Tourism Organization. No.18.

Xiaoli Han & Bingsong Fang. (1997). Measuring the Size of Tourism and its Impact in An Economy [A]. *Statistical Journal of the UN Economic Commission for Europe* 1.

Gap Analysis of Tourists' Perceptions Towards the Service Quality of the Recreational Facilities and Services at Tasik Kenyir, Terengganu, Malaysia

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ABSTRACT

A paradise where nature is at its very best, Tasik Kenyir in Terengganu is the perfect place for an adventure holiday. Nevertheless many issues regarding the service quality of the many tourism organisations operating at Tasik Kenyir are not fully address. As such this paper will examine the importance of the service quality to the survival of Tasik Kenyir as one of the major tourist destination in Malaysia. The focus of the paper is to examine the gaps between the expectations of the tourists and their perceptions of the actual service experience received from the establishment offering recreational services at Tasik Kenyir by using the SERVQUAL model proposed by Parasuraman et al. (1988). The Wilcoxon Signed Ranks test was used to evaluate the distribution of the gaps between expectations and the perceptions of tourists. The findings indicated there was a significant difference between the expectation and perception of tourists towards the service quality offered by the organisations operating at Tasik Kenyir. In addition, a correlation analysis was also conducted between five service quality dimensions and the overall satisfaction level of tourists. Significant and positively linear relationships were observed despite the moderate and low correlations between the variables.
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INTRODUCTION

The tourism industry is a booming industry in Malaysia. Within the last decade, tremendous growth in this sector has made the industry the second most important economic sector in Malaysia's gross domestic product. Presently, tourism brings in RM24.4 billion (2001) in foreign exchange and provides quantified economic opportunities in the form of investments, business creation, physical development and job employment within the country. Tourism industry is an interrelated industry with strong linkages to other sectors such as accommodation (hotels, resorts, inns, rest houses etc); transportation (airlines, coach, car rental companies); tourism attractions (theme parks, national parks, museums, lakes, beaches etc); events (conventions, exhibitions, trade shows, etc); travel trade (advertising agencies, tourism educators, information centres, private and public tourism promotion and marketing offices); cruise lines, entertainment and restaurants (Minister of Culture, Arts and Tourism Malaysia, 2004). This shows that any improvements in the industry has to take a holistic approach since any deficiency in any one of the sectors would ruin and spoil an otherwise wonderful experience for the tourists. As such, the industry must therefore be concern with achieving and maintaining a consistent level of service quality in both their tourism products and systems of delivery.

Service Quality in Tourism Industry

The public is increasingly becoming more sophisticated in respect of standards which are expected, and more concerns about the products and services which do not meet their expectations and requirements in terms of choice and quality (O'Neill and Black, 1996). As a management concept, quality can be defined as the organisation's ability to produce and deliver what is demanded in a manner, which consistently meets consumer demand. Berry et al. (1992) adds that quality is the degree of excellence intended, and the control of variability in achieving that excellence, in meeting the customer's requirements. The issue then is not solely how well the service provider design its tourism products or services, but also of ensuring that both products and service conforms, meets or exceeds the needs and expectations of the customer in a consistent manner.

In the tourism industry, the level of guest satisfaction that the service providers offer its guests has to be the most important factor that makes an almost direct impact on its bottom line. When competing for the consumer's disposable income, the management needs to be aware of quality issues. Since quality relates to consumer's needs and expectations, the standards adopted by the industry must be acceptable by its customers. Without good service and satisfied customers, the tourism industry will ultimately fail. Therefore, in meeting the customer needs and expectations, those who are involved in the tourism industry need to grow and innovate all the time in order to add value in meeting customers' requirements. The focus is not only on providing quality

products, but to provide added value service and solutions. Service provider such as tour operators, tourists guide and hotel managers should be looking for new products and services, as well as assessing the emerging new trends in the tourism and hospitality industry, to help them better cater to their customers' needs.

Importance of Quality

Quality is defined as 'the totality of features and characteristics of a product or service that bear on its ability to satisfy a given needs'. The modern concept of quality is 'fitness for purpose'. This concept shifts the evaluation of quality from the provider to the consumer. Therefore, the provider has to be aware of the consumers' attitudes and perspectives in order to be able to provide quality products and services (Jones, 1989). Similarly, many authors have shown their agreement with the modern concept of quality. Owen and Malkovich (1995) define quality as about meeting the needs and exceeding the expectations of customers. Oakland (1989) stated that quality is simply meeting the requirements. Feigenbaum (1983), on the other hand, defines quality as 'the total composite product and service characteristics of marketing, engineering, manufacture, and maintenance through which the product and service in use will meet the expectation by the customers.' From these definitions, we can conclude that the basic thing about quality is satisfying the customers. Therefore, quality product or service should possess certain characteristics or features that have the ability to satisfy the customers by meeting their needs or requirements. However, those needs and requirements are unique and different form one customer to the others, thus, leaving the challenge to producers of products or services to understand true customer needs and to translate these into products or services that will satisfy those needs.

Service quality is important to marketers because a customer's evaluation of service quality and the resulting level of satisfaction are thought to determine the likelihood of repurchase and ultimately affect bottom-line measures of business success (Iacobucci et al, 1994). It is important for management to understand what service quality consists of, its definition, and how it can be measured. If management is to take action to improve quality, a clear conception of quality is of great value. A vague slogan for "customer contact employees" to "improve quality" may have each employee acting on his/her notion of what quality is. It is likely to be much more effective to tell a service contact employee what specific attributes service quality includes, such as responsiveness. Management can say, if we can improve our responsiveness, quality will increase (Asubonteng, 1996).

Service Quality and Customer Satisfaction

Customers have expectations. If the expectations are not met, they become dissatisfied. The only way for the organization to keep a high level of customer satisfaction and still operate efficiently is to master the art of an optimum level of performance that ensures that expectations are consistently met (Augustyn & Ho, 1998). In addition numerous research findings showed that customer's satisfaction and loyalty are influenced by service quality (Sirohi et al., 1998; Zeithaml et al., 1990). Sirohi et al. (1998) found that customer loyalty, measured by the intent to continue shopping, increase purchases and recommend the store, depend upon service quality and the customer's perceptions of the quality of the good sold. This indicates that service quality and the customer's perceptions play an important role in satisfying the customer and keeping them coming to the premises of the operators. These findings are further enhanced by the work done by Zeithaml et al. (1996) indicating that customer's loyalty or disloyalty towards an organization, are influenced by variability of service quality.

Measuring Service Quality
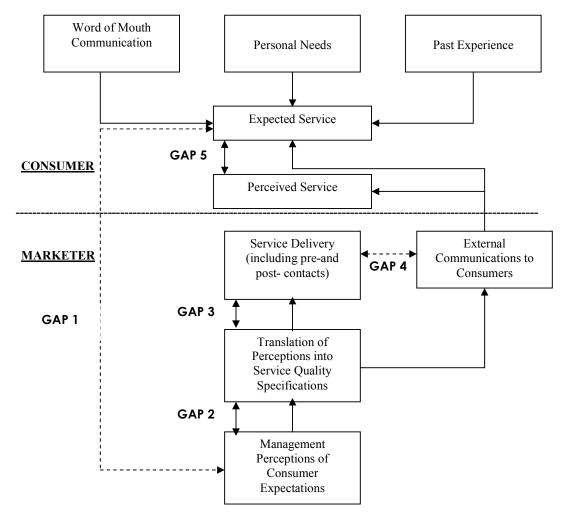
Service companies are beginning to grasp the lesson behind what the manufacturing companies learned in the past few decades; that quality does not improve unless it is measured (Sureshandar et al, 2001). Realising the importance of quality, a number of researchers have developed tools for measuring service quality. Parasuraman et al., (1985, 1988) and Zeithaml et al., (1985, 1990) developed a measure of service quality derived from data on a number of services.

The earlier work on this area yielded 10 dimensions of service quality that included tangibles, reliability, responsiveness, competence, courtesy, credibility, security, access, communication and understanding the customer. Later, this measure was refined and resulted in 22-item scale, called 'SERVQUAL'. It measures service quality based on five dimensions that are tangibility, reliability, responsiveness, assurance and empathy. The authors proposed that service quality can be measured by looking at the degree of discrepancy between customers' normative expectations for the service and their perceptions of the service performance.

Since its development, SERVQUAL has been widely used in a variety of industrial, commercial and non-profit settings. The studies include retailing, hotels, travel and tourism, car servicing, business school, higher education, hospitality, accounting firms, architectural services, recreational services, hospitals, airline catering, banking, and local government. The SERVQUAL model is best known for its definitions of gaps between

customers' expectations and perceptions. The five gaps, as defined by Parasuraman et al., (1985) are shown in figure 1.

Figure 1: The Service Quality Model

Source: Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1985), A Conceptual Model of Service Quality and its Implications for Future Research, *Journal of Marketing*, 49: 41-50.

This paper focuses only on Gap 5, which is the Satisfaction Gap. Gap 5 or the satisfaction gap is the discrepancy between customer's expected service and perception of the actual service delivered. Customer expectations are influenced by their own experience, those of others and the claims of the supplying organization (Rowley, 1998). There are, however, some factors, which are not really under the control of the service provider because external factors may be responsible for the creation of this gap (Augustyn & Ho, 1998). For example, personal problems of a customer may bias the expectation of the service.

Service Quality Dimension

According to Rowley (1998), service quality dimensions are those attributes that contribute to consumer expectations and perceptions of service quality. These are the attributes of the service that are important to the customer and contribute significantly to their quality assessment. Knowledge of these dimensions and the ability to measure them can help to yield an insight into more effective ways of improving service quality. Buttle (1996) reviewed that SERVQUAL is founded on the view that the customer's assessment of service quality is paramount. This assessment is conceptualised as a gap between what the customer expects by way of service quality from a class of service providers, and their evaluations of the performance of a particular service provider. Parasuraman, Zeithaml, and Berry (1985) in their early study of a conceptual model of service quality,

identifies ten criteria used by customers in developing their expectations and perceptions of service delivered. The later work on SERVQUAL by Parasuraman et al (1988) sought to develop a general instrument for measuring service quality. They identified five dimensions of service quality (three original and two combined dimensions). They suggested the following labels and concise definitions for the dimensions, which consist of:

i.   Tangibility: Physical facilities, equipment, and appearance of personnel
ii.   Reliability: Ability to perform the promised service dependably and accurately
iii.   Responsiveness: Willingness to help customers and provide prompt service
iv.   Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence
v.   Empathy: Caring individualised attention the firm provides its customers

The last two dimensions (assurance and empathy) contain items representing seven original dimensions that included communication, credibility, security, competence, courtesy, understanding/ knowing the customers and access. Relating these service quality dimensions with the service providers in the tourism industry, its' service possesses all the attributes of the service quality. In terms of tangibles, most hotels, resorts, eating places and tourist centres provide outstanding physical facilities, excellent equipment, and admirable appearance of personnel. The issue is how far does these physical attributes exceed or at par with the customers' expectations and perceptions.

The reliability of the service rendered by hotels, resorts, tour operators, tourist centres, and other service providers in the tourism services are known for its dependable service. Before being accepted as part of the work force, all staffs are required to undergo proper training in order to be able to perform the promised service dependably and accurately. The question is to what extent does this training corresponds with the customers' expectations and perceptions? And, is the reliability of the service rendered contributes to the customer satisfaction?

Referring to the third dimension of the service quality, all service personnel should respond promptly, confidently and efficiently to every guess inquiry or need. Actions should communicate competence and enthusiasm but not hastiness (Foster, 1993). Similarly, there is a need to investigate the level of responsiveness of the service providers whether it is compatible with the customers' expectations and perceptions and whether it leads to overall customer satisfaction. Service providers in the tourism industry are believed to deliver assurance in their services to customers. They are believed to possess adequate knowledge, courtesy and the ability to inspire trust and confidence among their customers. Again, we need to discover to what extent does this 'assurance' satisfies the customers' expectations and perceptions.

The last dimension of service quality is empathy. Employees or service providers are required to establish eye contact with the customers, maintain alert postures, give a warm smile, respond promptly, confidently and efficiently, and provide a personal touch to the customers (Foster, 1993). However, is this personalised attention by the employees adequate to promote customer satisfaction? These are all the questions that need to be answered by the relevant management staff in order to improve their service quality.

RESEARCH METHODOLOGY

The research is a descriptive study using survey sampling as its main research methods to gain information on the service delivery systems of agencies and companies operating and providing services to tourists at Tasik Kenyir, Terengganu. An estimated total of 350 respondents who are tourists, visiting Tasik Kenyir, were chosen. The tourists are those who have spent at least 24 hours at Tasik Kenyir. They were selected using purposive, convenience sampling. However the researchers were able to collect only 203 questionnaires using face-to-face interviews while the tourists themselves returned 73 questionnaires to one of the establishment operating at Tasik
Kenyir. Customers were given two sets of questionnaires that would reveal their expectation before receiving the services provided by the various business establishments (service providers) and their perception of the actual service received from the service providers. This provided information on the "before and after effect" of receiving the services at Tasik Kenyir. Data were also collected from secondary sources such as journals, books, magazines, newspaper and the Internet. Information gathered from the census and survey was processed using the SPSS software package.

OBJECTIVES OF THE STUDY

There are several objectives that the researcher hoped to achieve in the study. The objectives are:

i. Evaluation of the gaps between the expectations and perceptions of tourists towards the recreational facilities and services for each component in the service quality dimensions.

ii. To assess the correlation between the recreational facilities and services to the tourists overall satisfaction.

iii. To discover the ranking of important service features as perceived by tourists visiting Tasik Kenyir.

iv. To provide recommendations to the relevant authorities on ways to improve the service quality of service providers at Tasik Kenyir.

DATA ANALYSIS

Two main analyses were used to examine the gaps analysis. Descriptive analysis was used to look at differences of the mean value of all the components of the service quality dimensions. Since the variables (components in the service quality dimensions) do not exhibit a normal distribution, the Wilcoxon Signed Rank test was chosen for the second analysis. The test helps to identify whether there is any difference in the distribution of the expectations and perception s of tourists for each component in the service quality dimensions.

Descriptive Analysis

A 7-point Likert scale was used in the questionnaires and from the score; the mean values of both expectations and perceptions for each component in the service dimension were computed. The difference in mean values shows the overall gap of each component and the gap reveals that the perceptions of tourists are lower than their expectation for all components of the service quality dimensions. Results are shown in table 1.

Table 1: Gap and Mean Analysis of the Service Quality Dimensions

Service Quality Dimensions	Components	Expectations (E)	Perceptions (P)	Gaps (P-E)
Tangibility	Modern-looking equipments	5.6227	4.7143	-0.9084
	Appealing physical Facilities	5.6520	4.7647	-0.8873
	Neat Appearing Employees	5.4723	4.5055	-0.9668
	Appealing Materials Associated with the Service	5.7179	4.5424	-1.1755
Reliability	Providing Service as Promised	5.8162	4.6654	-1.1508
	Sincere Interests in Solving Customer' Problems	5.6691	4.7684	-0.9007
	Perform Services Right the First Time	5.7684	4.6259	-1.1425
	Provide Services at Time Promised	5.7243	4.6642	-1.0601
	Error-Free Records	5.5919	4.7154	-0.8765
Responsiveness	Customers Know When Service Will be Performed	5.6765	4.6384	-1.0381
	Providing Prompt Service	5.6952	4.7059	-0.9893
	Always Willing to Help Customers	5.7169	4.6015	-1.1154
	Never Busy to Responds to Customers Requests	5.5129	4.6642	-0.8487
Assurance	Instil Confidence in Customers	5.8235	4.6790	-1.1445
	Customers Feel Safe in Their Transactions	5.7970	4.9593	-0.844

	Consistently Courteous with Customers	5.8676	4.9742	-0.8934
	Knowledge to Answer Customer Questions	5.7306	4.8481	-0.8825
Empathy	Providing Individual Attention	5.5867	4.5092	-1.0775
	Convenient Operating Hours	5.5846	4.5609	-1.0237
	Provide Personal Attentions	5.5221	4.2546	-1.2675
	Having Customer's Best Interests at Hearts	5.7610	4.4391	-1.3219
	Understanding Specific Needs of Customers	5.6162	4.4945	-1.1217

Wilcoxon Signed Ranks Test

This non-parametric analysis was used since the variables do not exhibit a normal distribution pattern. A pair-sample analysis was conducted using the Wicoxon Signed Ranks Test. The Wilcoxon test allows the researcher to discover how many tourists had negative gaps (perceptions less than expectations), positive gaps (perceptions greater than expectations) or ties (Perceptions equal Expectations). It was discovered that a significant number of tourists experience negative gaps, where the actual services experienced by the tourists fell below their expectations. This is true for all the components under each service quality dimensions of the SERVQUAL model. Further test (Z test) shows that the difference between the types of gaps is significant as shown by the Asymptotic Significant value of less than 0.05. The significant value indicates that there is a significant difference between the high expectations and low perceptions of the tourists in the sampling frame. Results from the tests are depicted in table 2.

Table 2: Wilcoxon Signed Ranks Test Indicating the Number of Respondents with Different Gaps and Ties and its' Significant Value

Service Dimension	Components	Negative Gaps	Positive Gaps	Ties	Asymp.Sig (2-tailed)
		Number of Respondents (Tourists)			
Tangibility	Modern- Looking Equipments	145	62	65	0.000
	Appealing Physical Facilities	149	57	65	0.000
	Neat Appearing Employees	144	56	69	0.000
	Appealing Materials Associated with the Service	158	45	68	0.000
Reliability	Providing Service as Promised	157	47	68	0.000
	Sincere Interests in Solving Customer' Problems	149	56	67	0.000
	Perform Services Right the First Time	149	49	72	0.000
	Provide Services at Time Promised	152	45	74	0.000
	Error-Free Records	141	45	81	0.000
Responsiveness	Customers Know When Service will be Performed	142	42	87	0.000
	Providing Prompt Service	144	44	81	0.000
	Always Willing to Help Customers	160	44	67	0.000
	Never Busy to Responds to Customers Requests	138	59	73	0.000
Assurance	Instil Confidence in Customers	150	39	82	0.000
	Customers Feel Safe in Their Transactions	132	53	84	0.000
	Consistently Courteous with Customers	143	45	83	0.000
	Knowledge to Answer Customer Questions	137	55	77	0.000
Empathy	Providing Individual Attention	146	49	75	0.000
	Convenient Operating Hours	143	54	74	0.000
	Provide Personal Attentions	145	57	69	0.000
	Having Customer's Best Interests at Hearts	164	43	64	0.000
	Understanding Specific Needs of Customers	157	50	63	0.000

Correlation Analysis

A correlation analysis was performed between the mean for general satisfactions and the perceptions minus expectations gaps for all five-service quality dimensions, i.e. tangibility, reliability, responsiveness, assurance and empathy. Results of the test indicated that there is a positive and linear relationship between the gaps and the overall satisfaction level of tourists visiting Tasik Kenyir shown by the significant value of 0.000. This indicated that as the gaps become more positive (Perception higher than Expectation), the satisfaction level would also increases. However, the Pearson Correlation also indicated that the gaps (perception minus expectations) in Tangibility, Reliability, Responsiveness and Assurance have a low correlation with the overall satisfaction level as shown by the correlation value of 0.327, 0.376, 0.365 and 0.372 respectively. The correlation value of 0.420 for Empathy indicated that the variable have a moderate correlation with the tourists' overall satisfaction level. These results can be observed in table 3.

Table 3: Correlation Analysis between General Satisfaction with the Mean Gap of Perceptions and Expectations

Correlation Analysis		Tangibility Gap Mean P Minus Mean E	Reliability Gap Mean P Minus Mean E	Responsiveness Gap Mean P Minus Mean E	Assurance Gap Mean P Minus Mean E	Empathy Gap Mean P Minus Mean E
General Satisfaction (Mean)	Pearson Correlation	0.327(**)	0.376(**)	0.365(**)	0.372(**)	0.420(**)
	Sig. (2-tailed)	0.000	0.000	0.001	0.000	0.000

** Correlation is significant at the 0.01 level (2-tailed).
P=Perceptions   E=Expectations

Ranking of Important Service Features

Respondents were asked to rank the five important service features by giving points to the five general features of a service. The features are *Physical Facilities, Dependability and Accuracy of Service, Prompt Service, Knowledge and Courtesy,* and *Care and Attention* of staffs working at Tasik Kenyir. These points were then converted into percentage and eventually the mean score were calculated. The higher the mean score, the more important is the features to the tourists. Results are shown in Table 4.

Table 4: Ranking of General Service Features from Tourists Perceptions

Service Features	Mean Score	Ranking
Physical Facilities	21.35	1
Knowledge and Courtesy of Staff	20.42	2
Dependability and Accuracy	20.06	3
Prompt Service	19.55	4
Care and Personal Attention	18.57	5

CONCLUSION AND RECOMMENDATIONS

It is clear from the analysis that there is significant difference between the expectations and the perceptions of tourists towards the actual services delivered by the organisations operating at Tasik Kenyir. The Wilcoxon Signed Ranks test revealed that a substantial number of tourists experienced negative gaps; which indicates that the service providers at Tasik Kenyir has fail to meet or exceeds the tourists expectations for all 22 variables in the components of the service quality dimensions. As such the service providers have much to do in improving their services to at least match the expectations of tourists that are unique, complex and unpredictable. No doubt, it is a daunting task but it has to be done to ensure repeat visits to Tasik Kenyir. The rank of the five service features and the correlation analysis provides a good indication on the service features that need improvement the most. However all service features are important since they are interrelated and contributes significantly to the overall satisfaction level of a memorable holiday experience. In this light, the author would like to offer some recommendations that would assist the service provider in enhancing their services. First and foremost, a

service quality audit should be conducted on an annual basis. The main purpose of conducting this audit is to assess the quality of the tourist experience focusing on issues such as physical facilities, care and attention given by service providers, safety and security, after-hour service, speed of delivery, courtesy and politeness of staff and so on. To ensure the reliability of the audit, such assessments should be carried out without the prior knowledge of the organisations operating at Tasik Kenyir and the results from the audit can be communicated to the authorities responsible for the management and operations of Tasik Kenyir. Another effective approach to enhance the service quality at Tasik Kenyir is to provide comprehensive training to employees especially for those who interact directly with the customers. Training should focuses on areas such as communication skills, ethics, telephone manner, motivation and so on. The training should be conducted on a continuous basis and up dated from time to time. In this training, important feedback from employees can be use to improve future training. Those attending the training should also be evaluated in a consistence manner using measurable specifications.

Tests also indicate that the physical facilities are the number one priority of customers. Hence, physical facilities such as toilet, rest area, eating premises, place of prayer, boathouses and information centre must be improved, enhanced and up-graded. A more important issue is the maintenance of these facilities. Issues such as cleanliness, tidiness, durability, reliable supply of water and electricity should be a priority in the minds of authorities such as the state government of Terengganu. Finally, the *Perceived Quality* such as images, advertising, brand names and inferences about quality are critical (O'Neill and Black, 1996). Reputation and precise communication are very important. Tourists visiting Tasik Kenyir should have accurate information on the type, volume and quality of products and services available. Coupled with flexibility, this will hopefully ensures that the right products and services are delivered at the right time, the right location and with the right price. Thus no false expectations are created in the minds of tourists. While the quest for quality is obviously a continuous and difficult process, it is vital that the survival of the tourism industry in Terengganu is not hindered by failure to deliver the highest quality products and services

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REFERENCES

Asubonteng, P, McCleary, K. J. and Swan, J.E. (1996), SERVQUAL Revisited: A Critical Review Of Service Quality, *The Journal Of Service Marketing*, 10 (6): 62-81.

Augustyn, M. and Ho, S.K. (1998), Service Quality and Tourism. *Journal of Travel Research*, 37(1): 71-76.

Berry, L.L, Zeithaml, V.A. and Parasuraman, A. Quality Counts in Services Too, in O'Neill, M. and Black, M. (1996), Current Quality Issues in the Northern Ireland Tourism Sector, *The TQM Magazine*, 8 (1):15-19.

Buttle, F. (1996), SERVQUAL: Review, Critique, Research Agenda, *European Journal of Marketing*, 30(1): 8-32.

Feigenbaum, A.V. (1983), *Quality Control Handbook*, 3rd Edition. New York: McGraw-Hill.

Foster, D. (1993), *VIP: An Introduction to Hospitality*. Singapore: McGraw-Hill.

Iacobucci, D. Grayson, K. and Ostrom, A. (1994), Customer Satisfaction Fables, *Sloan Management Review*, 35(4): 93-96.

Jones, P. and Lockwood, A. (1989), T*he Management of Hotel Operations*. London: Cassell Educational Ltd.

Ministry of Culture, Arts and Tourism, Malaysia. (2004), *Amazing Malaysia, Career Prospects and Pathway in the Tourism and Hospitability Industry*: Kuala Lumpur, Malaysia.

O'Neill, M. and Black M. (1996), Current Quality Issues in the Northern Ireland Tourism Sector. The TQM Magazine, 8(1):15-19.

Oakland, J.S. (1989), *Total Quality Management*, Oxford: Butterworth-Heinemann Ltd.

Owen, B. and Malkovich, P. (1995), *Understanding the Value of ISO 9000*, Tennessee: SPC Press, Inc.

Parasuraman, A. Zeithaml, V.A. and Berry, L.L. (1985), A Conceptual Model of Service Quality and its Implications for Future Research, *Journal of Marketing*, 49: 41-50.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1988), SERVQUAL: A multiple-item Scale for Measuring Customer Perceptions of Service Quality, *Journal of Retailing*, Spring: 12-40.

Rowley, J. (1998), Quality Measurement in the Public Sector: Some Perspectives from the Service Quality Literature. *Total Quality Management*, 9 (2/3): 321-344.

Sirohi, N. McLaughlin, E.W. and Wittink, D.R. (1998), A Model of Customer Perceptions and Store Loyalty Intentions for a Supermarket Retailer, in Disney, J. (1999), Consumer Satisfaction and Loyalty: the Critical Elements of Service Quality. *Total Quality Management*, 10(4/5):491-498.

Sureshandar, G.S. Rajendran, C. and Kamalanabhan, T.J. (2001) Customer Perceptions of Service Quality: A Critique. *Total Quality Management*, 12 (1): 111-125.

Zeithaml, V.A., Parasuraman, A. and Berry, L.L. (1985), Problems and Strategies in Service Marketing, *Journal of Marketing*, 49:33-46.

Zeithaml, V.A. Parasuraman, A. and Berry, L.L. (1990), Delivering Quality Service: Balancing Customer Perceptions and Expectations, in Disney, John (1999) Consumer Satisfaction and Loyalty: the Critical Elements of Service Quality. *Total Quality Management,* 10(4/5): 491-498.

Berry, L.L. Zeithaml, V.A. Parasuraman, A. "Quality Counts in Services, Too" in Lovelock, H.L. (1992), *Managing Services: Marketing, Operations & Human Resources.* London: Prentice Hall.

A Comparative Analysis of International Tourist Satisfaction across Regions: A Case Study of Perhentian Island

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ABSTRACT

Tourism has been described as the world's largest growing industry in this century. Currently tourism plays an important role in international business and trade, especially in the global market. In Malaysia the tourism sector registered a 13.6 percent annual growth during the Seventh Malaysia Plan period with the value rising to RM18.7 billion in 2000. Rising competition from neighboring countries intensify the need for long term strategy for the industry. Therefore measuring tourists' satisfaction of a particular destination is critical for ensuring that tourism products and services continue to meet visitors' need and their expectations. This study attempts to identify the demographic characteristics of tourists to Perhentian Island, assess their travel patterns and measure their satisfaction levels across regions. The attractiveness of the island lies in its unpolluted environment, beautiful scenery, white sandy beaches and marvelous coral reef. Using a systematic sampling approach, a sample of 350 respondents was interviewed for this study. Descriptive analysis was adopted to establish the tourists' profile, visit characteristics and satisfaction levels. The study identified important attributes and measured the level of their satisfaction across regions. The findings of this study would facilitate in the policy formulation and development of island based tourism, paving the way for a sustained ecotourism industry in Terengganu and elsewhere.

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INTRODUCTION

It has become a cliché to state that tourism is one of the world's largest industries. Many writers make this claim and support the contention by citing World Tourism Organization or World Travel and Tourism Council data on shares of Gross Domestic Product or the number of tourist arrivals. And there is no exception for Malaysia. Over the past several decades, the tourism industry has become one of the fastest growing industries within the service sector in Malaysia. Its importance is set to grow even more as the economy transits into a post-industrial society. The amount of tourism receipts increased from RM9.1 billion in 1995 to RM25.8 billion in 2002 and grew by 15.9% annually in the 1995-2002 period. Meanwhile the average per capita expenditure of tourists increased by 58 percent from RM1,228 (1995) to RM1,939 (2002). As a result, there is a widespread recognition that the tourism industry in Malaysia has contributed significantly to the Malaysian economy since the 1990s. The increased recognition can be gauged by examining some of the key trends and data of the industry. The number of tourist arrivals showed a healthy trend in the period 1995-2002 (with an exception of 1997 and 1998) and grew by 8.6 percent annually during the period (Malaysia Tourism Promotion Board). Based on current trends, Malaysia's target of 15 million tourist arrivals and RM30 billion in foreign exchange earnings from tourism for 2004 are likely to be achieved.

Consequently, its share in the foreign exchange earnings as reflected by the travel receipts in the services account of the balance of payment increased sharply from 20% in 1997 to 48% in 2002. Meanwhile, in a statement by Tourism Malaysia, the tourism industry is said to be the second largest income spinner for the national economy contributing nearly RM43 billion to the nation's GDP in 2002. Not to be ignored is economic linkages between tourism industry and other sectors through backward and forward linkages.

Due to the growing importance of the tourism industry to a country's economy, new destinations were introduced and competition becomes stiffer. The concern for measuring tourist satisfaction has been precipitated by the need to position destinations competitively in the worldwide marketplace. Previous research findings demonstrate that there is a significant relationship among tourist satisfaction, intention to return and positive word-of-mouth communication (Metin, 2000). Customer satisfaction is the leading criterion for determining the quality that is actually delivered to customers through the product or service and by the accompanying servicing.

Simply stated, customer satisfaction is essential for survival of the business entity. Several studies have found that it costs about five times as much in time, money and resources to attract a new customer as it do to retain an existing customer (Abraham Pizam, 1999). This creates the challenge of maintaining a high level of service, awareness of customer expectations and improvement in services and product. It is also highlights the importance of destination management in directing tourism supply and ensuring the needs of tourists.

There are several ways to assess the quality of services and customer satisfaction through subjective, or measures of quality, which focus on perceptions and attitudes of the customer rather than more concrete objective criteria. These measures include customer satisfaction surveys and questionnaires to determine customer attitudes and perceptions of the quality of the service they are receiving.

Tourist destinations attract local and international visitors which come from different cultures. Thus it is not reasonable to examine the satisfaction level of only one specific group of customers. A comparative analysis between groups is required to better understand the importance of an understanding of different languages, food consumption and other national differences (Metin, 2001). For this study, tourists are categorized into four groups, namely European, North America, Asian and other international tourists.

Tourists from Asian countries formed the largest group of visitors to Malaysia last year with 8.9 million arrivals, followed by European and North American namely United States and Canada. Although total arrivals showed a decrease in 2003 compare to 2002, the composition of tourists among regions remains the same amid terrorism and safety issues. Terengganu is one of the favourite states among local and international visitors due to abundance of tourist attractions. In 2002, it recorded 224,834 arrivals and average day of stays of international tourist was 3.4 days. Income generated from the tourism sector was RM543.5 million for the same period and almost double compare to 1998 figures. One of the popular destination among international tourists is Perhentian Island (Fathilah et al, 2003). The attractiveness of the island lies in its unpolluted environment, beautiful scenery, white sandy beaches and marvelous coral reef.

In light of the above, the objectives of this study are:
1) to determine tourist profile to Perhentian Island
2) to determine their visit characteristics
3) to compare satisfaction among international tourists across region

LITERATURE REVIEW

In the global tourism industry, increased competition for tourists has spurned many countries to specialize in developments that will give them an edge over their competitors. Introduction of new places and unique products is part of the strategy implemented. Nonetheless, it is the services provided that is the major element in drawing more visitors as satisfied tourists will recommend it to others as a place to visit. Customer satisfaction has been noted as one of four key elements needed to create and sustain a competitive business (Mayo and Brown, 1999). It is highlighted that determining customer satisfaction is fundamental to effective delivery of services. Ability to judge customer's satisfaction levels and to apply that knowledge potentially gives a hospitality manager an advantage over competitors via such benefits as product differentiation, increased customer retention and positive word-of-mouth communication (Yuksel, 1998).

It is found that some measures of both satisfaction and service quality can be nonequivalent across cultures (Ueltschy et al, 2004). The study adds credence to the belief that ethnicity is a powerful tool in targeting and segmenting markets. Consumers with different characteristics and cultural backgrounds have different thresholds such that if they express the same level of satisfaction, repurchase rate would be systematically different among different customer groups (Mittal and Kamakura, 2001).

There are quite a few numbers of empirical studies to explore the similarities and differences between various groups in relation to vacation travel patterns and attitudes towards specific destinations. It is also similar for literatures on customer satisfaction in tourism and hospitality services, but little has been done with regards to assessment of cultural differences. As international tourists become major visitors for specific destinations, it is reasonable to examine the satisfaction level based on their nationalities. On the demand side, motivations are differ from one person (or group) to another and from one destination to another. In a study, the cross-cultural differences between British and German tourists in Turkey have the potential to reinforce the attractiveness of Turkey for cultural tourism in the German market (Metin, 2002). These findings are important for destination management to learn the profile of its customers and implement effective positioning and market segmentation strategies. A significant body of literature shows that in many tourism destinations, residents have been found to differentiate tourists by nationality. It is also noted that people in the tourism trade have also suggested that

tourists of different nationalities behave in different ways (Pizam and Sussman, 1995). In a study of Italian, French, Japanese and American tourists, a great deal of evidence was generated suggesting that nationality influences tourist behaviour. Japanese tourists were perceived to prefer traveling in groups and avoid socializing with other tourists. Meanwhile, the French bought significantly fewer souvenirs than other nationalities. Therefore studies seeking to account for differences in tourist behaviour are justified. Nonetheless, the study did not explain the reasons for differences found.

In another study, the general hypothesis addressed was that these cross-cultural differences are reflected into the patterns of vacation behaviour. The objective was to determine the similarities and difference in the vacation behaviour of French and English Canadians. Findings support the underlying hypothesis of the research: which stated that culture, as operationalized by language, is a useful predictor of selected dimensions of vacation travel. Significant differences were found between French and English Canadians in few areas and this suggest that tourism, as other forms of leisure and consumer behaviour, is a product of cultural behaviours and process. Marketers must appreciate this cultural influence and adjust and tailor their marketing strategies to the cultural values of the target market (Silvia and Catherine, 1997). To sum up, using both direct and indirect methods of assessment, have generated a great deal of evidence suggesting that nationality influences tourist behaviour. Therefore studies seeking to account for differences in tourist behaviour are justified.

METHODOLOGY

A self-administered, close-ended questionnaire was used to survey a sample of tourists visiting Perhentian Island. The study focuses on 3 major aspects: (1) visitor's profile, (2) visit characteristics and (3) evaluating visitors' satisfaction levels in relation to the attributes. A 5-point Likert scale was used for all the 52 attributes, ranging from "not applicable" to "very satisfied". The 52 attributes were consolidated into 10 categories; attraction, environment, accommodation, transportation, restaurant, activity, facilities, entertainment, residents' attitudes and souvenir. The attributes used were based on review of previous research (Stevens 1992; Bailey 1994; Hailin 1997; Joseph 2000) and were modified to reflect the uniqueness of the island.

Initially a pilot test was conducted on 45 tourists at a number of popular spots on the island. The Cronbach's reliability coefficients were calculated to examine the stability of those attributes measuring tourists' satisfaction during the pilot test. The alpha coefficient for all the 52 attributes was high, ranging from 0.82 to 0.97 and they were well above the minimum value of 0.5, considered acceptable as an indication of reliability. Based on the outcomes of the pilot test, the survey questionnaire was then revised, simplified and modified accordingly.

DATA COLLECTION AND ANALYSIS

A systematic sampling approach was used to collect data. Since tourists arrival to the east coast islands of Peninsular Malaysia are seasonal, the survey was conducted in 3 phases; Phase 1 in April and May (starting of the season), Phase 2 in June and July (peak season) and Phase 3 in August (low season). A total of 350 questionnaires were distributed among the tourists throughout the island during the data collection. The Statistical Package for Social Sciences (SPSS) was used to analyze the data. A descriptive analysis provides the tourist's profile, visit characteristics and satisfaction levels.

FINDINGS

Table 1 below presents the tourists' profile for Perhentian Island. From the total of 350 questionnaires distributed, 301 were collected with the response rate of 86 percent. The demographic profile of the tourists is given in the discussion below.

Demographic Characteristics of Tourists

As depicted in Table 1, 82.7 percent of the tourists were non-Malaysian, particularly from Europe (52.8 percent) whereas only 13.3 percent were Malaysian. As expected, more than two-thirds (83.3 percent) of the visitors have tertiary education. This group of highly educated visitors which is expected to have higher income will enable them to afford the high costs of traveling abroad. About slightly more than half were female, 71 percent were single and majority were young (87.7 percent) which comprises the age group of 35 years old and below.

Table 1: Visitor's Profile to Perhentian Island

Characteristics	Percentage (%) (n=301)
Nationality	
Malaysian	13.3
Non-Malaysian	82.7
Country of Origin	
European	52.8
North American	4.0
Asian	4.0
Others	21.9
Gender	
Male	48.5
Female	51.5
Age	
Below 25 years	41.2
26-35 years	46.5
36-45 years	6.6
46 and above	5.6
Marital Status	
Single	71.1
Married	26.9
Divorced	2.0
Level of Education	
Primary School	4.3
Secondary School	12.3
College	17.9
University	65.4

VISIT CHARACTERISTICS

The travel pattern of tourists sampled at Perhentian Islands is given in Table 2. The travel characteristics are discussed in terms of the number of visits, purpose of visit, length of stay, travel party type, type of tour, source of information about the islands and the type of vacation of the tourists' sampled. With reference to Table 2, almost 80 percent of tourists were on their first trip to Perhentian and less than five percent had visited the island for more than five times. Majority of the respondents (91 percent) cited vacation/leisure as the main purpose of their visit. About three quarters of the respondents stayed at the island for more than four nights and about 60 percent were accompanied by friends or colleagues. Since the majority of tourists to Perhentian were young travelers, they preferred non-packaged tour and were on a multi-destination vacation.

Table 2: Travel Patterns of Tourists

Characteristics	Percentage (%) (n=301)
Number of visit	
First time	77.4
2-5 times	19.3
6 and more	4.5
Purpose of visit	
Vacation/leisure	91.0
Visiting friends and relatives	2.3
Business/meetings	3.7
Others	3.0
Length of stay	
3 nights or fewer	31.6
4-7 nights	38.5
More than 7 nights	38.5
Travel party type	
Alone	16.3
Family	23.9
Friends/colleagues	59.8
Type of tour	

All-inclusive	11.3
Transport plus hotel	9.6
Non-packaged	79.1
Information of the island	
Advertisement	5.0
Resort brochure	8.0
Internet	8.0
Travel agent	15.9
Friends/families/colleagues	51.2
Others	12.0
Type of vacation	
Single destination	3.2
Multi-destination	69.8

VISITORS' PERCEPTION AND SATISFACTION LEVELS

Table 3 gives the average satisfaction scores for all attributes from attraction to souvenir. Overall, majority of the tourists, regardless of their origins, are satisfied with the attractions, environment, resident's attitude, accommodation and restaurants available. Attraction is on top of the list as Perhentian Island has been noted for its natural beauty such as its white sandy beaches and marvelous coral reefs. Unspoiled nature was one of the important criteria among the European tourists. Meanwhile, environment was ranked first by North Americans of all attributes that measure their satisfaction levels.

Almost all visitors were satisfied with services provided in hotels and restaurants. In addition, hotel staffs, salespersons, tourist's guides as well as local folks were considered friendly. It is quite heartening to find that resident's attitude ranked first and second by Asian and European travelers respectively. Nonetheless, tourist operators should never compromise on quality of services provided as it plays major role in tourism industry.

Table 3: Satisfaction Level Across Regions

Attribute	European		North American		Asian		Others	
	Mean[1]	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Attractions	3.25	1	3.17	2	3.44	2	3.31	1
Environment	3.11	4	3.22	1	3.33	3	3.20	2
Resident's Attitude	3.13	2	3.00	5	3.47	1	3.04	6
Accommodation	3.11	3	3.08	4	3.33	4	3.06	5
Restaurant	3.05	5	3.10	3	3.20	6	3.09	4
Transportation	3.02	6	2.98	6	3.23	5	3.10	3
Souvenir	2.57	8	2.92	7	3.04	7	2.66	7
Facilities	2.64	7	2.33	10	2.88	9	2.66	8
Activity	2.57	9	2.42	9	3.03	8	2.52	9
Entertainment	2.41	10	2.57	8	2.72	10	2.11	10

[1] Based on the following scale: 0 = not applicable, 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied and 4 = very satisfied.

Visitors to Perhentian Island also enjoyed a variety of choices and convenience of accommodations and restaurants. In terms of ranking, there seems to be not many differences among the regions. Hotels and restaurants on this island were deemed sufficient, comfortable and relatively cheap. The services provided in hotels and restaurants were judged good and the environment was described as quite clean, tidy and safe. Except for North American tourists, transportation available deemed to be sufficient and cheap.

Souvenirs, other facilities, activities and entertainment were given lower rating by tourists to Perhentian Island. Most of the tourists were dissatisfied with the existing souvenirs and they valued quality and unique gift. As souvenirs can generate extra income to the local community and resort owners, they should produce creative gifts especially crafted to reflect local culture. Nonetheless, the existing souvenirs deemed to be reasonably priced.

Although activity (mainly water-based activities) is ranked second lowest among the attributes, it is mainly due to the dissatisfaction of squid fishing, shark and turtle viewing. Most of the tourists who were not satisfied stated

that they don't find any turtle or shark when they were at the viewing spot. On the other hand, squid fishing is seasonal. However, the most popular water-based activities namely snorkeling, scuba diving and canoeing showed a high rating satisfaction level. The study also indicates that tourists were dissatisfied with the entertainment offered and therefore this attribute showed the lowest mean score.

Among the regions, Asian recorded the highest level of satisfaction from their vacation to Perhentian Island. They were only dissatisfied with two attributes namely facilities and entertainment. Meanwhile, North American visitors were not very pleased with five attributes which is below their satisfaction levels. For Europeans, who formed the bulk of international visitors to Perhentian, four attributes that is below their satisfaction level needs to be addressed. Overall, tourists were quite satisfied with their experience at Perhentian Island as more than 70% of the respondents would like to repeat visitation in the near future.

CONCLUSION

The development of island based tourism in the east coast of Peninsular Malaysia certainly helps the economic growth of the destinations and its surroundings. One of the popular destinations is Perhentian Island and the majority of the visitors are international travelers. Normally the international traveler is the bigger spender (in term of ringgit) compared to domestic tourists and definitely will increase our foreign exchange earnings. The profile as obtained in this study such as demographic and visit characteristics and satisfaction levels will contribute towards better understanding of the market and prepare it for future challenges. The main attraction to Perhentian Island and garnering high level of satisfaction level among international tourist (irrespective of their origins) is the island's natural beauty. White sandy beaches, crystal clear waters and colorful coral reefs are the main attributes but they are fragile commodities and easily damaged without proper preservation. As such, all parties in this industry should play their role and be committed to preserve the island. Relevant authority should concentrate their efforts in developing the area with preserving the nature as their main policy.

Among the regions, North American visitors recorded a different pattern on satisfaction level. It ranked fifth for resident's attitude as compare to first and second for Asian and European regions respectively. Possible explanation is maybe due to culture differences and/or high level of expectation. The study also revealed that all tourists have similar perception on four attributes namely souvenirs, facilities, activities and entertainment. These scored the lowest among all attributes and parties involved should acknowledged their weaknesses and make necessary improvement. These findings are important for destination management to learn the profile of its customers and implement effective positioning and market segmentation strategies. As there are very few studies on satisfaction across regions or nationalities, the findings of this study could be helpful for other researchers undertaking similar research in the future.

REFERENCE:

Bailey, M. (1994). Outbound Markets: China Outbound. EIU Travel and Tourism Analyst. Vol. 6, pp. 9.
Fathilah, I., Kamil, N. K., Marhana, M. A., Fauziah, A. H., Roseliza, M. A. and Saharuddin, A. H. Sustainability of Ecotourism in Malaysia: The Characteristics and Satisfaction of Island Visitors. Proceedings of the Third UKM-UC International Conference, University of Canberra, Australia on 14-15 April 2003.
Hailan, Q. and Isabella, L. (1997). The characteristics and Satisfaction of Mainland Chinese Visitors to Hong Kong. Journal of Travel Research, Vol. 35, pp. 37-41.
Mayo, M. C. and Brown, G. S. (1999). Building A Competitive Business Model. Ivey Business Journal. Vol. 63(3), Issue 3, pp. 18-23.
Metin, K. And Mike, R. (2000). Tourist Satisfaction with Mallorca, Spain, as an Off-Season Holiday Destination. Journal of Travel Research. Vol. 38, pp260-269.
Metin, K. (2002). Comparative Analysis of Tourist Motivations by Nationality and Destinations. Tourism Management, Vol. 23, pp. 221 – 232.
Metin, K. (2001). Comparative Assessment of Tourist Satisfaction with Destinations Across Two Nationalities. Tourism Management. Vol. 22, pp. 391 – 401.
Mittal, V. and Kamakura, W. (2001). Satisfaction, Repurchase Intent, and Repurchase Behavior: Investigating the Moderating Effect of Customer Characteristics. Journal of Marketing Research. Vol. 38, pp. 131–142.
Pizam, A. and Sussman, S. (1995). Does Nationality Affect Tourist Behaviour? Annals of Tourism Research. Vol. 22(4), pp. 901-917.
Pizam, A. (1999). Customer Satisfaction and Its Measurement in Hospitality Enterprises. International Journal of Contemporary Hospitality Management. pp. 326-339

Silvia, S. and Catherine, R. (1997). A Cross-Cultural Analysis of English and French Canadians' Vacation Travel Patterns. International Journal of Hospitality Management, Vol 16(2), pp. 191-208.

Stevens, B. E. (1992). Price Value Perceptions of Travelers. Journal of Travel Research. Vol. 31, pp. 44-48.

Ueltschy, C. L., Laroche, R., and Yannopoulos, P. (2004) Cross-Cultural Invariance of Measures of Satisfaction and Service Quality. Journal of Business Research Vol. 57, pp 901-912.

Yuksel, A. and Rimmington, M. (1998). Customer-satisfaction: Performance Count.

The Cornell Hotel and Restaurant Administration Quarterly. Vol. 39, No. 6, pp 60-70.

Customer Service Quality In Insurance Industry: The Case Of Islamic Insurance

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ABSTRACT

Customer service quality is becoming increasingly important in the service industries. Globalisation and technological advancement has created a highly competitive market. This affects all organizations regardless of business emphasis. Consequently, this increases the importance of the quality of customer service in the service industry thereby, requiring customer service quality issue be properly addressed. Many leading service providers see quality as a strategic tool in competing with each other. Assessing the customer service quality in the insurance industry is, therefore vital in determining the standard as expected by the industry. Islamic insurance (takaful) is of no exception. This paper examines the level of service quality and customer satisfaction in Islamic insurance in Malaysia. The study employs the SERVQUAL model based on the work of Parasuraman *et. al.* (1988) and the modified version of SERVQUAL, as proposed by Othman and Owen (2000).

INTRODUCTION

Insurance is regarded as a necessity in this present economic environment not only for individuals protecting their dependents but also to organisations or institutions protecting their assets and liabilities. Since the present conventional insurance does not conform to the requirements of syariah, Muslim scholars have to look for an alternative. With that, the most appropriate concept of takaful, which is simply joint-guarantee was introduced. The word takaful stems from the Arabic verb *kafal* which means taking care of one's needs. Essentially, takaful is based on the concepts of *tabarru'* (donation contract) and *mudharabah* (profit-sharing). The concept of *tabarru'* is intended to divide losses and spread liability according to the community pooling system, thus avoiding the element of uncertainty. On the other hand, the concept of mudharabah, the takaful operator acting as the entrepreneur, will accept payment of the contributions from investors or providers of capital. Under this contract, the profit from the operations will be shared among the takaful operators and participant according to a profit-sharing ratio as agreed by both parties.

In Malaysia, the acceptance of Islamic insurance is still very low, for example, according to the Central Bank of Malaysia the penetration rate (the ratio of the number of certificate to the total population) of takaful is only 3.8%. Why the acceptance of Islamic insurance scheme among Malaysian community is still low? Is it because of little awareness among Muslim in Malaysia or is it because of the quality of service, which is not up to the expectations level of the consumers.

This motivates the researchers to conduct a study on the service quality of Islamic insurance companies to understand the levels of expectations and perceptions of customers. Furthermore, customers have become more sophisticated and therefore the importance of service quality becomes more pressing. With the domination of conventional insurance companies in Malaysia since the 1970s, competition for clients is intense. Hence, Islamic insurance industry in Malaysia has to think strategically by providing high quality products and services to satisfy their customers. In order for these companies to provide high quality products and services, they first need to investigate the level of customers' perceptions and expectations to their service quality. Through that information, they could then strategically adjust their service quality toward customers' satisfactions.

LITERATURE REVIEW

Majority of the service quality literature focuses in industries such as hospitals, library, telecommunications and there is still lack of empirical research in the Islamic financial sector though recently few studies start to focus their

attention in the Islamic banking (for example, Shahril *et. al*., 2004; Izah and Wan Zulqurnain, 2004; Othman and Owen, 2000). However, as far as we are aware, there is no research that has been undertaken to measure the level of service quality in Islamic insurance industry.

What is service quality? Literature in service quality defines service quality in terms of subjectivity, attitude, and perception. Zeithaml (1987) explains that service quality is the customers' judgement about an entity's overall excellence or superiority. It is a form of attitude, and results from a comparison of expectations to perceptions of performance received. Lewis and Booms (1983) define service quality as a measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent basis.

The definition makes it clear that service quality revolves around customers' expectations and their perceptions of service performed. In the service marketing literature, perceptions (P) are defined as consumer beliefs concerning the service received. The literature also defines expectation (E) as desires or wants of consumers; what they a service provider should offer rather than would offer. The P-E service quality model is a measurement specification in which perceived quality is equivalent to perceptions - minus - expectations (Teas 1993).

Parasuraman *et. al.* (1991) explain that consistent conformance to expectations begins with identifying and understanding customer expectations. Developing a system to identify customer expectations is critical. Only then will effective service quality strategies be developed.

A conceptual model of service quality designed by Parasuraman *et. al.* (1985) was used and still serves as the foundation for understanding customer expectations and service performance. The researchers discovered that there are a number of "gaps" or failure points between customer expectations and service performance.

There are five gaps altogether in the model and the definitions of each of the gaps are as follows:

Gap 1: Difference between consumer expectations and management perceptions of consumer expectations.
Gap 2: Difference between management perceptions of consumer expectations and service quality specifications.
Gap 3: Difference between service quality specifications and the service actually delivered.
Gap 4: Difference between service delivery and what is communicated about the service to consumers.
Gap 5: Difference between consumer expectations and perceptions.

Gap 5, also called the service gap is a function of the other four gaps. It is the most critical because it is the customers' overall assessment of what was expected compared to what is received. The ultimate aim in improving service quality is to narrow this gap as much as possible. To do so, service providers need to reduce or close the other four gaps (Lovelock 1998).

In the Service Quality (SQ) literature, SQ dimensions or attributes are those attributes that contribute to consumer expectation and perception of service quality. These are the attribute of service that are important to the customer and contribute significantly to their quality assessment. Knowledge of these dimensions will lead to improve service quality in the future.

Many researchers and quality scholars have recognized the need to develop valid and distinct measures of service quality given the rise of service development in the last few decades. In management literature, different models have been developed in order to find out the determinants of the concept of service quality as well as the appropriate quality measurement techniques (for example, Frost and Kumar 2000, Bienstock *et. al.* 1996, Garvin 1988, Parasuraman *et. al.* 1988). All of them refer to the concept of service quality as a multidimensional phenomenon, which requires multi-item measures. However, there are still debates going on in relation to the choice of the right and credible measurement tool.

Gronroos (1988) developed a five key dimension of SQ; professionalism and skills; reputation and credibility; behaviour and attitudes; accessibility and flexibility; reliability and trustworthiness.

Le Blanc and Nguyen (1988) identified three dimensions of quality; physical quality (equipment, premises, tangibles); corporate quality (image and profile organization); and interactive quality (customer contact with service personnel and other customers).

However, among the most popular assessment tools of SQ is SERVQUAL, an instrument designed by the marketing research team of Parasuraman, Berry and Zeithaml (1985, 1988, 1990, 1991, 1993 and 1994). They began their work with qualitative research, which suggested ten dimensions of SQ (reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing the customer and tangibles) and through numerous qualitative research, they evolved a set of five dimensions, which have been consistently ranked by customers to be the most important for SQ, regardless of service industry. These dimension are; Tangibility (the appearance of physical facilities, equipments, personnel, and communication materials), Reliability (the ability to perform the promised service dependably and accurately), Responsive (the willingness to help customers and to provide prompt service), Assurance (the knowledge and courtesy of employees and their ability to convey trust and confidence) and Empathy (the provision of caring, individualized attention to customers). The researchers developed a 22-item instrument with which to measured customers' expectations and perceptions (E and P) of the five dimensions. The measurement is managed by using two different forms: one to measure expectation and the other to measure perception.

The basic assumption underlying the SERVQUAL scale is that performance below expectation (obtaining a negative score) leads to a perception of low SQ, while exceeding expectation (obtaining a positive score) leads to a perception of high SQ.

Othman and Owen (2000) proposed that a new dimension called "Compliance with Islamic law" to be added to Parasuraman's five dimensions in studying service quality in Islamic banks. This dimension includes such items as run on Islamic laws and principles, no interest paid nor taken on savings and loans, provision of Islamic products and services, provision of interest free loans and provision of profit-sharing investment products. This model referred to as CARTER model appears valid to be adopted in Islamic banks as found by both Shahril *et. al.* (2004); and Izah and Wan Zulqurnain (2004).

METHODOLOGY

This study can be categorised as a descriptive and inferential in nature whereby it describes the level of service quality of Islamic insurance in Malaysia. This was done using SERVQUAL instrument in which customers' expectations and perceptions of Islamic insurance's service performance were compared. This study also tried to infer the customers' level of satisfactions toward Islamic insurance. Cross sectional method was chosen for this study. This requires the data to be collected at the same time. Questionnaires were distributed to the respondents concurrently and must be returned within a certain time frame. This is to ensure the accuracy and precision for the responses. Respondents were selected among those who were customers of Islamic insurance in Malaysia namely Takaful Nasional and Syarikat Takaful Malaysia Berhad. The sample size was 600 respondents, covering areas of Terengganu, Kelantan and Pahang. 200 respondents were selected from each state.

The questionnaire used in this study consisted of structured and close-ended questions. The questionnaire was divided into three sections. Sections One dealt with the relative importance of SQ dimensions This was derived from the refined SERVQUAL scale used by Parasuraman *et. al.* (1991). Section Two consisted of 26 questions/statements related to service quality dimensions. The questions had been organized under the proposed framework based on the CARTER model. Section Three consisted questions pertaining to customer overall satisfactions of the service quality.

In computing the mean SERVQUAL scores, 26 statements of the SERVQUAL in Section 2 of the questionnaires which represent the expectations and perceptions statements were grouped and linked according to the six dimensions as shown below:

DIMENSIONS	STATEMENTS
1. Compliance	Statements 1-4
2. Tangibility	Statements 5-8
3. Reliability	Statements 9-13
4. Responsive	Statements 14-17
5. Assurance	Statements 18-21
6. Empathy	Statements 22-26

Assessing the quality of service using SERVQUAL involves the calculation of the difference between the ratings respondents assigned to the paired perception - expectation statements.

Analyses were done on the overall service quality, importance rating on SQ dimension, SERVQUAL scores of each SQ dimensions, SERVQUAL scores of each of the 26 statements, and customer satisfactions toward Islamic insurance companies.

FINDINGS AND DISCUSSION

Analysis of Overall SERVQUAL Score

The overall SERVQUAL score is the result of the average perception score minus the average expectation score that were derived from the 26 paired statements of the SERVQUAL instruments. The unweighted SERVQUAL score is the average perception minus the average expectation score of the six SQ dimensions while the weighted SERVQUAL score is the average score that took into consideration the weight that were assigned by the respondents to each of the dimensions. The mean weights that represent the extent of importance given by the respondents are depicted in Table 1.
The respondents rated compliance with Islamic laws as the most important dimension followed by reliability, responsiveness, assurance, empathy and tangibility as the least important.

Table 1: Mean Importance of SQ Dimensions

Dimension	Mean Importance (Weight)	Rank
Compliance	1.8867	1
Tangibility	4.5700	6
Reliability	3.1617	2
Responsiveness	3.4500	3
Assurance	3.7250	4
Empathy	4.1950	5

The overall SERVQUAL score is presented in Table 2 below. The negative mean for the SERVQUAL score indicates that the respondents' expectations exceed their perceptions of service quality provided by the Islamic insurance companies.

Table 2: Overall SERVQUAL Score

Description	Mean
Average Perception	3.9947
Average Expectation	4.4832
SERVQUAL SCORE	-0.4886

Analysis of SERVQUAL Score of the Six Dimensions

The service quality scores were also determined for each of the six service quality dimensions. This is shown in Table 3 below.

Table 3: SERVQUAL Score of the Six Dimensions

Dimension	Perception (P)	Expectation (E)	Gap Score (P-E)
Compliance	4.3708	4.6708	-0.3000
Tangibility	3.9358	4.3062	-0.3704
Reliability	3.8057	4.5500	-0.7443
Responsiveness	3.9242	4.4646	-0.5404
Assurance	4.0504	4.5100	-0.4596
Empathy	3.8810	4.3977	-0.5167

Based on the results above, the reliability dimension shows the biggest gap with -0.7443. This is followed by responsiveness dimension with a score of -0.5404 and empathy dimension with the score of -0.5167. The assurance dimension had the score of -0.4596 and the tangibility dimension had the score of -0.3704. The compliance dimension had the smallest gap with the score of -0.3000.

It can be seen that all the six dimensions had negative gap scores indicating that Islamic insurance companies fail to meet the expectations of their customers. These six dimensions need careful and considerable attention by the Insurance companies because the gap could widen and customer dissatisfaction could arise. In order to close the gap and increase service quality, the Islamic Insurance companies need to identify and improve the specific areas where the gap occurs. Analysing each of the 26 items under their respective dimensions could give more specific insights on the areas that need improvement.

Analysis of SERVQUAL Score of the 26 Paired-Statements

This analysis was done in order to measure the gap between the customers' expectations and their perceptions of the Islamic Insurance companies based on the 26 items or statements pertaining to service quality. The mean for the perception, expectation, and SERVQUAL score (Gap score) were derived for each statement and the results are presented in Table 4.

The SERVQUAL scores with the minus sign mean that the customers felt that the service quality was below their expectation and those with plus sign mean that the service quality provided was above their expectation.

Based on the results depicted in Table 4 below, all statements show negative scores indicating that customers rated service quality of Islamic insurance companies as below their expectations. This means that, Islamic insurance companies need to examine their services and make some improvements so that customers' perceptions of their services will be better. The companies could start by focussing on those areas in each dimension, having the biggest gap. For example, in the reliability dimension, the biggest gap is pertaining to performing service right the first time (-0.9233). This means that the companies did not give them the right service and not very reliable in performing their service.

Table 4: SERVQUAL Scores by Statements

Aspect Of Service Quality	Perception (P)	Expectation (E)	Gap Score (P-E)
Compliance			
1. Adherence to Islamic law (syariah)	4.4000	4.7167	-0.3117
2. Provision of interest free products	4.3550	4.6667	-0.3167
3. Provision of products that are accepted by Islamic law	4.3850	4.6883	-0.3033
4. Provision of profit sharing investments	4.3433	4.6117	-0.2383
Tangibility			
5. Modern-looking equipments	4.0183	4.4350	-0.4167
6. Appealing physical facilities	3.9067	4.2233	-0.3167
7. Employees are neat un appearance	3.9767	4.2367	-0.2600
8. Materials associated with the service are visually appealing	3.8417	4.3300	-0.4883
Reliability			
9. Keeping their promise	3.9017	4.5383	-0.6367
10. Sincere interest in solving customers' problems	3.9983	4.5817	-0.5883
11. Perform service right the first time	3.6133	4.5367	-0.9233
12. Provide services at the time they promise to do so	3.7767	4.6083	-0.8317
13. Insist on error-free records	3.7383	4.4850	-0.7467
Responsiveness			
14. Employees tell customers exactly when services will be performed	3.8533	4.5150	-0.6600
15. Employees give prompt service to customers	3.8917	4.5100	-0.6183
16. Employees are willing to help customers	4.0333	4.5883	-0.5550
17. Employees are never too busy to respond to customers' requests	3.9183	4.2450	-0.3267
Assurance			
18. Behaviours of employees instil confidence in customers	3.9567	4.4350	-0.4783
19. Customers feel safe in their transactions	4.0783	4.4767	-0.3983
20. Employees are consistently courteous with customers	4.0750	4.5650	-0.4900
21. Employees have the knowledge to answer customers' questions	4.0917	4.5633	-0.4717
Empathy			
22. Giving customers individual attention	3.8383	4.3817	-0.5433
23. Convenient operating hours	3.9617	4.4433	-0.4817
24. Having employees who give customers best interest at heart	3.7600	4.1600	-0.4000
25. Having employees who give customers personal attention	3.8783	4.4567	-0.5783
26. Employees understand the specific needs of customers	3.9667	4.5467	-0.5800

For responsiveness dimension, the biggest gap is –0.6600, which is the score for statement pertaining to employees telling customers exactly when services will be performed. The respondents felt that Islamic insurance companies are not responsive in terms of telling them when services will be performed.

The statements in the assurance dimension have the gap around –0.4. The respondents felt that the employees of the companies concerned were not properly equipped with the knowledge to answer customers' questions. The gap score of –0.4717 reflects this.

The SERVQUAL score for empathy dimension ranges from –0.5800 to –0.4000. The biggest gap is for the statement relating to employee understands the specific needs of customers. This reflects that employees of the Islamic insurance companies failed to identify and understand the customers' specific needs. The results also indicate that the companies lack employee giving personal attention to their customers.

Both the compliance and tangibility dimensions show a very small gap scores. For example, in the compliance dimension, the gap score ranges from –0.2383 to –0.3167 whereas in the tangibility dimension, the score ranges from –0.2600 to –0.4883. Again, in these two dimensions, there are still areas that need to be addressed.

Analysis of Customer Satisfaction

Customer satisfaction is the ultimate outcome sought by service quality programs. The purpose of analysis of customer satisfaction in this research is to confirm the satisfaction or dissatisfaction as a result of high or low service quality level. The respondents were asked to rate statements based on their level of satisfaction: from 1 to 5 where 1 = extremely dissatisfied, 2 = dissatisfied, 3 = neutral, 4 = satisfied, and 5 = extremely dissatisfied.

Our result shows that the mean for overall satisfaction toward Islamic insurance companies is 3.9400. This indicates that overall customers of Islamic Insurance companies are satisfied with the service quality given by the companies.

Customers' Satisfaction Frequency Analysis

We further analyse the respondents in terms of their satisfaction toward Islamic insurance companies. The frequency analysis and the percentage indicators of the respondents are shown in Table 5. From the result, it shows that only 20.8% of the respondents were neutral or dissatisfied toward the overall satisfaction of the banks services. 475 respondents or 79.1% were satisfied with the service quality of the companies.

These findings indicate that even though customers perceived Islamic insurance companies were performing below their expectations (negative weighted SERVQUAL score) yet they are satisfied with the service. This does not mean that Islamic insurance companies should be happy with the findings because they still need to find ways to increase their service quality so as to narrow the gap as much as possible. Consequently the gap widen if nothing is done to improve the quality of their services.

Table 5: Frequency Tabulation of Customer Satisfaction

	Frequency	Percent
Overall Satisfaction:		
Very Dissatisfied	5	0.8
Dissatisfied	14	2.3
Neutral	106	17.7
Satisfied	362	60.3
Very Satisfied	113	18.8

CONCLUSION

This study was undertaken with the objective of determining the level of service quality of the Islamic insurance companies in Malaysia from the perspectives of the customers. Customers' perceptions are very important especially in the service industry such as the Islamic insurance industry since there is high customer involvement in the delivery of service itself.

The research findings indicate that customers' expectations of service quality are higher than their perceptions. The negative SERVQUAL score of -0.4886 depicts this. This means that service quality level is unacceptable or less than satisfactory. The Islamic insurance companies need to upgrade their service quality level in order to face the global challenges and remain competitive. As pointed out by Berry (1995), good service is not good enough to

insure differentiation from competitors, to build customer relationship, to compete on value without competing on price, to inspire employees to become even better at their work and at their lives, to deliver an unmistakable financial dividend. So, to be successful, Malaysian Islamic insurance companies need to listen to their customers and make good services as their culture.

As an overall, customers of Islamic insurance companies rated compliance of Islamic law as the most important dimension when assessing service quality in Islamic insurance companies followed by reliability, responsiveness, assurance, empathy and tangibility. It was also found that the biggest service quality gap occurred in the reliability dimension. This is followed by responsiveness, empathy, assurance, and tangibility. The smallest gap occurred in the compliance dimension. Further detailed analyses of the service quality dimensions were done and the result could help Islamic insurance operators in Malaysia to focus on the crucial areas, which could be improved in order to, eliminate or decrease the negative service quality gap.

This research also looked into the level of customer satisfaction toward Islamic insurance companies. Interestingly, we found that as an overall, the customers of Islamic insurance companies were satisfied with the service of these companies. Further analysis on customers' satisfaction revealed that the number of satisfied customers were high 79.1%). This conflicting scenario is quite surprising. We believe that Muslim community would prefer to have a service, which complies to the Syariah concept even though the quality of service is below their expectation. However, Islamic insurance companies should not be happy with the findings. They need to find ways to increase their service quality so they could compete with other conventional insurance companies providing similar services and products.

This study has its limitations. Future research should focus on a larger sample and cover a bigger geographical area in order to have a more representative sample and more conclusive findings. In addition, the buying patterns among Muslim community are another area to be explored.

REFERENCES

Anbalagan (1995). *Consumers Perception on Quality of Service in Malaysian Telecommunication Industry*, Unpublished Master's Thesis, UPM, Serdang, Malaysia.

Anderson E. W. & Fornell C. (1994). *A Customer Satisfaction Research Prospectus*. In R. T. Rust & R. L. Oliver (Eds.) Service Quality: New Direction in Theory and Practice, pp. 241-268.

Bienstock, C. C. Mentzer J. T. and Bird M. M. (1997). *Measuring Physical Distribution Service Quality*. Journal of the Academy of Marketing Science. 25(1), pp. 31-44

Cronin J. and Taylor S. (1992), *Measuring SQ: A Re-examination and Extension*. Journal of Marketing. 56(2), pp 55-68.

Cronin J. and Taylor S. (1994), *SERVPERF versus SERVQUAL: Reconciling Performance-based and Perception-minus-expectations Measurement of Service Quality*, Journal of Marketing, 58(1), pp 125-131.

Frost F. A. and Kumar M. (2000). *INTERSERVQUAL – An Internal Adaptation of the Gap Model in Large Service Organizations*. Journal of Services Marketing. 14(5), pp. 358-357.

Gronroos C. (1988): *The Six Criteria of Good Perceived SQ*. Review of Business. 9(3), pp. 10-13.

Le Blanc G. and Nguyen N. (1988). *Customers' Perceptions of Service Quality in Financial Institutions*. International; Journal of Bank marketing. 6(4) pp. 7-18.

Irwan. M. E. (2000). *Determinants of Customer Satisfaction in Customer Service within Supermarkets*. Unpublished master's thesis, UPM, Serdang, Malaysia.

Izah. M. T. and Wan Zulqurnain W. I (2004), Quality service in Islamic Banking: The Malaysian Case, Proceedings of the National Seminar in Islamic Banking and Finance, Putrajaya, Kuala Lumpur, 2-3 March, pp. 79-90.

Lewis R. C. and Booms B. H. (1983). *The Marketing Aspect of Service Quality*, In Berry L. Shostack G. and Upah G(eds), Emerging Perspectives on Services Marketing (pp.99-107). American Marketing, Chicago, IL.

Lovelock L. W. (1998). *Principles of Service Marketing and Management*. Prentice Hall.

Othman A. Q. and Owen L. (2001). *Adopting and Measuring Customer Service Quality in Islamic Banks: A Case Study in Kuwait Finance House*. International Journal of Islamic Financial Services. Journal of Marketing. 1(3). pp. 6-12.

Parasuraman. A., Berry L. and Zeithmal V. (1985). *A Conceptual Model of SQ and Its Implications for Future Research*. Journal of Marketing. 49(3). pp. 41-50.

Parasuraman. A., Berry L. and Zeithmal V. (1988), *SERVQUAL: A Multi-item Scale for Measuring Consumer Perceptions of SQ*. Journal of Retailing. 64(2). pp. 12-40.

Parasuraman. A., Berry L. and Zeithmal V. (1990), *Five Imperatives for Improving SQ.* Sloan Management Review. 29(2). pp. 29-38

Parasuraman. A., Berry L. and Zeithmal V. (1991), *Perceived Service Quality as a Customer-based Performance Measure: An Empirical Examination of Organizational Barriers Using an Extended Service Quality Model.* Human Resource Management. 30(3). pp. 335-364.

Parasuraman. A., Berry L. and Zeithmal V. (1993), *Research Note: More on Improving SQ Measurement.* Journal of Retailing. 69(1). pp. 140-147.

Parasuraman. A., Berry L. and Zeithmal V. (1994), *Reassessment of Expectations as a Comparison Standard in Measuring SQ: Implications for Further Research.* Journal of Marketing. 58(1). pp. 111-124.

Sudin Haron, Wan Nursofiza and Sharil Shafie, (2004), Adopting and Measuring Customer Service Quality (SQ) in Islamic Banks: A Case Study in Bank Islam Malaysia Berhad, Proceedings of National Seminar in Islamic Banking and Finance, Putrajaya, Kuala Lumpur, 2-3 March, pp. 91-102.

Teas R. K. (1993). *Expectations, Performance Evaluation, and Consumers Perceptions of Quality.* Journal of Marketing. 57(4).

Zeithmal. V. (1987). *Defining and Retailing Price, Perceived Quality, and Perceived Value.* Report No. 87-101. Marketing Science Institute. Cambridge. MA.

Zeithmal. V. and Bitner M. (1996). *Services Management.* McGraw-Hill, New York.

Exploratory Study on Demand Determinants of Life Insurance: A Case Study in Kuching

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ABSTRACT
Life insurance industry in Malaysia has proven a significant growth to Malaysian Gross National Product (GNP). The potential growth for the life insurance industry is unquestionable. Therefore, this study is to determine the factors that influencing the demand of life insurance whereby the study will focus on a case study in Kuching, Sarawak. The study is based on 322 out of 350 questionnaires that distributed in Kuching city. The background of respondents is studied and respondents also needed to answers statements regarding respondents' perception towards premium payment of life insurance, other saving and level of income that may influence purchasing of life insurance.

INTRODUCTION

Insurance is financially defined as financial arrangement that redistributing unexpected loss and from law point of view is defined as contractual calculation that one promise to arrange compensation to another on his/her loss [Dorfman (1982)]. Life insurance purchased in mind to protect the policyholder and family from death or disability. Death and disability are main reason for loss of income to support the family.

There are two kinds of life insurance offered in Malaysia that is term insurance and permanent (whole life) insurance. Term insurance is cheaper and suitable if someone needed life insurance for a specific period of time such as paying off mortgage. On the other hand, permanent insurance will cost more than term insurance and the advantage is the policy works as saving plan for the future as well as protecting the family of policyholder[1].
Life insurance Industry in Malaysia has proven a significant growth over the decades. The life insurance premium income was only 1.5% of Malaysian Gross National Product (GNP) in 1990 and it was increased to 3.7% in year 2001. The number of new life insurance policies issued in a year was also showed a significant growth. In 1990, there were only 498,338 new policies issued but in year 2001 there were 1,381,125 new policies issued. It was approximately 300% increased over past ten years. The number of registered agents for life insurance was 37373 agents in 1990 but in year 2001 there were 88,504 agents that is increased almost 250%[2].

Life insurance growth is also quite high in Sarawak especially in its big city of Kuching. Urbanisation of Kuching itself contributes to life insurance industry a sharp increase. Kuching City's population is experiencing quite rapid growth. In year 2000 survey that is published by Statistic Department of Malaysia, the District of Kuching Utara has the third highest populated among city halls in Malaysia. In 1991 there were 277,346 people[3] and in year 2000, it increased to 315,609 people[4]. The population growth shows that the potential of life insurance industry in Sarawak is growing as well.

OBJECTIVES

This paper is an empirical studies on factors that influencing demand of life insurance. The demand of life insurance is significant to proper the growth of life insurance industry in Malaysia as the industry is increasingly significant to Malaysia's GNP. Understanding the demand would contribute to develop strategy in promoting or controlling the demand of life insurance in Malaysia.

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[1] http://www.thebeehive.org/insurance/Basics-insurance-for-you-life.asp (5/11/2003)
[2] Source of data is LIAM website at http://www.liam.org.my (Date of access 20/10/2003)
[3] Data exracted from http://www.citypopulation.de/Malaysia.html (Date of access 1/11/2003)
[4] Data exracted from http://www.statistics.gov.my/English/laamukim.htm (Date of access 1/11/2003)

PROBLEM STATEMENT

Negative perception and naiveté of Malaysian are the recognized barriers that threat the growth of life insurance industry in Malaysia. Educating Malaysian about life insurance is a way to promote the growth of this industry. However, knowledge of the background of customers such as culture, education background, religion and age, is essential to enable the approach to be affective. Factors that in favour and oppose of life insurance is vital in supporting this industry to be improved in the future.

LITERATURE REVIEW

There are various past research indicate factors influencing the demand of life insurance. Many argued that factors of demand life insurance are varied from one country to another [Hwang T (2003)]. This research is studied the three main factors that will influence customers to purchase life insurance that is individual income, other savings and premium payment.

Individual Income

A life cycle theories[5] say that planned consumption such as purchasing food, furniture, or even house is based on individual's permanent income. If there is an unexpected rise in their income, they would likely to save most, if not all of it [Sloman (1994)]. Purchasing insurance will mean the household expenditure will be increased. Therefore, individual will not purchase insurance expenses if individual expect their future income is low [Venezia(1988)]. Therefore it is concluded that an individual would rather save if there were a balance from their income after deducts the amount of planned consumption.
The level of income is an important role to life insurance consumption [Hwang T(2003)]

Other Savings

Saving for the future is a way of modern life since world economy will experience unexpected recession or unemployment. For example, Asian crisis in 1997 was unexpected and many industry experiencing great loss. Due to the event, many companies were forced to reduce their operating costs and many workers were unemployed. Being unemployed will mean no income for the family. The longer income earner unemployed, the longer the family will suffer. Thus, life insurance is a very efficient form of saving for contingencies such as sudden economy crisis [Borch (1980)]. Purchasing permanent insurance in a way would protect individual and families from such great risk in the future [Palumbo(2000), Kantor & Fishback (1996)].

Saving is also needed if an individual foresee that to have a comfortable retirement is to have lot of money to spend. By purchasing permanent life insurance, it will guarantee to have a saving in old age [Brown (1999)]. It is proven that the husband who considered old age saving is important usually preferred to purchase whole life insurance and purchase shares [Euwals, Eymann & Borsch-Supan (2002)]

Capital Asset Pricing Model (CAPM) illustrates that high-risk investments are expected to offer high returns because of their risk and conversely lower returns will be offered by low-risk investment[6]. The return of life insurance is expectedly low as the risk of purchasing life insurance is considerably low. It is also generally accepted that life insurance is one the most respectable investment after saving account and government bonds [The Economist (2003)]. The return of purchasing government bond and saving account is worthwhile in regards the risk borne with the amount invested.

Moreover, purchasing life insurance as saving is less risky than other saving comes with a higher risk such as purchasing shares where economic fluctuation may bring losses [Shagrin (2002)].

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[5] put forward by Milton Friedman in 1957, published in J.S Duesenberry,(1947), *Income, Saving and the Theory of Consumer Behaviour*, Harvard University Press.
[6] Farrell J, (1997), *Portfolio Management:Theory and Application*, Second Edition, McGrawhill, pg 61-63

Premium (Price Of Insurance)

Purchasing life insurance is not for accumulating wealth [Matteo and Emery (2002)] but life insurance is perceived to be a mechanism to provide the family a safety net [Wharton and Harmantz (1989)]. However, a safety net should be within an individual budget, as too much spending on life insurance will be not worthwhile. For that reason, individual who planned his/her household expenditure will tend to planned on the price of life insurance that is the premium that need to be paid in order to gain the life insurance benefit but not in view of accumulating wealth [Matteo and Emery (2002)].

Premium payment will be continuous and for a long period commonly lasted for ten or may up to thirty years. The commitment paying the premium is always a burden to policyholders. Therefore, the price of insurance is an important factor that influences to purchase life insurance [Browne and Kim (1995)].

METHODOLOGY

The study was conducted by distributing 350 questionnaires to respondent from various cultures background in Kuching city area. The questionnaire constructed based on the selected three variables that is level of income, other savings and premium payment. Respondents are asked to answer three part of the questionnaire. Part A is query on respondents background that is gender, age, marital status, academic background, level of income and life insurance holdings.

Meanwhile, part B of the questionnaire is on respondents' opinion regarding life insurance. There are five relevant statements for each variable in view to test significant level of selected variables.
On the other hand, part C is an open-ended question whereby respondents are requested to give suggestion for insurance industry.

RESULT AND DISCUSSION

Out of 350 questionnaires distributed, only 322 questionnaires are returned and completed. Therefore the respond rate is 92%. Reliability tested on 30 questionnaires and showed that standard alpha item is 0.7626 indicating the reliability of the questionnaire.

Part A: Background Of Respondents

From graph 1, it is showed that the respondents are mostly female that is 51.6%. Age wise, majority of respondents are aged 25 years old and below (46%), followed by age 26-35 years old comprising 25% of respondents (refer to graph 2). Majority of respondents are married comprising 56.5% (refer to graph 3).
Meanwhile education background of respondents showed in graph 4 that majority of respondents hold high School Certificate and followed by 29% of respondents hold Diploma or STPM Certificate.
As shown in graph 5, The level of income of the respondents is mostly earned RM1000 to RM1499 as their monthly income. Only 17% earned more than RM2000 per month.
Majority of respondents (51.6%) hold life insurance whereby 9.3% bought the life insurance policy but terminated the policy before it matured. The other 39.1% respondents have yet to purchase any life insurance policy (refer to graph 6).

Part B: Obligation

From the result, it is showed in graph 7 that 13% of respondents are strongly agreed and 132 respondents agreed to the statement of premium payment of life insurance is a burden to them. Whereby only 8.1% of respondents did not agreed that premium payment is a burden to them. The respondents are from medium income earner as they are more committed to necessities of daily expenses rather than purchasing unforeseen benefit of life insurance. Education background my also cause to the result given that majority of respondents are only hold high school certificates.

Fixed Payment Period

Life insurance is required policyholder to pay monthly premium over number of years. The period is fixed according to face value and premium payment. The result showed that 146 respondents agreed and 21.7% strongly agreed that abiding monthly premium payment for fixed payment period is a burden to them. If they are unable to meet the date due of the premium payment, the possibility of their policy being terminated is evident (please refer to graph 7).

Lengthy Payment Period

A similar result showed in graph 7, that 70 of respondents were strongly agreed and 45.3% respondents were agreed that a long duration of premium payment is a burden to policyholder. The period of ten years or more is could be lengthy for some consumer to abide. Furthermore, consumers not only to remember when the monthly premium to be paid, consumers must remember the due date for a long period of time. The advantage of automatic deduction from salary is not available for all consumers. Therefore, many of respondents assume that they need to remember the dates and made the premium payment by themselves. It is understandable as a burden for them.

Continuous Payment

On the other hand, 13% of respondents strongly not agreed and 39.1% of respondents did not agreed to the statement that continuous payment of life insurance is a burden to them. This may due to continuous payment is similar to their hire purchase payment of car loan or house loan. Respondents may already experience or currently committed to continuous payment as such. For that reason, premium payment that needs to be paid continuously is regarded as usual phenomenon for many respondents (please refer to graph 7).

Terminated Policy If Fail To Pay

In graph 7 also describe that there were 20% of respondents strongly agreed and 50% of respondents agreed to the statement that experiencing life insurance policy been terminated would deter respondents to purchase life insurance again. The policy terminated may due to their inability to pay premium on time that may forced respondent would think twice to purchase another life insurance.

Monthly Saving

As graph 8 describe that 19.9% of respondents were strongly agreed and 49.1% of respondents were agreed to the statement that monthly saving would influence them in purchasing life insurance. Purchasing life insurance may act as monthly saving, which may give return as well as benefiting them from any great losses that may occur. However, if respondents were not view life insurance as an investment, monthly saving may not influence them.

Variety In Saving

From the result, 11.2% were strongly not agreed and 47.8% not agreed to the statement that variety of their saving will influence them to purchase life insurance. In fact, variety of saving will mean less money to spend. Respondents may view life insurance is benefiting them in protect them against losses rather than a medium of saving (please refer to graph 8).

Keen In Bank Saving

In graph 8 it is showed that there are 11.2% of respondents were strongly not agreed and 43.5% of respondents were not agreed to the statement that saving in bank would influence them to purchase life insurance. Respondents may view that saving in bank may act as a provision if there is emergency shortage for their daily expenses. On the other hand, respondents may view the life insurance in the function of protection against permanent losses such as disability or death.

Fear Of Other Saving Reduced

The result in graph 8 showed that 14.9% of respondent were strongly agreed and 44.1% of respondents were agreed that purchasing life insurance would reduce their other saving. Payment of life insurance is a fixed amount and continuously for a long period. Therefore, respondents were concern that committing paying the premium would consequently reduced their other saving. The other concern is that there is a probability that other saving may give a bigger return than return offered by life insurance if they opt to purchase life insurance as investment.

Advantage Of Interest In Bank

Majority of respondents that is showed in graph 8 that 53.4% of respondents not agreed that interest of saving in bank would gain more benefit (in term of interest) than purchasing life insurance. In fact, respondents are more concern on committing premium payment rather benefit derived from purchasing life insurance.

Fixed Monthly Income

Majority of respondents were agreed (50.3%) and other 22.4% were strongly agreed that fixed income is vital in consideration of purchasing life insurance. In view of premium payment is fixed and continuous, fixed monthly income will influence them to purchase life insurance. Without fixed income, it will be difficult for them to abide premium payment, which is fixed, continuous, and for a long period of time. Inability of abiding the commitment of premium would consequently life insurance policy terminated and it will be another loss for them (please refer to graph 9).

Additional Income

Majority of respondents were agreed (47.8%) that additional income would influence them to purchase life insurance. However, there were 32.9% did not agreed to that statement in view of the fact that life insurance is not accumulating wealth but for protect oneself against losses (please refer to graph 9).

Low Level Of Income

Level of income is proven in many previous research is a factor influencing demand of life insurance. From this study 46% of respondents agreed to the statement that low-level income would influence the purchase of life insurance. Only 7.5% of respondents were strongly not agreed to the statement. It is possible that higher level of income will be more interested in purchasing life insurance as life insurance may act as an investment as well as to protect policyholder and family (please refer to graph 8).

Daily Expenses

In graph 9, it showed that 47.8% of respondents were not agreed to the statement that budget for daily expenses is the key element to consider in purchasing life insurance. However, there is 31.7% were agreed that daily expenses important for them when deciding to purchase life insurance. Majority of respondent may view purchase of immediate necessities such as food and children's expenses, is as important as life insurance payment.

CONCLUSION

This is only an empirical study on purchases of life insurance among residents in Kuching, Sarawak. Regarding payment of life insurance premium, majority of respondents were agreed that life insurance is a burden to them. Premium payment that is fixed monthly payment, and committed to pay premium in long period of time is evidently a burden that act as a barrier for them to purchase life insurance.

In view of other saving such as saving account in bank is not a factor that will influence them to purchase life insurance. However, majority of respondents agreed that monthly saving might influence them to purchase life insurance as life insurance may act as an investment.

It is evidently showed that level of income especially fixed income earner would purchase life insurance. Obligation for daily expenses, surprisingly were not agreed as a factor for consideration in purchasing life insurance.

REFERENCES

Dorfman M S, translated by Ismail Z I (1993), *Pengenalan kepada Insurans.* Kementerian Pendidikan, Kuala Lumpur.

Farrell J, (1997), *Portfolio Management: Theory and Application*, Second Edition, McGrawhill, pg 61-63

http://www.liam.org.my/liam/homepage/CHART.html (Date of access 1/11/2003)

http://life.insurance.com/profiles_insights/hot_topics/article_0602_6.asp (Date of access 1/11/2003)

Hwang T, 2003, *The Determinant Of The Demand For Life Insurance In Emerging Economy –The Case Of China,* Managerial Finance, Vol 29, Number 5/6

JDWharton and HR Harmantz (1989), *An Explanatory Investigation On How Attitudes Related To Life Insurance Holdings: A Cross-Cultural Comparison.* Journal of Psychology 10

Kantor Shawn Everett & Price V Fishback (1996), *Precautionary Savings, Insurance And The Origins Of Worker's Compensation*, Journal of Political Economy

Karl Borch, 1980, *Life Insurance And Consumption*, Economics Letters Volume 6, Issue 2, Pages 103-106

Livio Di Matteo and J. C. Herbert Emery, October 2002, Wealth *And The Demand For Life Insurance: Evidence From Ontario, 1892,* Explorations in Economic History, Volume 39, Issue 4
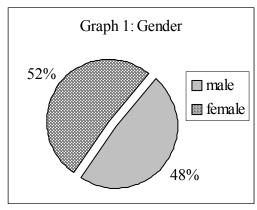
M. J. Browne & K. Kim, May 1995, *An International Analysis Of Life Insurance Demand.* Insurance: Mathematics and Economics Volume 16, Issue 2, Page 180
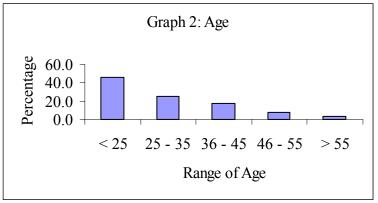
Michael G Palumbo. *Estimating The Effects Of Earnings Uncertainty On Families' Saving And Insurance Decisions,* Southern Economic Journal. Stillwater: Jul 2000. Vol. 67, Issue 1; pg. 64,
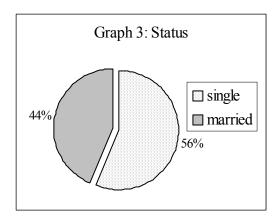
Steven S Shagrin. Summer 2002, *Retirement Saving And Financial Planning: Different From A Decade Ago,* Generations. San Francisco: Vol. 26, Issue. 2, pg. 40
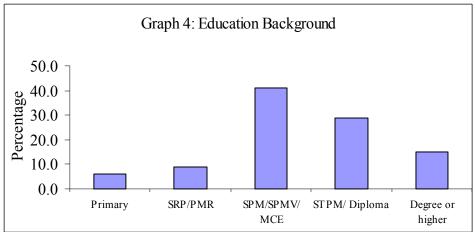
The Economist; Finance And Economics: *New lease on life; Insurance* London; May 17, 2003; Volume: 367 Issue: 8324

APPENDIX

Graph 1: Gender

Graph 2: Age

Graph 3: Status

single 56%
married 44%

Graph 4: Education Background

Graph 5: Income of respondents

Graph 6: Policy status

bought but terminated 39%
bought 52%
not yet 9%

Graph 7: Perception on premium payment

Graph 8: Life insurance vs saving

Graph 9: Income and expenses
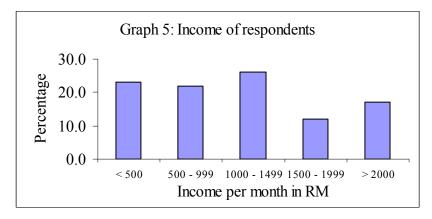
Protecting Businesses: The Ignorance Towards Businesses Insurance?

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ABSTRACT

Disaster or accident may burden a company financially and emotionally. Therefore, it is suggested that companies to purchase insurance policy to protect their business. However, it is quite cumbersome for the business owners as there are many policies to be chosen to protect their business. On the other hand, there are also few underlying factors that cause business owners reluctant to purchase an insurance policy as one of a crucial protective measure for their businesses. For this study, all the relevant data was collected by randomly distributing 200 questionnaires to companies registered in Kuching city. The data then was tested using Chi square test to determined significant relationship between insurance purchased with type of company and insurance purchased with type of trading. It was then analysed descriptively using graph, percentage and frequency in explaining companies' biography and reasons companies reluctant to purchase insurance. The result shows that variable selected (type on companies and type of trading) has significant relationship with purchasing insurance to protect their company. It is concluded majority of respondents perceived that least risk is the main reason they did not purchase any insurance for their company. The study also includes suggestions to improve the product and insurance industry.

INTRODUCTION

Insurance is defined as an economic entity that is mutually formed in order to create a fund, the need for which arises from risk occurrences of nature, whose probability can be fairly estimated (Merapan et al, 2001). Its primary function is distributing equally losses of few policyholders among the total number of policyholders.

Most of the time, a business common objective is to maximise profit and minimise losses. Losses not only arise from bad business transaction but also may in term of unexpected event such as theft, fire, flood and others. Losses as such in the first place can be minimised by purchasing at least a business insurance policy, as the policy would at least rel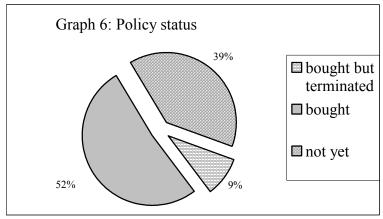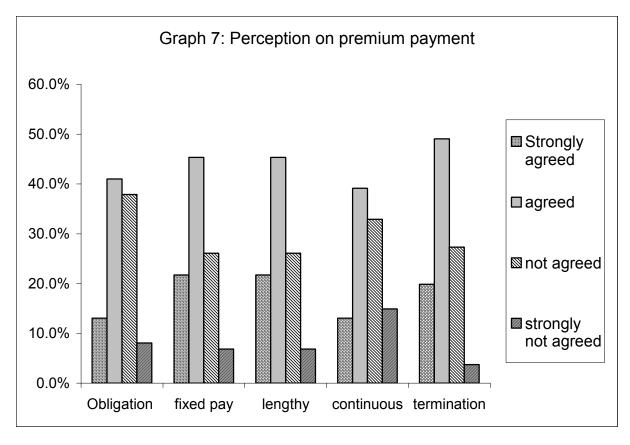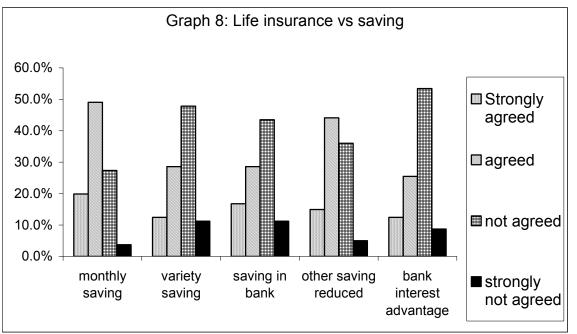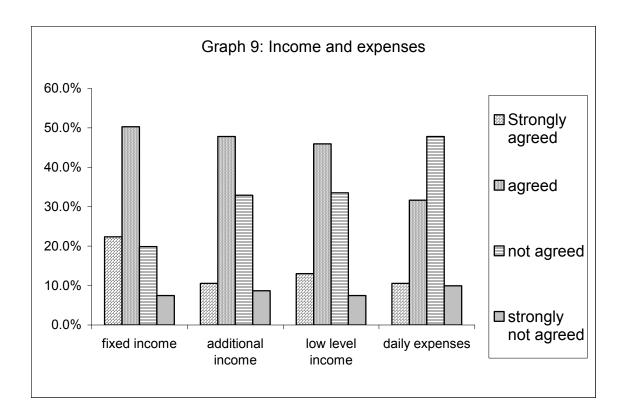ieve the anxiety (Merapan et al, 2001). Thus managers or business owners may concentrate on enhancing their business rather than distressing about any inconvenience that might occur due to those unexpected losses. Thus, business insurance should be perceived and treated as to minimising the unexpected losses impact and indirectly will help to promote business transaction in positive way.
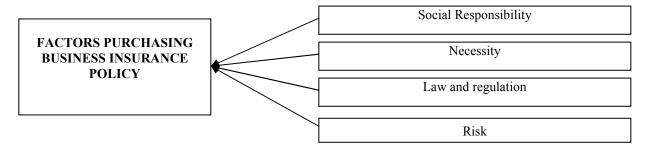
Business insurance fall into two types of categories, that is property insurance and liability insurance. Property insurance is created to protect against losses that is related to business' property. Property that would be covered by the insurance are business premises, construction works, cargos, machineries, motor vehicles, computers, electronic equipments and others. The policy offered such as insurance policy against fire and theft.

On the other hand, liability insurance is protecting the businesses against losses related to third party liability litigation. In this study, liability insurance is separated into two parts that is professional liability and other third party liability insurance. The professional liability insurance usually covers expenses related to defending a professional, such as solicitors, medical practitioner and architects; against a malpractice claim. It's include all costs associated with a judgment or settlement[1] e.g. investigation costs, attorney fees, expert witness fees and indemnity payment that are The third party liability insurance is created for third party claim against financial harm business, that are not arises from professional business activities such as tort claim against construction business. This policy will ensure that any third party claim is payable even though the business (policy holder) has insufficient fund to comply with the claim.

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[1] Extracted from seminar on Professional Liability Insurance Issues for CRNAs by Louise E. Hershkowitz

CONCEPTUAL FRAMEWORK OF THE STUDY

Figure 1: Conceptual Framework

This study is based on conceptual framework as shown in Figure 1 above. The absent of literature review that study business insurance purchasing as a whole, increase the difficulty of this study to follow any specific model theory of behaviour in purchasing business insurance. However, the above-mentioned conceptual framework is derived from various past literatures that are relevant. By combining these literatures, it can be concluded that factors in purchasing business insurance are influenced by business awareness towards social responsibility, necessity, abiding law and regulation, and to minimise business risk such as losses cause by fire.

Business insurance should be perceived as one of promoting business awareness towards social responsibility. In this study, social responsibly means business insurance will not only protecting business revenue but also the public. For example, whenever a business premise is caught with fire, the possibility of the fire to affect other premises is evident (Riegel, Miller & William, 1993). Yet, only few business operators are aware of this social responsibility. Perhaps, separate entity concept whereby business owner is separated from business, social responsibility issues appears insignificant to the business. Some may be ignorant to the situation and reluctant to purchase insurance against losses cause by fire.

On the other hand, business insurance should be regarded as a necessity of the business due to unexpected losses that will cost the business operation and also to its employees (Anastasio, 2000). It is unacceptable as many business reluctant to be reminded that their businesses could be strike by natural disaster without warning. The employee theft (Greenberg J, 2002) and customer theft would cause financial burden to businesses. In recent years, Identity (ID) theft and credit card theft becoming a new version of business loss. In US alone, ID theft causes economic losses of one billion each year to US lenders[2]. Protecting business intellectual property is perceived essential to businesses as reported many attempt to steal the intellectual property in US (Hancock B, 1999). The alarming number increases of those theft cases influence businesses to take actions protecting their assets.

Law and regulation is always the best method in directing business to behave in certain ways. Obligation as such will put pressure for businesses to purchase business insurance in order to avoid unnecessary litigation costs (Dinsdale & McMurdie, 1993). For example, all heavy industries must protect their employees in term of purchase insurance or contributing in such funds that is inclusive similar benefits. Thus, an absent of law and regulation, many businesses will be reluctant to purchase business insurance especially small enterprise. The common argument is their small revenue will not afford premium payment.

It is unarguable that any business should be protected against unexpected financial losses that could force business to file for insolvency (Anastasio, 2000). In view of losses that are caused by natural disaster such as flood, hurricane or fire are regarded as unexpected financial losses (Zagaski, 1993 and Dorfman, 1993). Even though businesses must comply the prescriptive fire safety codes and ranking evaluation of fire risk appear minimal, business should not ignore the possibility. Either big size firm or small entrepreneur will be financially effected if involve in such disaster. Furthermore, the risk of fire to industries that manufacture or warehousing flammable products (Kalfakakou R, Katsavounis S & Tsouros K, 2003) such as petrol stations, wood based products, chemical products and others.

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[2] Extracted from article title ID theft cost lenders $1 billion, published in Computer Fraud and Security Bulletin, Elsevier Science Ltd, page 2

METHODOLOGY

The study was conducted by distributing 200 questionnaires randomly to business manager or business owner that operate its business in Kuching city area. Kuching is selected as it is the centre of businesses in Sarawak and many type of businesses established in the city for number of years.

Respondents were asked to answer two part of the questionnaire. Part A is to examine companies' background that is type of company, company's year establishment, ownership and type of business trade. Meanwhile, part B is concentrating on respondents' opinion regarding business insurance including the reasons to ignore the importance of purchasing business insurance policy.

Based on the conceptual framework and data collected, two hypothesis constructed and tested as follows:

H_o1: Business type will not influence the type of business insurance policy purchased

The selection of insurance policy should be relative to the needs of business to protect business. Business awareness to their exposure to business risk or natural disaster would influence them to select the policy best suited to protect them against those risks. For example, restaurants or bakeries should be more suitable to purchase fire policy rather than third party liability. Hence, the test would confirm the statement.

H_o2: Form of business will not influence the decision towards purchasing business insurance policy.

Businesses with form of holding are assumed to have the capability to make their decision on their own, including decision to purchase business insurance. Therefore the responsibility in protecting the business is on their own hands. However, it is a norm that business subsidiaries will only be able to make decision of business insurance premium payment with a prior approval from by their headquarters. As a result, this hypothesis is to examine the whether decision-making process in the business will influence the purchase of business insurance policy.

These hypotheses will be tested and analyzed using chi square test to determine the significant relationship between the dependents (purchasing of business insurance policy)and independents variables(business type and form of business).

RESULT AND DISCUSSION

A pilot test was conducted to verify the reliability of questionnaires distributed. With standard alpha item of 0.7707, the questionnaires were proven reliable for this study. Even though 200 questionnaires were distributed, only 119 were returned by the respondents. Therefore the response rate is 59%. After detail scrutinize, only 104 are usable to be tested as the other 15 are incomplete.

Graph 1 shows that, majority of the business respondents are in a form of corporate comprising 58% of total respondents. As described in graph 2, majority of the respondents are in professional service industry such as solicitors and clinics comprising 38.5% of the total respondents. This is followed by construction business type that is 27.9%. Others (20.1%) are inclusive restaurants, bakeries, car garages and single or multi-good distributors.

Regarding the experience of businesses in the market, majority of the respondents commencing the business less than 5 years that is 38% (refer graph 3), followed by between 6 to ten years operating the business in the market. Very few established more than twenty years that is only 7% of the total respondents.

Owner or board of directors of the company is the responsible entity in deciding purchasing business insurance. Therefore, the study examines respondents' form of ownership. From the graph 4, it showed that majority of respondents are reliable in making their own decision independently, that is inclusive purchasing business insurance to protect their business.

Majority of respondents that is 57% (59 companies) already purchased business insurance. Nevertheless the other 43% is yet protecting their company by purchasing any kind of insurance (please refer graph 5). The most popular type of policy purchased by businesses is fire that comprises 41% of total respondents who owned an insurance policy. The second popular insurance policy purchased is liability comprising 32%, theft and third party liability policy, both comprising 10% (please refer graph 6).

On the other hand, those 45 companies that do not hold any insurance policy gave out number of reasons. According to graph 7, majority of the respondents said that their company has least risk of loss or damaged. These 12 companies assume that the risk of theft or fire or other risks is too small compare the insurance payment that could be a burden to them. Another 22% of them regarded business insurance are unaffordable for them and 23% said that it is not necessary. Surprisingly, there are six companies said that they have never considered purchasing business insurance. Other reasons inclusive negative perception towards the insurance itself and lack of knowledge insurance.

As illustrate in Table 1, the chi-square test result is significant for the first hypotheses. Consequently, it is concluded that different business type will purchase different type business insurance policy. Business that provides professional services such as clinics, solicitors and accounting firms are aware of its risk on liability on services offered and property liability is greater. The business would probably confident with the ability of insurers to pay out compensation whenever the business incurs the losses (Cummins, Doherty & Lo, 2002). Therefore, protection against this risk is perceived essential to the business. Further, given that businesses offers professional services acquire expensive fixed assets and massive important data stored in the premise of management offices, fire policy regarded as another important policy to be purchased.

There is insufficient evidence to reject the second null hypothesis. As demonstrate in table 2, the chi-square tested on the hypothesis appear insignificant value. Hence, it is concluded that the form of ownership is not influence the business to ignore business insurance policy. Even though, majority of respondents are holding form, it is inconclusive that respondents is independently responsible in decision making including decision in purchasing business insurance.

CONCLUSION

Insurance should be practice and not only be perceived as a form of funding to lessen the losses that could incur by the policyholder. Every businesses are responsible not only making profit to its owner but to protect employees and possibly the public that could be affected due to losses or damaged upon the business.
The ignorant businesses towards its corporate social responsibilities force them to ignore the benefit embedded in business insurance policy. It is proven in this study that there are still few companies, which are reluctant to purchase business insurance, regarded them as unnecessary. Conversely, insurance companies perhaps could offer more attractive and affordable business insurance policy especially to small entrepreneurs to protect their businesses against losses or damage.

REFERENCES

Anastasio, S., (2000). Small Business Insurance and Risk Management Guide. www.sbaonline.sba.gov/library/pubs/mp.28.txt

Dinsdale, W. A., & McMurdie, D.C., (1993). Unsur-unsur Insurans. Dewan Bahasa dan Pustaka, Kuala Lumpur.

Dorfman, M. S. (1993). Introduction to Risk Management and Insurance. Prentice Hall, New Jersey.

Merapan, S., Tumin, M.H., Tan, L. H., Supramaniam, R., & Segaram, S.G., (2001). The Pre-Contract Exam for Insurance Agents. The Malaysian Institute, Kuala Lumpur

Riegel, R., Miller, J. S., & Williams, C. A. Jr., (1993) Prinsip dan Amali Insurans Harta dan Liabiliti. Dewan Bahasa dan Pustaka, Kuala Lumpur.

Zagaski, C. A. Jr., (1992). Environmental Risk and Insurance. Lewis Publisher, London

Cummins JD, Doherty N & Lo, A, (2002), Can Insurers Pay The "Big One"? Measuring The Capacity Of The Insurance Market to Respond to Catastrophic Losses, Journal of Banking and Finance, Vol. 26, pp 557-583

Greenberg J, (2002), Who Stole The Money, And When? Individual And Situational Determinants Of Employee Theft, Journal of Organisational Behaviour and Human Decision Process, Vol. 89, pp 985-1003
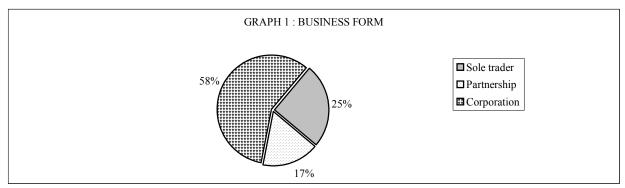
Kalfakakou R, Katsavounis S & Tsouros K, (2003), Minimum number of warehouses of storing simultaneously compatible products, International Journal of Production Economics, Vol. 81-82, pp 559-564
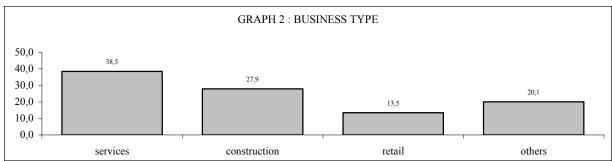
Hershkowitz L, (2004), Professional Liability Insurance Issues for CRNAs, seminar hosted by Pennsylvania Association of Nurse Anesthetists, Hershey, Pennsylvania
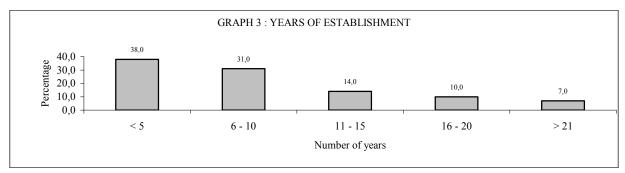
Computer Fraud and Security Bulletin, Elsevier Science Ltd, page 2
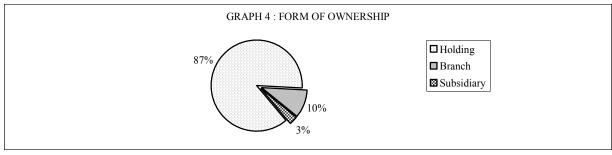
Hancock B, (1999), Internal Information Theft In US On The Rise; Security Views, Computers and Security Bulletin, Vol. 18, page 184

APPENDIX

GRAPH 1 : BUSINESS FORM

Sole trader 25%
Partnership 17%
Corporation 58%

GRAPH 2 : BUSINESS TYPE

services 38,5
construction 27,9
retail 13,5
others 20,1

GRAPH 3 : YEARS OF ESTABLISHMENT

< 5 : 38,0
6 - 10 : 31,0
11 - 15 : 14,0
16 - 20 : 10,0
> 21 : 7,0

GRAPH 4 : FORM OF OWNERSHIP

Holding 87%
Branch 10%
Subsidiary 3%

GRAPH 5 : PURCHASED BUSINESS INSURANCE

yes 57%
no 43%

GRAPH 6 : TYPE OF POLICY

GRAPH 7 : REASON NOT TO PURCHASE
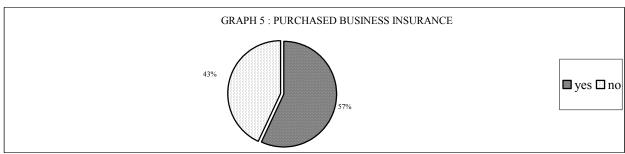
Table 1: Chi-Square Tests on Hypothesis 1

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.933(a)	15	.002
Likelihood Ratio	36.744	15	.001
Linear-by-Linear Association	1.165	1	.280
N of Valid Cases	59		

Note: (a) indicates 19 cells (79.2%) have expected count less than 5. The minimum expected count is .05.

Table 2: Chi-Square Tests on Hypothesis 2

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.475(a)	8	.176
Likelihood Ratio	13.409	8	.099
Linear-by-Linear Association	.001	1	.976
N of Valid Cases	45		

Note: (a) indicates 12 cells (80.0%) have expected count less than 5. The minimum expected count is 1.16.

Exploring the Effects of Customer-Orientation Behaviour on Insurance Agent's Performance

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ABSTRACT

The topic of customer-orientation has increasingly attracted interest in academic marketing research as well as in practice. As a specified type of behaviour exhibited by organization members such as salespeople, it is commonly defined as practicing the marketing concept at the level of the individual salesperson has become a prime variable of interest for organizations wishing to improve long-term relationship with customers. Although the utilization of customer-orientation behaviour has been aggressively promoted by many organizations, a complete understanding of the process is presently lacking. Investigates the effect of customer-orientation behaviour on individual insurance agent's performance. The results show a positive relationship exists between customer-orientation behaviour and annual income as well as subjective evaluation of performance. Despite the positive relationship, the variance explained was very small. On the other hand, customer-orientation behaviour was found to be unrelated to sales target achievement. Results are compared with earlier findings and implications for future research are discussed.

INTRODUCTION

An important trend in personal selling activities is the shift toward enhancing sales performance through the implementation of longer-term, customer-oriented strategies. As this concept of customer-oriented selling has grown in popularity in the sales and sales management research interest, many companies have realize that this relational approach to buyer-seller interaction is crucial for long-term success (Marin and Bush, 2003). The concept of customer-orientation evolved from the marketing concept (Saxe and Weitz, 1982) which was introduced as a management philosophy asserting that companies should continuously coordinated their activities in an attempt to satisfy customer needs and companies objectives simultaneously (Slater and Narver, 1994). Therefore, customer-orientation behaviour is concern for the customer, diagnosing customer needs, striving to establish long-term customer satisfaction and actively assisting customers when problems or questions arise (Martin and Bush, 2003). In this case, salespeople practice the marketing concept by trying to help their customers make purchase decisions that will satisfy customer needs (Saxe and Weitz, 1982). Salespeople that are highly customer-oriented typically engage in behaviours conductive to long-term customer-satisfaction (Howe et al., 1994). Saxe and Weitz (1982) argue that a customer-oriented approach should be used when: (i) service providers can offer a range of alternatives and have the expertise to assist the customer, (ii) customers are engaged in complex buying tasks, (iii) a cooperative relationships exists between the salespeople and customer and (iv) referrals and repeat sales are important source of business. Given the criteria above, it is readily apparent that insurance agents should be actively engaged in customer-oriented selling behaviour in order to develop mutually beneficial relationships (Howe et al., 1994).

LITERATURE REVIEW

Despite the apparent importance of customer-orientation in selling activities, research on the construct has been limited. At the organizational level, researchers working at organizational level have identified several organizational outcomes of customer-orientation (e.g. Kohli and Jaworksi, 1990; 1993; Narver and Slater, 1990). They argued that firms which focus on their customers' needs are better positioned to achieve long-term success than companies that do not (Deshpande et al., 1993; Kotler, 2000). Appiah-Adu and Singh, (1998) indicated

customer-orientation calls for a company to understand and satisfy the customer's needs and it is assumed that by doing so the firm will reap rewards in the form of profits. Indeed empirical research has demonstrated several positive outcomes of a customer-orientation, including enhanced profitability (Narver and Slater, 1990), employee commitment and esprit de corps (Jaworski and Kohli, 1993).

Besides the outcome of customer-orientation on company's profit and business performance, previous studies demonstrated customer-orientation gives impact on employees' commitment and esprit de corps. The relationship was investigated by Jaworski and Kohli (1993) and they discovered that the greater the customer-orientation of the firm, the greater the esprit de corps and organizational commitment of employees. It appears that customer-orientation nurtures a bonding between employees and the organization as well as promotes a feeling of belonging to one's big organizational family dedicated to meeting and exceeding market needs and expectation. In conclusion, most of the studies have showed customer-orientation leads to improved business performance. Companies benefit a lot if they adopt the marketing-orientation in their operation.

At the customers level, a salesperson adoption of customer-orientation behaviour is directly related to customer satisfaction with the salesperson and indirectly to satisfaction with the firm (Goff et al., 1997). They found customer-orientation influenced customer satisfaction with the salesperson, dealer, product and manufacturer in a sample of new car purchasers. In Malaysian environment, Chee and Peng (1996) examined customer-orientation and buyer's satisfaction for high involvement product, that is house. They found all the seven dimensions of customer-orientation that is ability to fulfill buyers needs, responsiveness, assistance to buyers on purchase, industry knowledge, the environmental factor, after sales service and product quality are significant in determining buyers' satisfaction. This is consistent with the assertions by Kotler (1988) and Kohli and Jaworski (1990) that the satisfaction levels of buyers are influenced by the perceived levels of customer-orientation in the selling organization.

A good perception given by customers result from salespeople's customer-orientation also demonstrated by Brady and Cronin (2001). They discovered employees with customer-orientation has a positive influence on customer perceptions and ultimately the performance of firms. In this instances, customer-oriented firms were consistently perceived as having better quality of physical goods and employee performance. In fact, customers tend to view customer-oriented firms as having more success in the execution of their market strategies. This supports Parsons's (2002) study that customer perceptions of salesperson customer-orientation are positively related to relationship quality, that is trust and satisfaction with the product offered.

Williams (1998) examined the influence of salesperson customer-oriented behaviour on the development of buyer-seller relationships among organizational buyers. Findings from their study indicated a strong and significant influence between customer-orientation behaviour of salespeople and development of customer relationship. The finding is supported by Jones et al. (2003) that salesperson's customer-orientation behaviour plays an important role in retaining customers. In fact, they found a strong salesperson's customer-orientation tends to reduce the buyers' switching behaviour in a business-to-business context.

Customer-orientation behaviour is also associated with development of trust and the degree of satisfaction with the relationship between salespeople and customers. This is demonstrated by Kim and Cha (2002) that a customer-orientation behaviour of hotel employees was positively related to relationship quality, that is customer perceptions and evaluations of individual service employees' communication and behaviour, such as respect, courtesy, warmth, empathy and helpfulness. Salespeople with customer-orientation behaviour found to be significantly related to ethical behaviour where customer-oriented agents found to be less likely participate in unethical activity (Howe et al.,1994).

Based on discussion above, marketing scholars investigating the nature and outcomes of customer-orientation behaviour from the perspective of customers have generally report findings in support of a positive relationship between customer-orientation and the development of buyer-seller relationships (Dunlap et al., 1988; Williams and Attaway, 1996) as well as trust and satisfaction with the company (Goff et al., 1997). Numerous studies also examined the consequence of customer-orientation on individual sales person and generally associate it as important characteristics of high performers (Keillor et al., 2000). According to Taylor (1986), "a customer-orientation is the high performer's biggest trait" and a customer orientation is important in both the industrial and consumer goods marketing arenas. Further support for the importance of customer oriented selling is provided by the contention that successful sales representatives identify having a "client orientation as the secret of their success" (Bragg, 1986). Also, MacKay (1988) believes that the "best" salespeople are genuinely interested in their customers and that sales representatives sell to people not computers, therefore they must know the buyer's goals. Additional support for the

necessity of customer-oriented selling comes from Peterson (1988) who contends that successful salespeople work to satisfy the needs of the customer.

In spite the contention that customer-orientation as characteristics of professional salespeople, studies undertaken have extend the growing body of literature identifying customer-orientation as antecedent variable for developing and sustaining buyer-seller relationship. This is demonstrated by Schultz and Good (2000) on the influence of customer-orientation on long-term buyer seller relationships among industrial products salespeople. They found customer-orientation was associated with long-term relationships orientations of the salespeople. Keillor et al. (1999) on the other hand found that among three aspects of relational selling, only customer-orientation behaviour and service orientation were positively related to performance satisfaction among professional sales people.

Despite various studies attempt to establish customer-orientation and job responses and attitudes linkages, yet past research examining the relationship between customer-orientation behaviour with individual salesperson's performance level is scant and produced mixed findings (Howe et al, 1994; Roman et al., 2002). For example, Saxe and Weitz (1984) found partial supports of the relationship between customer-orientation and sales performance. Similarly, Brown (1988) found customer orientation positively impact performance only when the purchase cycle occurs once per week or more often and when the purchasing agent is less than forty, a college graduate, and has 12 or more years of experience. Later, using insurance sales agents in a Western state in the US, Howe et al. (1994) found no significant effect of customer-orientation behaviour and sales performance.

While studies discussed above found inconclusive results regarding customer-orientation and performance relationship, Keillor et al. (2000) demonstrated among three dimensions of relational selling characteristics (customer-oriented selling, adaptability and service orientation), only customer-orientation was a significant predictor of performance, neither adaptability or service orientation were found to be significant, although each did show a positive relationship with actual performance of individual sales people from members of the nationwide professional sales organization. This leads them to conclude that customer-orientation issues should play an important part in any sales training and development program. In retail setting, Boles et al. (2001) discovered that customer-orientation was positively related to performance. This is consistent with evidence from other industries, such as industrial sales people (Swenson and Herche, 1994) and residential real-estate sales people (Dunlap et al., 1988). In fact in SME enterprise, Roman et al. (2002) also discovered customer-orientation behaviour has a positive influence on salespeople's performance.

From the performance perspective, it appears that a salesperson often benefits from utilizing a customer-orientation selling approach. Recently, Donovan et al. (2004) demonstrated that in addition to customer-orientation's effect on performance, it has strong effects on several employee job responses. They found that in financial institution, as the employee's level of customer-orientation increases, his or her level of job satisfaction, organizational commitment and the performance of OCB-altruism increases.
Although most of the published sales literatures deal with this topic states that customer-orientation behaviour is mandatory for the professional salesperson, Keillor et al. (2000) noted existing literature does not empirically address the critical issues of the impact of one's customer orientation on that individual's performance. They further emphasized that if salespeople do not believe that customer-oriented sales practices will positively affect their individual sales performance, they will unlikely to engage in such practices for fear that they will suffer from sales declines. Thus, it is imperative that empirical research be conducted that examines issues regarding the customer-orientation and sales performance relationship.

In addition, available evidence indicates that the relationship between customer-orientation behaviour and performance has led to mixed findings. There are several studies produced positive relationship whereas a few shown so significant relationship. Of course, that could be industry specific (Boles et al., 2000), which therefore lead Roman et al. (2002) to suggest that further research is needed by taking into account different selling environments. It seems that the nature of the customer-orientation behaviour and performance relationship is still in doubt and that it warrant further testing. Since this study involves individual insurance agents as unit of analysis and due to the fact that salesperson performance is critical issue in insurance industry, thus, it would seem imperative that empirical research conducted on issues regarding the customer orientation and sales performance relationship.

HYPOTHESES

The issue of salesperson performance has been addressed in a number of studies in the sales management literature (Churchill et al., 1985). However, the results found were somewhat contradictory, resulting in an incomplete understanding of performance issues in sales (Oliver and Anderson, 1994; Churchill et al., 1985). In an attempt to remedy the situation, this study further investigates the issue. The hypotheses to be tested in this study are as follows:

> Hypothesis 1: Customer-orientation behaviour is positively related to annual income.
> Hypothesis 2: Customer-orientation behaviour is positively related to sales target achievement
> Hypothesis 3: Customer-orientation behaviour is positively related to subjective performance rating.

METHODOLOGY

The sample for this study was full-time life insurance agents. Sixteen major life insurance companies were sent a brief explanation of the study. This was followed up by a telephone call to obtain their cooperation with the research. Of the companies contacted, ten willing to participate in the study. The questionnaires with cover letter were sent to 1000 life insurance agents through each company. Of these, 520 were returned representing a response rate of 52 percent. In total, 445 questionnaires were deemed useful for data analysis. The agents were primarily male (72%), less than 40 years old (66.4%), acquired Malaysian Education Certificate (SPM) or diploma (83.2%) and have working experience less than 5 years in the life insurance industry (60.2%).

Test of Non-Response Bias

As is the case in any study relying on voluntarily participation, there is always the possibility that respondents and non-respondents differ in some significant manner. Due to the difficulty associated with the identification of non-respondents' characteristics in anonymous research, an alternative test of non response bias was conducted. According to Armstrong and Overton (1977), non-respondents were assumed to have similar characteristics to late respondents. This procedure involves breaking the sample into early responses (that is, returns received within a month after distribution, before any follow-ups) and late responses (those returns received after a month of distribution, after follow-ups) and then conducting the *chi-square test* on the demographic characteristics of the respondents. There were 133 respondents classified as early responses and 312 late responses. Table 1 displays the result of the non-response test. The p values of the analyses revealed no statistically significant difference between the two groups (significant level $p \leq 0.05$). Thus, we can conclude that non-response bias will not significantly affect the generalizability of the findings of this study. Therefore, the analysis was carried out on the full 445 responses.

Table 1: Results of Chi-square Test

Profile	Value
Gender	0.26
MDRT membership	0.55
Academic qualification	0.89
Age	0.06
Experience in the present company	0.13
Experience in the industry	0.58

RESEARCH DESIGN

This study is a correlational in nature, which was conducted for obtaining a good grasp of the phenomena of interest, that is customer-orientation behaviour and advancing knowledge through subsequent hypotheses testing. Basically, this study was a cross-sectional study in which data was gathered just once, in order to answer the research questions. A survey method was employed since survey research is best adapted to obtain personal and social facts, beliefs, and attitudes (Kerlinger, 1973). The unit of analysis for this study was the individual salesperson limited to individual who works as full-time life insurance agent in Malaysian insurance companies and treating each agent's response as an individual data source. A single industry, that is insurance was examined because previous studies

indicated that findings relevant to salespersons are directly influenced by the selling situations (Honeycutt et al., 1995; O'Hara et al., 1991).

The study population consists of full-time insurance agents working in life insurance companies in Peninsular Malaysia. Until the end of 2003, statistic from LIAM showed that there are currently 83, 720 registered life insurance agents working in local and foreign-based companies in Malaysia (UPDATE, 2003). An important characteristic of the sampling frame was to select the sales agents who work on full-time basis and worked with the organization for more than a year. Only full-time life insurance agents were included in this study to eliminate differences between full-time and part-time agents (Leong et al., 1994). For instance, Diefendorff et al. (2002) found part-timers feel that their jobs are less important to them and that they are less integrated into the organization.

The requirement to select only those with more than a year experience was necessary to ensure that all respondents have some knowledge and experience in sales jobs, so that they were able to answer the questionnaire accurately. Furthermore, with more than a year experience, they are able to determine their performance, in terms of annual income and target achievement. Therefore, these two characteristics were control in the present study.

MEASURING INSTRUMENTS

Measurement of the construct used in this study involved employing a combination of existing survey instruments. Cronbach's alpha is most used to test the reliability of a multi-item scale (Kim and Cha, 2002). The cut off point is generally 0.6 (Hair et al., 1998). Respondent-generated performance measures have been used in sales research (e.g., Behrman and Perrault, 1982, Dwyer et al., 2000) and were used in this study. The sales agent's performance measures used in this study comprised of objective and subjective measures as reported by the insurance agent. These two types of measures were used in response to Tyagi's (1985) future studies suggestion to employ both objective and subjective measures of performance in measuring salesperson performance.

Objective performance measures are represented by open-ended questions on percent target quota achieved and annual income (commission/bonus) earned. This is a similar method used by Boorom et al. (1998), Dwyer et al. (2000) and Nik Mat (1995) in their study of insurance agents. Subjective measure is presented in performance rating format. This dimension consists of four self-rating items on a five-point scale. Respondents were asked to rate themselves relative to other agents in their groups in terms of their ability to generate higher sales commissions, exceeding sales targets, generating new clients, maintaining a good relationship with existing clients and overall selling performance.

In insurance industry, agent's pay is determined solely on the basis of performance (MacKenzie, Podsakoff and Ahearne, 1998). The performance of salespersons in the insurance business is commonly measured by commissions paid based on new business generated or based on quota attainment (Boorom et al., 1998; Nik Mat, 1995). The salaries of insurance agents consist of individual commissions based on the amount of total sales. Hence, annual income accurately reflects sales performance. The amount of commission earned contribute to a large part of the total annual income of the sales agents. The greater sales they produced, the more commission they earned and therefore the more the annual earnings of individual sales agents. Quotas are set targets of annual sales that should be achieved by sales agents. Sales agents are expected to use their ability, personality, skills, motivation and organizational backups to achieve these quotas or set targets (Nik Mat, 1995). Other research using insurance salespeople as subjects found annual income and sales target achievement to be an appropriate indicator of sales outcomes (Boorom et al., 1998; Dubinsky and Hartley, 1986; Nik Mat, 1995).

The measure of annual income earned and sales target achievement are outcome-related items which address the end result of a salesperson's efforts (Dwyer et al., 2000; Low et al., 2001) and are appropriate for evaluating the sales of insurance where salespeople have considerable control over their activities and hence their results (Cravens et al., 1993; Dwyer et al., 1998). For annual income, respondents were asked "what is your personal annual income (including bonus and commission) in the year 2002?" To measure sales target achievement, respondents were asked to indicate the percentage of actual sales achieved and their sales target for 2002. In Malaysia, due to the large number of sales agents, it was not possible to get this information from company records (Nik Mat, 1995). The researcher then calculated the percent of sales target achieved.

Literature reviewed found no concrete evidence as to the different impacts of performance obtained from self-report and company report sources (Churchill et al., 1985; Nik Mat, 1995); therefore, this method is deemed appropriate for subsequent analysis. The subjective measure for this study was adapted from Dwyer et al. (2000). It requires

respondents to evaluate their relative performance within the sales organization (with 1 indicating far below average to 5 indicating above average). The measure was a summated scale comprised of the average of five direct, outcome-related items as reported by the insurance agent: sales commissions earned; exceeding sales objectives and targets; generating new-customer sales; maintaining a good relationship with current-customer and overall selling performance. Dwyer et al. (2000) had used the instrument to measure respondent-generated performance among insurance agents and they found the reliability coefficient (Cronbach alpha) of .81 for this construct. The Cronbach alpha (α) of 0.73 was found in the present study, confirming its reliability for this study.

Customer-orientation behaviour is operationalized by using two dimensions that is "relations" and "ability to help". Relations refer to the ability of a agent to develop long-term relationships with customers on the basis of trust, co-operation and conflict resolution, while ability to help refers to the ability of salespeople to help their customers satisfy their needs (Saxe and Weitz, 1982). For the purpose of this study, a proposed shortened version of Saxe and Weitz (1982) customer-orientation-selling-orientation (SOCO) scale as modified by Thomas et al. (2001) consisting of 10 items, is used. The reliability of the measurement is between 0.70 and 0.91, and found to be a useful scale for sales management researchers (Thomas et al., 2001). The Cronbach alpha (α) of 0.65 was found in the present study, confirming its reliability for this study. The means, standard deviation and reliabilities of these scales are reported in Table 2 below. For performance variable, the average annual income of the respondents is RM 44 075.01. Related to sales target achievement, the average sales target achievement level is quite high (67.69%). For subjective performance rating, at five-point Likert scales, with mean scores of 3.81, respondents generally rate themselves at the higher performance level relative to other agents in their group.

Table 2: Means, Standard Deviations and Reliabilities of Measures

Variable	M	SD	Reliability
Customer-orientation behaviour	4.41	0.39	0.65
Annual income	RM44075.01	13790.48	-
Sales target achievement	67.69	20.78	-
Subjective performance ratings	3.81	0.58	0.73

Note: N=445

RESULTS

The stated hypotheses regarding the impact of customer-orientation behaviour on salesperson performance were tested using multiple regression following the guidelines established by Hair et al. (1998). Prior performing the actual hypotheses tests, correlations between the constructs were derived. Table 3 below shows the correlation structure of the data used in this study. As observed in Table 3, correlations amongst the measures of performance, namely annual income, sales target achievement and subjective performance ratings outcome show that only annual income and sales target achievement is significantly correlated. However, the association is very weak (r= .12). Subjective performance rating was found to be not significantly related to either annual income or sales target achievement. In general, this indicates that the three dimensions need to be addressed separately and that one performance does not necessarily lead to the other. For example, achievement of sales target does not translate to subjective performance ratings or vice-versa. With regards to customer-orientation behaviour and performance dimension relationship, the correlation is generally positive but weak. It gives indications that customer-orientation behaviour is not the major (or only) variable influencing sales performance.

Table 3: Construct Correlation Matrix

	Customer-orientation behaviour	Annual income	Sales target achievement	Subjective performance ratings
Customer-orientation behaviour	1.0			
Annual income	0.12**	1.0		
Sales target achievement	0.03	0.12*	1.0	
Subjective performance ratings	0.14**	0.04	0.02	1.0

Note: *p<0.05; **p<0.01

The individual hypotheses were then tested using a multiple regression prediction model (Hair et al., 1998) with performance dimensions as the dependent variable. The results obtained, as shown in Table 4-6, only two of the

three hypotheses were found to be significant in the prediction model. The results provide support for hypotheses H1 and H3, that is, the relationship between customer-orientation behaviour and annual income ($\beta=0.15$; $p<0.01$) as well as between customer-orientation behaviour and subjective performance rating ($\beta=0.14$; $p<0.01$). H2 was rejected due to the insignificant relationship that exists between customer-orientation behaviour and sales target achievement ($\beta=0.00$; $p>0.00$).

Table 4: The Influence Of Customer-Orientation Behaviour On Annual Income

Independent Variable	β	SE β	ß
Customer-orientation behaviour	4459.29	1443.51	0.15**

Note: R^2= .02; F= 9.54; Sig. F= .00; **$p<0.01$
B= Unstandardized coefficient beta; SEB= Standard error of regression coefficient

Table 5: The Influence Of Customer-Orientation Behaviour On Sales Target Achievement

Independent Variable	β	SE β	β
Customer-orientation behaviour	-1.18	2.10	-0.00

Note: R^2= .00; F= .00; Sig. F= .96
B= Unstandardized coefficient beta; SEB= Standard error of regression coefficient

Table 6: The Influence Of Customer-Orientation Behaviour On Subjective Performance Rating

Independent Variable	β	SE β	ß
Customer-orientation behaviour	0.19	0.06	0.14**

Note: R^2= .02; F=9.34; Sig. F= .00; **$p<0.01$
B= Unstandardized coefficient beta; SEB= Standard error of regression coefficient

DISCUSSION

This study found the level of customer-orientation behaviour among insurance agents in Malaysia is encouraging. Consistent with definition of customer-orientation behaviour, it can be interpreted as, in a way of doing business, the insurance agents tend to practice high marketing concept by trying to help their customers to make purchase decisions that will satisfy their needs and satisfactions. They engage in behaviours aimed at increasing long-term customer satisfactions and avoid actions which might result in customer dissatisfactions. In addition, they avoid actions which sacrifice customers interest to increase the probability of making immediate sales.

One plausible reason to explain this finding is due to the increasingly keen business competition, particularly the growing numbers of insurance companies and insurance agents. As at June 2003, there are 83,720 registered agents working with 16 life insurance companies in Malaysia (UPDATE, 2003). The fact that customers are more knowledgeable and have high expectations on the services provided by the agents also contribute to the increasing concern put by the agents on the needs and satisfaction of their clients. Given these challenges, the insurance companies have urged their agents to improve their standards of services to meet the increasingly sophisticated needs of the insuring publics and to deal with competitive pressure in the industry. Consequently, this leads the agents to raise their standards of professionalism in the marketing of life insurance products by focusing more on adopting customer-orientation behaviour, which implies solving customers' problems, providing opportunities and adding value to the customer's business over an extended period of time. This result is similar to Howe et al. (1994) and Boles et al. (2000) who found high level of customer-orientation behaviour among insurance sales agents in their studies in the United States. In business to business sales force, Siguaw et al. (1994) also discovered that their respondents reporting high level of customer-orientation behaviour.

Despite the small r^2 obtained for the relationship between customer-orientation behaviour and performance variable, the present study provide some important insights into the influence of customer-orientation behaviour on sales agents annual income as well as subjective performance rating. The sampled sales agent reported customer-orientation behaviour had a significant positive relationship on their annual income and the way they perceive their performance relative to other sales agents in their group. The positive relationship between customer-orientation

behaviour and annual income is perhaps due to the result of buyer/seller relationship. Agents who have higher customer-orientation behaviour are known as better at developing and maintaining buyer-seller relationships. They are willing to invest time and effort required to understand the customers' needs and problems; and alter one's actions in a manner that responds to those needs in an honest and non-manipulative fashion. This will influence the amount of satisfaction customers experience as well as the quality and duration of relationships with sales agent. The satisfied customers may reward the sales agent by buying new policies or continuing with the existing policies. In the case of insurance agents, the more policies clients buy, the more commission the agents will get and consequently, the more their annual income will be. Furthermore, given the great competition and the apparent buyers market in the insurance industry in Malaysia, greater customer-orientation behaviour will induce greater business either in terms of greater number of customers, greater value of business per customer or both.

Although this study has examined different samples, the positive relationship of customer-orientation behaviour to annual income in this study is consistent with previous findings of Dwyer et al. (2000) who found that top performing salesperson (high annual income) met their clients' process needs by taking a more personal, customer-oriented focus in life insurance industry in the US. It is also consistent with Keillor et al. (2000) and Boles et al. (2001) who found the same evidence among professional sales organization and retail salespeople respectively. Martin and Bush (2003) also discovered that salesperson customer-orientation relates to higher performance in both business and retail settings. Other research indicates that maintaining a customer-orientation results long-run sales performance (Swenson and Herche, 1994). This study moves one step further by bringing evidence that the positive effect of customer-orientation behaviour on annual income also holds true among insurance agents in Malaysia. Our establishment of a positive and significant association between customer-orientation and performance among insurance sales agents lends credence to the findings of the majority of empirical efforts which have explored the relationship between customer-orientation and performance in various national context (e.g. Keillor et al., 2000; Boles et al., 2001; Brown et al., 2002; Roman et al., 2002).

Positive relationship between customer-orientation behaviour and subjective performance rating means that the higher the customer-orientation behaviour of the sales agents, the higher they tend to perceive themselves better than their colleagues in terms of generating commissions earned, exceeding sales target, generating sales of new clients, maintaining a good relationship with existing clients and producing a high market share for the company. Again, this is may be, at least in part, based on the development of trust between the exchange partners (agent and client) (Boles et al., 2000; Dwyer et al., 1987). The role of customer-orientation behaviour is distinct from the traditional sales process activities, such as handling objections and closing. Instead, customer-orientation behaviour focuses on diagnosing the needs of the customers and with best ability to fulfill their needs and satisfactions.

When customers feel that they can fulfill their needs and satisfactions from doing transaction with the salesperson, this will allow for greater trust and communication, thereby leading to lower customer turnover and more referrals and recommendations (Boles et al., 2000). These outcomes therefore result in superior salesperson performance. The findings reported in this study show the coefficients of determination (R^2 value) for the relationship between customer-orientation behaviour and annual income as well as subjective performance rating are relatively low. The r square statistics obtained here are somewhat shows low ability of customer-orientation behaviour to predict sales performance. Consequently, it would not be surprising that customer-orientation behaviour would not be translated into high levels of sales agent's performance. Statistically, this is probably due to the lack of variation in customer-orientation among respondents. Despite high level of customer-orientation perform by the agents, the variation of customer-orientation behaviour is very low. This indicates that customer-orientation behaviour is commonly been practice by agents and thus have become a normal trend in the industry. Therefore, it is no longer gives a large significant influence on agent's performance.

Although larger r^2 value would be desirable, the low amount of variation explained should be expected (Boles et al., 2000; Keillor et al., 2000). Other study conducted in insurance industry also discovered the small contribution of sales agent relationship selling behaviour on performance. For example, Boles et al. (2000) in their study among life insurance agents in the United States found that only 7 percent of the variation in sales performance (measured by number of policies sold) is contributed by three dimensions of relationship selling behaviour (interaction intensity, mutual disclosure and cooperative intentions). Recent study by Roman et al. (2002) also discovered that despite the significant relationship, customer-orientation behaviour only contribute 2 and 5 percent of the variation in sales force performance among employees in SME companies in Spain. On the other hand, study conducted by Howe et al. (1994) found no relationship exist between customer-orientation and sales performance (measured by policy sold) of insurance agents. Theoretically, only a small number of the many theoretical predictors of sales performance variables have been included in this study. Accordingly, a proportionately small amount of variation in the dependent variables explained are not surprising (Singhapakdi and Vitell, 1991).

While the above discussion link the positive results of customer-orientation behaviour on annual income and subjective performance rating, our findings demonstrated customer-orientation behaviour has no relationship to the achievement of sales target. This indicates that adoption of customer-orientation behaviour is not related to the achievement of sales target among insurance agents. These results would appear to provide somewhat mixed support for the importance of customer-orientation behaviour. One plausible reason is that, in the case of sales target, it is set without taking into consideration of customer-orientation behaviour. Target sets as what they like to achieve not what is likely be achieved. The non-significant results between sales target achievement and customer-orientation behaviour in line with Dwyer et al. (2000) contention that in life insurance industry in particular, there is considerable variation in the performance of life insurance salespeople. In this regard, it is important to note that performance is a multi-dimensional construct and may be characterized in a number of ways, including effectiveness, adaptability and efficiency (Jaworski and Kohli, 1993). Furthermore, it is common to have mixed results on the influence on salesperson behaviour on sales performance (Boles et al., 2000). For example, Boles et al. (2000) in their study found that from three dimensions of relationship selling behaviours; that is interaction intensity, mutual disclosure and cooperative intentions, only two dimensions (interaction intensity and mutual disclosure) are significantly related to sales performance.

In this case, as performance is multidimensional and that different aspects of performance are more important in some sales jobs and situations (Plank and Reid, 1994), it might happen that in the case of customer-orientation behaviour, it has more significant influence on the annual income and subjective performance rating rather than to achieve the sales target. Furthermore, as Pitt et al. (1996) argued, low R square values obtained in customer-orientation and performance linkage might be because sales performance is likely to be affected not just by customer-orientation, but by a number of other variables, including external factors. Therefore, the failure to support one of the three hypotheses could call into question the importance of customer-orientation behaviour on target achievement.

MANAGERIAL IMPLICATIONS AND RECOMMENDATIONS

The results provide a few key implications on how sales managers in particular and Life Insurance Association (LIAM) in general can manage insurance agents in an effective way. Although only a small contribution of customer-orientation behaviour on annual income as well as subjective performance rating exist, review of the results show that agents with customer-orientation behaviour generally have higher annual income and rate themselves better than their colleagues. A practical implication of the results of this study is that performance would improve slightly if a salesperson could learn to become more customer-oriented. However, due to the small percent of variation in performance is explained by customer-orientation behaviour, managers are advised not to regard customer-orientation behaviour as a panacea to sales agent performance. There may be other factors that contribute more to performance of the agent.

Furthermore, the result fails to support contentions that customer-orientation behaviour is significantly related to sales target achievement, which is often an important evaluative criteria in insurance industry. Perhaps the importance of customer-orientation behaviour as a performance construct lies in the type of performance desired from a sales manager. If sales managers are seeking agent that make sales quickly and achieved the targeted quota, then customer-orientation behaviour may not be a critical dimension. On the part of LIAM, although findings in the present study show that agents generally have high level of customer-orientation behaviour, it should continue to focus on the efforts to educate the agents on how to serve the customers' better, in line with increasingly customers' expectations and knowledge on insurance. This is due to the fact of globalization and the presence of more foreign players and independent financial advisers in the industry, where agents will face competition to survive in business. Only those who have the ability to reach and tackle the customers' will survive. This justify that continuous training and education on how to serve the customers' especially to newly agents is undeniably crucial agenda for LIAM in order to enhance the professionalism of insurance agents.

LIMITATIONS OF THE STUDY

The sample of salespersons was taken from one industry. It has been noted that job attitudes and selling behaviours may not be congruous across different selling environments (Siguaw and Honeycutt, 1995). Consequently, the results of this study cannot be generalized to all industries. Furthermore, a sufficiently large sample size and response rate was obtained. However, the respondent salespeople, although drawn from a variety of companies, were all engaged in selling within a single industry.

The measures of performance may not have been the ideal ones for the present study. Perhaps other performance measures could have been used as criterion variables. For example, the study could have compared the ratings provided by customers to determine the degree to which customer-orientation behaviour contributed to the occurrence of a sale. Perhaps other measures of customer-orientation behaviour could be used. However, this suggestion is provided with some level of misgiving, because other measures should be operational in order to be useful in practice.

From a methodological standpoint, data in this study were obtained from full-time sales insurance agents in the selected companies. It would be useful to obtain a broader sample of agents and perhaps even part-time agents in future studies. This would minimize any potential bias in the data resulting from the level of the informants. Furthermore, this study did not control the characteristics of the sales job. O'Hara et al. (1991) suggests that customer-oriented selling performance may vary based on other characteristics of the sales job. Furthermore, since all measures are self-reported, common method variance is also a potential problem (Sohi, 1996). An attempt was made to minimize problem by using well-established scales for most constructs, and pre-testing the questionnaire to ensure that there was no perceived overlap between the different variables.

Although significantly related, the association between customer-orientation behavior on performance dimensions is not very strong. Perhaps the measures of customer-orientation and performance need further development and validation. It is possible that additional dimensions of customer-orientation exist that might improve its predictive ability.

CONCLUSION

Despite the low R^2 obtained, findings of the study suggest that the customer-orientation behaviour of the insurance agent have positive influence on sales performance, measured by annual income and subjective performance rating. The finding gives academicians and managers a much stronger basis than intuition and anecdotes for recommending the wisdom of adopting and implementing a customer-orientation approach. As such, it appears that sales agents should strive to improve their customer-orientation behaviour in their efforts to attain higher sales performance. It should be noted that, although a relationship between customer-orientation behaviour and sales target achieved was not found in this study, this finding should be tempered by the considerations discussed earlier. These findings provide additional evidence to the growing body of knowledge concerning the importance of adopting customer-oriented approach. It is not our purpose to advocate that all sales person necessarily better served in a sales performance sense by embracing a customer-orientation behaviour. The external environment in which the agents operates will certainly affect the decision concerning the most appropriate–orientation from a sales dollar standpoint. However, should a sales person elect a customer-orientation behaviour as its orientation of choice, this study supports the position that salesperson will achieve slightly greater levels of annual income and more satisfied customers.

In other instances, the relationship between customer-orientation behaviour and sales performance must still be regarded with some degree of skepticism. Prior to the reader's disregarding the findings as counter intuitive, it should be noted that the results reported are consistent with prior results. Consequently, the results lead to the conclusion that customer-orientation behaviour, as measured in this study is positively related to sales performance.

REFERENCES

Appiah-Adu, K and Singh, S. 1998. Customer Orientation and Performance: A Study of SMEs. *Management Decision,* Vol. 36, No. 6, pp. 385-394.

Armstrong, J. and Overton, T.S. 1977. Estimating Nonresponse Bias in Mail Surveys. *Journal of Marketing Research.* Vol. 14, pp. 396-402

Behrman, D. and Perrault, W.D. 1982. Measuring the Performance of Industrial Salespeople. *Journal of Business Research, Vol. 10, pp. 335-370.*

Boles, J.S., Babin, B.J., Brashear, T.G. and Brooks, C. 2001. An Examination of the Relationships between Retail Work Environments, Salesperson Selling Orientation-Customer Orientation and Job Performance. *Journal of Marketing Theory and Practice,* Vol. 9, Issue 3, pp. 1-13.

Boorom, M.L., Goolsby, J.R. and Ramsey, R.P. 1998. Relational Communication Traits and their Effect on Adaptiveness and Sales performance. *Academy of Marketing Science,* Vol. 26, Issue 1, pp. 16-30.

Brady, M.K. and Cronin, J.J. 2001. Customer Orientation: Effects on Customer Service Perceptions and Outcome Behaviours. *Journal of Service Research,* Vol. 3, Issue 3, pp. 241-251.

Bragg, A. 1986. Turning Sales People Into Partners. *Sales & Marketing Management*, Vol. 137, August, pp. 82-84.

Brown, G. 1988. *An Analysis of the Effect of Customer Orientation -Salesperson/buyer relationship and Salesperson Resources on Salesperson Performance: A Situational Approach.* PhD Dissertation, University of Alabama. USA.

Brown, T.J., Mowen, J.C., Donavan, D.T. and Licata, J.W. 2002. The Customer Orientation of Service Workers: Personality Trait Effects on Self-and Supervisor Performance Ratings. *Journal of Marketing Research,* Vol. 39, Issue 1, pp.110-119.

Chee, L.K. and Peng, N.K. 1996. Customer Orientation and Buyer Satisfaction: The Malaysian Housing Market. *Asia Pacific Journal of Management,* Vol. 13, No. 1, pp. 101-116.

Churchill, G.A., Ford, N.M., Hartley, S.W. and Walker, O.C. 1985. The Determinants of Sales force Performance: A Meta Analysis. *Journal of Marketing Research*, Vol. 22, pp. 103-118.

Cravens, D.W., Ingram, T.N., LaForge, R.W. and Young, C.E. 1993. Behaviour Based and Outcome Based Sales Force Control Systems. *Journal of Marketing,* October, pp. 47-59.

Deshpande, R., Farley, J.U. and Webster, F.E. 1993. Corporate Culture, Customer-Orientation and Innovativeness in Japanese Firms: A Quadrad Analysis. *Journal of Marketing,* Vol. 57, pp. 23-27.

Diefendorff, J.M., Brown, D.J, Kamin, A.M. and Lord, R.G. 2002. Examining the Roles of Job Involvement and Work Centrality in Predicting Organizational Citizenship Behaviours and Job Performance. *Journal of Organizational Behaviour,* Vol. 23, pp. 93-108.

Donovan, D., Todd, B. and Mowen, J.C. 2004. Internal benefits of Service-Worker Customer-Orientation: Job Satisfaction, Commitment and Organizational Citizenship Behaviour. *Journal of Marketing*, Vol. 68, Issue 1.

Dubinsky, A.J. and Hartley, S.W. 1986. A Path Analytic Study of a Model of Salesperson Performance. *Journal of the Academy of Marketing Science,* Vol. 14, pp.36-46.

Dunlap, B.J., Dotson, M.J. and Chambers, T.M. 1988. Perceptions of Real-estate Brokers and Buyers: A Sales-Orientation, Customer-Orientation Approach. *Journal of Business Research,* Vol. 17(2), pp. 175-187.

Dwyer, R.F., Schurr, P.H. and Sejo. O. 1987. Developing Buyer-Seller Relationships. *Journal of Marketing*, Vol. 51 (April). pp. 11-27.

Dwyer, S., Richard, O and Shepherd, C.D. 1998. An Exploratory Study of Gender and Age Matching in the Salesperson-Perspective Customer Dyad: Testing Similarity-Performance Predictions, *The Journal of Personal Selling & Sales Management,* Fall, Vol. 18, Issue 4, pp. 55-69.

Dwyer, S. Hill. J. and Martin, W. 2000. An Empirical Investigation of Critical Success Factors in the Personal Selling Process for Homogeneous Goods. *The Journal of Personal Selling & Sales Management*. Vol. 20, Issue 3, Pp. 151-159.

Goff, B., Boles, J.S., Bellenger, D.N. and Storjack, C. 1997. The Influence of Salesperson Selling Behaviours on Customer Satisfaction with Products. *Journal of Retailing*, Vol. 73, (Summer), pp. 171-184.

Hair, J., Anderson, R. Tatham, R. and Black, W. 1998. *Multivariate Data Analysis.* Macmillian: New York.

Honeycutt, E.D., Siguaw, J.A. and Hunt, T.G. 1995. Business Ethics and Job-Related Constructs: A Cross-Cultural Comparison of Automotive Salespeople. *Journal of Business Ethics*, Vol. 14, pp. 235-248.

Howe, V, Hoffman, K.D. and Hardigree, D.W. 1994. The Relationship between Ethical and Customer-Oriented Service Provider Behaviours. *Journal of Business Ethics*, Vol. 13, pp. 497-506.

Jaworski, B and Kohli, A. 1993. Marketing Orientation: Antecedents and Consequences. *Journal of Marketing*. Vol. 57, (July), pp. 53-70.

Jones, E., Busch, P and Dacin, P. 2003. Firm Market-Orientation and Salesperson Customer-Orientation: Interpersonal and Intra Personal Influences on Customer Service and retention In Business To Business Buyer-Seller Relationships. *Journal of Business Research*, Vol. 56, Issue 4, pp. 323-340.

Keillor, B.D., Parker, R.S. and Pettijohn, C.E. 1999. Sales Force Performance Satisfaction and Aspects of Relational Selling: Implications for Sales Managers. *Journal of Marketing Theory and Practice,* (Winter), pp. 101-115.

Keillor, B.D., Parker, R.S. and Pettijohn, C.E. 2000. Relationship-Oriented Characteristics and Individual Salesperson Performance. *The Journal of Business & Industrial Marketing,* Vol. 15, Issue 1.

Kerlinger, F.N. 1973. *Foundations of Behavioural Research. (2ⁿᵈ edition).* Holt, Rinehart and Winston: New York.

Kim, W.G. and Cha, Y. 2002. Antecedents and Consequences of Relationship Quality in Hotel Industry. *International Journal of Hospitality Management*, Vol. 21, Issue 4, pp. 321-338.

Kohli, A. and Jaworski, B. 1990. Market Orientation: The Construct, Research Propositions and Managerial Implications. *Journal of Marketing*, Vol. 54, (April), pp.1-8.

Kotler, P. 2000. *Marketing Management: Analysis, Planning, Implementation and Control* (10th ed) Upper Saddle River, NJ: Prentice Hall.

Leong, S.M., Randall, D.M. and Cote, J.A. 1994.'Exploring the Organizational Commitment-Performance Linkage in Marketing: A Study of Life Insurance Salespeople. *Journal of Business Research,* Vol. 29, pp. 57-63.

Low, G.S., Cravens, D.W., Grant, K. and Moncrief, W.C. 2001. Antecedents and Consequences of Salesperson Burnout. *European Journal of Marketing*, Vol. 35, No. 5/6, pp. 587-611.

MacKay, H.B. 1988. Humanize Your Selling Strategies. *Harvard Business Review*, Vol. 66, (March-April), pp. 36-38.

MacKenzie, S.B., Podsakoff, P.M. and Ahearne, M. 1998. Some Possible Antecedents and Consequences of In-Role and Extra-Role Salesperson Performance. *Journal of Marketing,* Vol. 62, July, pp. 87-98.

Narver, J.C. and Slater, S.F. 1990. The Effects of a Market Orientation on Business Profitability. *Journal of Marketing,* Vol. 54, (October), pp. 20-35.

Nik Mat. N.K. 1995. *Determinants of Sales Performance in Insurance Industry: A Cross-Cultural Comparison Between the UK and Malaysia,* PhD Thesis, The University of Aston in Birmingham.

O'Hara, B., Boles, J.S. and Johnston, M.W. 1991. The Influence of Personal Variables on Salesperson Selling Orientation. *Journal of Personal Selling & Sales Management,* Vol. 11, (Winter), pp. 61-67.

Parsons, A.L. 2002. What Determines Buyer-Seller Relationship Quality? An Investigation From the Buyer's Perspective. *Journal of Supply Chain Management*. Vol. 38, Issue 2, pp. 4-12.

Pitt, L., Caruana, A. and Berthon, P.R. 1996. Market Orientation and Business Performance: Some European Evidence. *International Marketing Review,* Vol. 13, Issue 1, pp. 5-19.

Roman, S., Ruiz, S. and Munuera, J.L. 2002. The Effects of Sales Training on Sales Force Activity. *European Journal of Marketing,* Vol. 36, No. 11/12, pp. 1344-1366.

Saxe, R. and Weitz, B.A. 1982. The SOCO Scale: A Measure of the Customer Orientation of Salespeople. *Journal of Marketing Research,* Vol. 19, (August), pp. 343-351.

Schultz, R.J and Good, D.J. 2000. Impact of the Consideration of Future Sales Consequences and Customer-Oriented Selling on Long-Term Buyer-Seller Relationships. *Journal of Business & Industrial Marketing*. Vol. 15, Issue 4.

Swenson, M.J. and Herche, J. 1994. Social Values and Salesperson Performance: An Empirical Examination. *Journal of the Academy of Marketing Science,* Vol. 22, (Summer), pp. 283-289.

Thomas, R.W., Soutar, G.N. and Ryan, M.M. 2001. The Selling Orientation-Customer Orientation (SOCO) Scale: A Proposed Short Form. *The Journal of Personal Selling & Sales Management,* Vol. 21, Issue 1, pp. 63-69.

Taylor, T. 1986. Anatomy of a Star salesperson. *Sales & Marketing Management*, Vol. 136. pp. 49-51.

Tyagi, P.K. 1985. Relative Importance of Key Job Dimensions and Leadership Behaviours in Motivating Salesperson Work Performance. *Journal of Marketing*, Vol. 49, Summer, pp. 76-86**.**

Update. 2003. Vol. 15, No. 1,No. *Life Insurance Association of Malaysia*. Kuala Lumpur.

William, M.R. 1998. The Influence of Salespersons' Customer Orientation On Buyer-Seller Relationship Development'. *Journal of Business & Industrial Marketing,* Vol. 13, Issue 3.

Williams, M.R. and Attaway, J.S. 1996. Exploring Salespersons' Customer Orientation as a Mediator of Organizational Culture's Influence on Buyer-Seller Relationships. *Journal of Personal Selling and Sales Management,* Vol. 16, (Fall), pp. 33-52.

Internationalisation Of Cooperative Societies In Kedah, West Malaysia

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ABSTRACT
The purpose of the study is to determine whether the Kedah's cooperatives have the potential to involve in international business. Via this research, it is very helpful in understanding the internationalization of cooperative and providing useful insights to cooperative's management. The government and financial institutions have set up new policies encouraging cooperatives to engage in international business can use this study. This study is based on the descriptive procedure. In the quantitative approach, 150 questionnaires were administered and the returnable was 116. Findings from the study disclosed that there were 5 major barriers faced by Kedah cooperatives distracting them from engaging in international business. This study also highlighted important incentives, strategies and factors that can influence cooperatives to engage in international business. Finally, the study provided some recommendations to authorised parties and cooperative's management in order to encourage and assist Kedah's cooperatives to overcome the barriers in international business.

INTRODUCTION

The Cooperative Movement was introduced in the then Malayan Union in 1922 as a measure against the proliferation of debts amongst farmers and government workers. It can be classified into three main eras mainly the pre-war era, the post-war era and the new era of cooperative movement. Before the war, cooperative movement was an establishment that saved and lent out money with low interest.

A second phase began after World War II, when government sourced in money into structuring independent cooperative in this country. "Cooperative Societies Ordinance 1948" was instituted to synchronize all cooperative activities under the Cooperative Law, 1948. A new period of cooperative movement began in the 1980s and was launched by the Prime Minister on the 28th February 1982.

The innovators of cooperative movements from Rochdale, England who were known as "The Rochdale Pioneers" had established a precise definition of the term cooperative in 1844. The term cooperative means: "An organization which coordinates business endeavors which are profitable in addition to the increase of life's quality and security of its members through the accumulation of a sufficient amount of modals' shares". In Malaysia, the definition of cooperative is based on the Cooperative Act 1948 (revised in 1983) which explained the term cooperative as "A voluntary organization which comprised of at least 100 members and which acts to increase the quality of lives of its associates according to the agreed and stipulated principles".

Cooperative in Malaysia

Table 1: Statistic of cooperative growth in Malaysia (1990 – 2002)

Year	No. of Cooperative	No. of Member (million)	Capital Share (RM billion)	Total Assets (RM billion)
1990	3,028	3.33	1.64	6.15
1991	3,083	3.44	1.75	6.55
1992	3,228	3.66	1.92	7.60
1993	3,388	3.91	2.18	8.33
1994	3,473	4.06	2.44	10.14
1995	3,554	4.25	2.74	10.39
1996	3,753	4.21	2.83	12.17
1997	3,847	4.13	3.17	12.96
1998	3,942	4.55	3.60	14.10
1999	4,050	4.33	3.84	14.10
2000	4,154	4.50	4.21	15.82
2001	4,246	4.76	4.3	18.90
2002	4,330	5.027	4.40	19.00

Source: Jabatan Pembangunan Koperasi, 2002

Table 2: Number of Cooperative by State

State	Total
Johor	392
Melaka	150
Negeri Sembilan	256
Pahang	345
Selangor	320
Wilayah Persekutuan	290
Perak	467
Pulau Pinang	238
Kedah	329
Kelantan	288
Terengganu	229
Perlis	74
Sabah	479
Sarawak	472
Ibu Pejabat	1
Total	4330

Source: Jabatan Pembangunan Koperasi, 2002

COOPERATIVE ROLES IN THE COUNTRY'S DEVELOPMENT

Advancement is a process which brings about changes and a better level of progress in a multi spectrum of aspects apart from economy, either socially, politically and in many other different facets of community's factors. The development of cooperative is one of the most important components which contributed to a rapid growth of a country's economy. Therefore, the Malaysian government has already endorsed cooperative as the third sector which contributed to the country's development after the public and private sectors.

In the fourth Malaysian Yearly Plan, during the period of 1981-1984, the cooperative movement had made a great stride in its effort to accrue fund, which was used to support economic activities, and contributed greatly to the increase of its members' socioeconomic quality and the country's unity.

In Malaysia, progress in the cooperative movement is a proud example in which its members are quite large compared to cooperatives from other countries. According to the Sri Lankan Cooperative Merger Loan Officer, Mr. D.A.Hamandoda, cooperative activities in Sri Lanka had only managed to help its members who are in the small businesses which appear to be "cottage industry" in rural and isolated areas (PELANCAR, June 1991: 18). The slow progress made is a direct consequence of the lack of understanding in members' roles and functions of cooperative in development contribution, even when cooperative is no longer a novel concept in Sri Lanka.

Datuk Seri Abdullah Ahmad Badawi has once made the statement that cooperative is no longer a place for its members to buy goods at a cheaper price, to acquire small loans or to purchase merchandise in installments. More than that, cooperative plays an important role in a country's progress in which it is the generator that uses every resource available largely towards the growth of the nation. With an accumulated asset of RM 19 billion contributed by more than 5.02 million members throughout the 4,372 cooperatives available nationwide, this sector cannot be considered as just a loan service provider anymore. There are a lot more areas in which cooperative could be the prime mover and contributes even as an economic catalyst in government and private sectors (UTUSAN MALAYSIA, July 2003).

The roles of cooperative in a country's advancement will be more significant if the cooperative members are sensitive to the current and future trends, have the willingness to cultivate the support for activities carried out by cooperative and ready to contribute in cooperative shares.

Cooperative has also made a major contribution in the structuring effort of reinstating ownership through various participations in important sectors such as monetary, property development, housing, land, businesses and transportation. This active involvement ensures that the burden of development project does not always fall on the government especially towards the improvement of rural areas. As an example, the setting up of rural cooperative is for the purpose of ensuring that they would get equal opportunity in development and to reap the benefit of a country's progress without being discriminated by capitalists. People in the rural areas have the opportunities to learn the trade and different types of economic know-how and to instill a sense of partnership.

The concept of equal partnership is in concordance with the Country's Precepts. The philosophy behind it is: "To create equality in a community where the Country's Prosperity is shared fairly and evenly", whereas the philosophy of cooperative covers "the urgency of eliminating poverty and inequity and the fair distribution of wealth" (Cik Putih, 1981: 9).

In accordance with its objective of establishment, cooperative functions to a great extent in the enhancement of quality in the socioeconomic aspect of a community. At any rate, the creation of cooperative produces the inadvertent effect of poverty eradication. This therefore should be used to target those hardcore underprivileged communities which mostly composed of farmers, who live in rural areas and backward states and the poor communities in inner-city areas.

Cooperatives which consist of lower income group will focus on activities that entail the production of crafts and the trade of farms' produce, small scale industry, trades and any other consumer services. Apart from that, the setting up of cooperative among workers is essential as it contributes greatly to workers' improvement.

The activity of cooperative movements is one of the factors which could lower destitution particularly for those in the countryside. Focus should be given to people in the lower income bracket for instance fishermen, small-scale farmers, plantation workers, hawkers or villagers. These people will get the same benefits from a country's development, without bias perspectives based on ethnics, beliefs, political inclination, living areas or any other differences particularly anything which has got to do with output resources such as land, equipments and shares equity (Malaysia, 1991a: 193).

The reduction of poverty can be achieved through redoubling of productivity which directly increases earnings. This can be directed to target groups such as rubber tapers, plantation workers, paddy farmers and fishermen. Through cooperative activities, the poor especially the 'bumiputeras' will be able to diversify their source of income. This will definitely wean them from a more traditional based activity which yields low returns. Efforts of poverty eradication which is based on the concept of self sufficiency in cooperative movement has to be given a backing since it corresponds with the Malaysian government's long term plan (Rangka Rancangan Jangka Panjang 2 [RRJP2]) which desires the freedom of people from any degree of destitution especially through programme that works towards self-reliance and community based activities.

Special credit scheme which exists in cooperative should be redrafted as to provide ample opportunity for the poor to gain benefit directly from the scheme. In this context, cooperatives should be able to take constructive measures by providing the fund for micro credit scheme to small and medium scale businesses. Thus, even cooperative members who happen to have a small amount of modals would be able to contribute to a country's economy. Notwithstanding, cooperative marketing infrastructure should be strengthened chiefly in the arrangement of transportation and the storage of farm's produce or the saving of profit from business or small industry.

The mobility of cooperative is seen as the antidote to unemployment by affording jobs' opportunity. Owing to cooperative availability in the rural areas, jobs are growing and reducing the migration of youths to towns or big cities.

COOPERATIVE INVOLVEMENT IN INTERNATIONAL BUSINESS

Equal opportunity is provided through globalization for new opportunities and threats. To brave the new challenges in international business scene, cooperative has to prime itself through diversification and an increase in the numbers of its members. According to Chief Director of Malaysia Cooperative Development Department, Datuk Syed Idid Syed Abdullah:
"It can never be denied that there will be rivalry arising from institution which is active in almost in the same enterprise or almost similar to it, and this competition is not necessarily exclusively from within this country. (Utusan Malaysia, 18 Disember 1996).

Expansion of cooperatives in Malaysia should cover the international regions so that relationship with cooperatives from within this and other countries should stay strong. As an illustration, the cooperatives in Sabah have contracted a business venture with cooperatives from the Philippines (Mindanao) while the cooperatives in Sarawak work in tandem with some of the cooperatives in Indonesia (Kalimantan). Aside from that, one of the ways to reinforce the cooperative in this country so that it will stay current is by endowing it with a franchise or vendor system given to any cooperative with the reserve to accomplish it.

The President of International Cooperative Association (ICA), Ivano Barberini said that, the International Labour Organisation (ILO) had approved of an important document, ILO Recommendation 193, in order to give a better position to cooperative. The main features of this document are to identify the importance of cooperative in economy and social development, to reaffirm the position of cooperative identity, to give fair treatment to cooperative, to identify a government's role in laying out the foundation, laws and facilities in terms of monetary or services, to encourage active participation from employers, workers and cooperative organizations and to promote working relationship internationally. (PELANCAR, April 2003)

ILO Recommendation 193 concurs to the fact that globalization engendered challenges, problems and competitions apart from varied and new opportunities for cooperative and how strong affiliation either nationally or internationally are vital to accommodate the sharing of cooperative's revenue equitably. (PELANCAR, December 2003)

LITERATURE REVIEW

Generally, cooperative in Malaysia only focus on domestic business. However, to enter into international business, several elements should be stressed.

According to Beamish (1990) " internationalization" is the process by which firms increase their awareness of the influence activities on their future activities, establish, and conduct transactions with firm from other countries. Firms become international for a variety of reasons such as a desire for continued growth, domestic market saturation and the potential to exploit a new technological advantage. Beamish also found that a strong correlation exists between improved performance and degree of internationalization.

Ellis and Williams (1995) stated that the internationalization process describes the sequences through which a firm evolves from domestic organization, serving a relatively homogeneous home market, to active exporter, and subsequently an international corporation serving a large number of diverse multinational and cultural markets.

Internationalization is a process of increasing involvement in international operations, which requires adaptation the firm's strategy, resources, structure and organization to international environments (Welch & Luostarine, 1988; Calof and Beamish, 1995).

In seeking to penetrate foreign markets, firms may choose from various entry modes. Typical modes of entry include exporting, licensing, joint ventures, acquisitions, and green-field investments. Each mode involves different resource deployment patterns (Agarwal & Ramaswamy, 1991), levels of control and risk (Kim & Hwang, 1992) and political and cultural awareness (Dalli, 1995)

Yaprak's (1985) research concluded that non-exporters perceived anxieties about export involvement were due to lack of information about exporting, limited foreign market contacts and personnel deficiencies.

Barret and Wilkinson (1985) added that the inability to meet competitive prices of overseas suppliers and high freight costs involved in selling to foreign markets stood as particularly important hindrances to engage in international business.

Bilkey (1978) further stated that high risk, insufficient financing sources, prohibitive or protective foreign government regulations, inadequate distribution channels, insufficient knowledge of marketing opportunities abroad, difficulties in understanding foreign markets and lack of foreign marketing connections to be the most often cited barriers to exporting.

Aharoni (1996) stated that, due to limited market knowledge and experiences, most companies during the early stages of internationalization would often look to outside foreign intermediaries to assist in market penetration of a particular country.

Sullivan and Bauerschmidt (1990) found that close proximity to foreign markets, diminishing growth opportunities in the home market, expectation of economies resulting from added value of trade, availability of unused production capacity, managerial beliefs about the value of exporting, improvement in the growth potential of the product market and chance to diversify into new markets were the major incentives for the firms to engage in international business.

Bilkey (1978); Bilkey and Tesar (1977) and Cavusgil (1984) found that among other motivators, which have been found to be correlated with initial export involvement are receipt of unsolicited foreign orders, aspirations for greater profit, sales growth, the desire to spread risks of research and development costs across a wider volume, the need to utilize excess manufacturing capacity and the desire to achieve stability through diversification.

Meredith (1984) argued that the owners of a firm would benefit if that firm spreads its sources of income over a set of activities that are diversified internationally. Meredith stated that the firm would face high risk if doing the business in one country only.

According to Stobaugh (1969) and Davidson (1982), several factors are considered important in assessing the potential attractiveness of a foreign market. These include market size and growth, competition, servicing costs and the host country's social, political and economic environment.

METHODOLOGY

This study is based on cooperatives in the Kedah. The data is gathered from 116 cooperatives. These cooperatives were selected based on registration in Kedah Department of Cooperative Development. Questionnaires consisting of 90 questions were distributed to 150 cooperatives. Of the 150 sent, 116 cooperatives responded (a response rate of 77%).

Survey Questionnaires

The structured survey questionnaires used in this study consisted of 5 sections and 90 questions. The 29 questions in sections A and B were used to obtain the information concerning the profile of respondents and the cooperative characteristics. The remaining 62 structured questions in the C, D and E sections were designed to measure the barriers, incentives, strategies and factors that cooperatives should be concerned before involving into international business. In sections C and D, the respondents were asked to rate each item on a five-point scale ranging from (1) strongly disagree to (5) strongly agree. While, section E had a scale ranging from (1) not very important to (5) very important. The questionnaire was tested prior to mailing to the respondent in Alor Setar area. The coefficient alpha scores of the 30 measures of international business barriers and incentives were 0.93 and 0.87 respectively. Both coefficients showed a high significant.

Background of the Sample Cooperatives

Cooperatives from 8 functions were presented in this study. The majority of these cooperative were from transportation, beverage, and engineering services and tobacco industries. Table 3 and 4 provide the information on the locations of the cooperative and the types of industries they represented.

Table 3: Cooperatives by the Districts

District	No. of Cooperatives	Percentage
Baling	18	14.00
Kota Setar	3	2.00
Kota Setar/ Padang Terap	20	16.00
Kota Setar/ Pendang	15	11.33
Kota Setar/ Yan	14	11.33
Kuala Muda	16	12.00
Kubang Pasu	8	6.67
Kulim/ Bandar Baharu	13	11.33
Langkawi	9	7.34
Sik	9	8.00
Total	116	100.00

Source: Jabatan Pembangunan Koperasi Negeri Kedah, 2002

Table 4: Cooperatives by Industries

Type of Industry	No. of Cooperatives	Percentage
Food	4	3.4
Beverage	11	9.5
Tobacco	9	7.8
Leather	2	1.7
Wood	4	3.4
Paper	3	2.6
Rubber	5	4.3
Plastic	2	1.7
Metal	4	3.4
Steel	5	4.3
Machinery	3	2.6
Electronic	2	1.7
Petroleum	3	2.6
Cement	1	0.9
Marble	1	0.9
Carbon	2	1.7
Pharmaceutical	3	2.6
Automobile	1	0.9
Chemical	5	4.3
Other Manufacturing	11	9.5
Engineering	10	8.6
Shipping	1	0.9
Telecommunication	2	1.7
Cargo	1	0.9
Insurance	1	0.9
Travel Agency	1	0.9
Transportation	19	16.4
Total	116	100.00

RESULTS

Respondents' Characteristics

As shown in Table 5, most of the respondents were male (79 respondents or 68.1%). Out of 116 respondents, 54 had attended Higher Certificate Education, which was classified as average in term of education qualification. Of the 116 respondents, 92 were managers, 11 were executives, 8 were board of directors and 5 were others designation. With regard to the respondent's age, most (43.9%) were 36 to 45 years old. Majority of respondents were married (91.4%) and 10 respondents single. The majority of these respondents had been with their present cooperatives between 4 – 6 years. Out of 116 respondents, 93 (80.2%) respondents did not have any working experience with international business firm and 23 (19.8%) had experienced. Majority of the experienced respondents had worked in international business firms between 4 to 6 years.

Table 5: Respondents' Characteristics

Respondent Characteristics (n=116)	Frequency	Percentage
Male	79	68.1
Female	37	31.9
Age (years):		
26 – 35	19	16.4
36 – 45	51	43.9
46 and above	46	39.7
Marital Status:		
Married	106	91.4
Single	10	8.6
Highest Qualification of Respondents:		
Lower Certificate Education	9	7.7
Malaysian Certificate Education	21	18.11
Higher Certificate Education	54	46.6
Polytechnic Certificate/ Skill Certificate	22	19.0
Bachelor's Degree	8	6.9
Others	2	1.7
Designation:		
Manager	92	79.31
Executive	11	9.48
Board of Director	8	6.90
Others	5	4.31
Length of Service (years):		
3 and below	12	10.3
4 – 6	36	31.0
7 – 9	30	25.9
10 – 12	16	13.8
13 and above	22	19.0
Monthly Salary of Respondents (RM):		
1000 and below	61	52.6
1001 – 1500	41	35.3
1501 – 2000	12	10.4
2001 - 2500	2	1.7
Training for the Past Three Years:		
Yes	61	52.6
No	55	47.4
Type of Training:		
Not Training	55	47.4
Entrepreneur	7	6.0
Engineering	7	6.0
Management	41	35.4
Accounting	2	1.7
Others	4	3.5
Working Experience with International Business Firm:		
Yes	23	19.8
No	93	80.2
Number of Organization Worked Before:		
One	39	33.6
Two	54	46.6
Three	18	15.5
Four	4	0.9
Five or more	4	3.4
Nature of Previous Companies Worked:		
Firm Engage in Domestic Business	57	49.1
Firms Engage in International Business	38	32.8
Firms Engage in Domestic and International Business	21	18.1
Number of Years Working With International Business Firm (years):		
1 –3	19	16.4
4 – 6	35	30.2
7 – 9	5	4.3
Not Relevant	57	49.1

Cooperative's' Characteristics

Table 6 displays the characteristics of the 116 cooperatives in the survey. As shown, the majority of the cooperatives have been involved in domestic business between 6 – 10 years old. None of the cooperative has involved in international business. Majority of cooperatives were having between 1 to 20 workers. It shows that cooperatives in Kedah were in small-scale size.

The average annual sales (for the past three years) for the majority of the cooperatives received over RM350,000, 31 (26.7%) cooperatives had sales under RM50,000, 16 (13.7%) cooperatives had sales of between RM300,001-RM350,000, 11 (9.5%) cooperatives had sales of between RM50,001-RM100,000, 6 (5.2%) cooperatives had sales of between RM100,001-RM150,000, 6 (5.2%) cooperatives had sales of between RM250,001-RM300,000, 5 (4.3%) cooperatives had sales of between RM200,001-RM250,000 and 3 (2.6%) cooperatives had sales of between 150,001-RM200,000. In terms of average annual after-tax return on total investment for the past three years, 27 (23.3%) cooperatives signed negative net return on total investment. It showed that majority of cooperatives are facing problems in their business investment for the past three years.

Table 6: Cooperative's Characteristics

Firm Characteristic (n=116)	Frequency	Percentage
Cooperative's Age (years):		
Under 5	16	13.8
6 – 10	35	30.2
11 – 15	27	23.3
16 –20	24	20.7
21 or more	14	12.0
Product Classification:		
Spare Part/ Component Product	67	57.8
Finished Product	49	42.2
Number of Employees:		
1 – 20	50	43.1
21 – 99	45	38.8
More than 100	21	18.1
Average Annual Sales (RM) (past 3 years):		
Less than 50,000	31	26.7
50,000 – 100,000	11	9.5
100,001 – 150,000	6	5.2
150,001 – 200,000	3	2.6
200,001 – 250,000	5	4.3
250,001 – 300,000	6	5.2
300,001 – 350,000	16	13.7
More than 350,000	38	32.8
Average Annual Income after Tax Return on Total Investment (past 3 years):		
Greater than 25%	14	12.1
21% - 25%	12	10.3
15% - 20%	7	6.0
10% - 14%	12	10.3
5% - 9%	26	22.4
0 – 4%	18	15.6
Negative Net Return on Total Investment	27	23.3

DISCUSSIONS

The objective of this study is to determine whether the Kedah's cooperatives have the potential to involve in international business. Findings from the study disclosed that there were 5 major barriers faced by Kedah cooperatives distracting them from engaging in international business. This study also highlighted important incentives, strategies and factors that can influence cooperatives to engage in international business.

Table 7: Summary of the Survey Responses on the Variable of Barriers to International Business

Variables:		Mean	SD
BA1	Differences in products usage in foreign country	3.39	0.92
BA2	Language and cultural differences	3.37	0.97
BA3	Lack of foreign channels of distribution	3.78	0.97
BA4	Difficult to select a reliable distributor in the foreign country	3.62	0.91
BA5	Differences in product specifications in foreign markets	3.42	0.91
BA6	Difficulty collecting payment from foreign customer	3.53	1.00
BA7	Unfamiliarity with government export assistance programs	3.60	1.07
BA8	Foreign business practices are difficult to understand	3.57	1.08
BA9	Confusing foreign import regulations and procedures	3.72	1.15
BA10	Risks involved in selling abroad	3.48	1.06
BA11	Difficulty providing after sales service	3.54	1.00
BA12	High cost of selling abroad	3.69	1.07
BA13	Difficulty arranging a licensing or joint venture agreement with foreign firm	3.43	1.07
BA14	Managerial indifferences toward value of exporting	3.53	1.04
BA15	Enforcement of high export tax by the home government	3.42	0.92
BA16	Lack of government assistance in overcoming export barriers	3.48	1.15
BA17	High value of foreign currency in export markets	3.40	1.08
BA18	Management emphasis on developing domestic markets	3.68	1.12
BA19	Competition from local firms in foreign markets	3.41	1.01
BA20	Lack of capital to finance business expansion into foreign market	3.62	1.09
BA21	Problem quoting price with fluctuating exchange rate	3.60	1.05
BA22	High transportation costs to ship products to foreign markets	3.61	1.14
BA23	Need to modify pricing and promotion policies according to the condition of foreign market	3.59	1.00
BA24	Need to adapt products to meet foreign customer preferences	3.40	1.16
BA25	Lack of capacity dedicated to continuing supply of exports	3.22	1.00
BA26	Lack of tax incentive by the home government for companies that export	3.50	1.12
BA27	Insufficient personnel to manage international trade activity	3.60	1.07
BA28	Difficulty gathering accurate information on foreign market	3.57	1.08
BA29	High foreign tariffs on imported products by foreign government	3.47	1.11
BA30	Competition from firms of our country in foreign markets	3.47	0.95

Note: SD = Standard Deviation;   BA = Barrier

Table 7 shows the barriers to international business faced by cooperative. The major problems are: (based on the top 5 of mean value)
1. Lack of foreign channel of distribution.
2. Confusing foreign import regulations and procedures.
3. High cost of selling abroad.
4. Management emphasis on developing domestic markets.
5. Lack of capital to finance business expansion into foreign market.

Following table is the summary of mean score of barriers to international business. Based on the result, the highest mean score is 17.90 and the lowest mean score is 17.21. It showed difficulty in understanding a foreign business practice is the major barrier for cooperative to engage in international business.

Table 8: Summary of Mean Score of Barriers to International Business

Variable	No. Of Item	Scale	Mean	Standard Deviation
Mean Score for Each Dimension of Barriers to International Business	30	1-5		
1. Differentiation of Product Usage (BA1-BA5)	5	1-5	17.58	2.45
2. Difficult to Understand a Foreign Business Practices (BA6-BA10)	5	1-5	17.90	2.66
3. Different Foreign Business Practices (BA11-BA15)	5	1-5	17.62	2.48
4. Business Competition in International Business (BA16-BA20)	5	1-5	17.59	2.63
5. Difficulty Product Modification (BA21-BA25)	5	1-5	17.78	2.80
6. Lack of International Business Information (BA26-BA30)	5	1-5	17.21	2.78

Table 9 showed the incentives that can stimulate cooperative to engage in international business. The incentives are: (based on the top 5 of mean value)
1. Increase in international marketing experience can improve domestic competitiveness
2. Managerial beliefs about the value of exporting.
3. Improvement in the growth potential of the product market.
4. Entry of foreign competitors in home market.
5. Chances to diversify business into new markets

Table 9: Summary of the Survey Responses on the Variable of Incentives to International Business

Variables		Mean	SD
IN1	Chances to diversify business into new markets	3.61	1.04
IN2	Improvement in the growth potential of the product market	3.63	1.06
IN3	Ability to easily modify products for foreign markets	3.45	1.24
IN4	New information about sales opportunities in foreign markets	3.60	1.13
IN5	Possession of current information's of advance technology	3.62	1.06
IN6	Intensifying competitive rivalry in the home market	3.60	1.17
IN7	Entry of a foreign competitors in our home market	3.23	1.17
IN8	Adverse domestic market conditions	3.59	1.03
IN9	Opportunity to lessen the power of domestic customers	3.70	1.02
IN10	Providing a hedge against an economic downturn at home	3.60	1.13
IN11	Managerial beliefs about the value of exporting	3.54	1.04
IN12	Opportunity to better utilize management talent	3.72	1.10
IN13	Presence of a manager in the unit who is export-minded	3.54	1.15
IN14	Increase in international marketing experience could improve domestic competitiveness	3.50	1.15
IN15	Opportunity to extend the life cycle of domestic products	3.50	1.13
IN16	Opportunity to reduce inventories	3.51	1.21
IN17	Favorable short-term profit opportunities	3.45	1.16
IN18	Availability of unused production capacity	3.36	1.11
IN19	Expectation of potential income growth as a result of increase of total trade	3.53	1.15
IN20	Diminishing growth opportunities in the home market	3.52	1.17
IN21	Moves by national competitors to export	3.39	1.09
IN22	Chance to use obsolete equipment elsewhere	3.23	1.20
IN23	Attractive export incentives offered by government	3.44	1.12
IN24	Awareness of export programs sponsored by the government	3.44	1.11
IN25	Export could make a major contribution to my firm growth	3.60	0.99
IN26	Reduction of tariffs in target countries	3.47	1.04
IN27	Availability of profitable ways to ship products to foreign markets	3.42	1.04
IN28	Decline in value of currency relative to foreign markets	3.41	1.05
IN29	Eased export regulations in foreign countries	3.41	1.09
IN30	Receipt of unsolicited orders from foreign buyers	3.31	1.13

Note: SD = Standard Deviation
     IN = Incentive

In Table 10 showed that the majority of cooperative have chosen the export incentive offered by government as a good incentive to engage in international business. It scored the highest mean score of 17.76.

Table 10:Summary of Mean Score of Incentives to International Business

Variable	No. of Item	Scale	Mean	Standard Deviation
Mean Score for Each Dimension of Incentives to International Business	30	1-5		
1. Business Expansion (IN1-IN5)	5	1-5	17.69	2.46
2. Instability of Domestic Market (IN6-IN10)	5	1-5	17.69	2.69
3. Export Incentive Offered by Government (IN11-IN15)	5	1-5	17.76	2.83
4. Increase Profit (IN16-IN20)	5	1-5	17.36	2.86
5. Main Contribution to Firm's Growth (IN21-IN25)	5	1-5	17.10	2.60
6. Increase the Business Stability (IN26-IN30)	5	1-5	17.03	2.68

By looking at the summary of the survey responses on the variable of strategies to international business, it showed that contract manufacturing is the best mode for cooperative to engage in international business.

Table 11: Summary of the Survey Responses on the Variable of Strategies to International Business

Variables		Not Important	Undecided	Important
S1	Direct Export	19.0	31.9	49.1
S2	Licensing	13.8	31.9	54.3
S3	Contract Manufacturing	13.0	29.3	57.7
S4	Joint Venture	16.4	27.6	56.0
S5	Management Contacting	18.1	25.9	56.0
S6	Assembly Operations	12.1	35.3	52.6
S7	Foreign Manufacturing Subsidiary	13.8	31.0	55.2

Note: S = Strategy

Table 12 showed that the efficient production method, dynamic sales force, possession of high technology, unique product and efficient marketing technique were the factors to be considered before a cooperative engage in international business.

Table 12: Summary of the Survey Responses on the Factors to be considered before a Cooperative Engage in International Business

Variables		Not Important	Undecided	Important
F1	Efficient Distribution	17.3	22.4	60.3
F2	Adequate Resources to Export	13.0	22.4	64.6
F3	Proximity to the Market	19.0	25.0	56.0
F4	Strong Management	16.4	26.7	56.9
F5	Efficient Marketing Technique	7.8	21.6	70.6
F6	Possession of High Technology	6.9	20.7	72.4
F7	Competitive Price	7.8	40.5	51.7
F8	Unique Product	6.9	22.4	70.7
F9	Efficient Production Method	1.7	23.3	75.0
F10	Dynamic Sales Force	2.6	23.3	74.1

Note: F = Factor

CONCLUSION

The study managed to highlight significant predictors of barriers and incentives for cooperative engaging in international business. The government and financial institution in Malaysia can use the findings from the research as guidance to modify their current policies in encouraging cooperatives to engage in international business. Based on the findings in this study, researchers have discovered that there are 5 main barriers experienced by cooperatives engaging international business. The barriers are: (1) Lack of foreign channel of distribution; (2) confusing foreign import regulations and procedures; (3) high cost of selling abroad; (4) management emphasis on developing domestic markets and (5) lack of capital to finance business expansion into foreign market.

By understanding the problems faced by cooperatives, government can create policies to encourage cooperative to engage international business. Moreover, cooperator should equip themselves through various programmes such as training, cooperative education and information searching. Cooperatives should also improve their managerial skills and increase technological oriented among cooperator. Finally, cooperative should be aggressive and proactive in doing the cooperation with their alliances.

REFERENCES

Abdul Jumaat Mahajar (2000). "The Internationalisation of Malaysian Business and Its Relevance to Malay Entrepreneurs". Ph.D.

Abdullah Ahmad Badawi (2003). Teks Ucapan sempena Majlis Perasmian Mesyuarat Agung Koperasi Peserta-peserta Felcra Berhad (KPFB) ke-22, 9 Ogos 2003.

Arun Boon Tiang (1996). Koperasi Harus Dinamik, Utusan Malaysia, 18 Disember 1996.

Asan Ali Golam Hassan (1998), Gerakan Koperasi Di Malaysia : Peranan dan Strategi Dalam Pembangunan Negara, Universiti Utara Malaysia, Sintok.

Barret, N.I., dan Wilkinson, I.F. (1985). "Export Stimulation: A Segmentation Study of the Exporting Problems of Australian Manufacturing Firms". European Journal of Marketing 19(2), 53-72.

Beamish, P.W. (1990), 'The Internationalisation Process For Smaller Ontario Firms : A research Agenda", In Rusman, A. (Eds.) Research in Global Strategic Management. Greenwich, Conn.:JAI Press.

Bilkey, W.J. (1978). "An Attempted Integration of the Literature on the Export Behavoiur of Firms". Journal of International Business Studies, (Spring/ Summer), 33-46.

Bilkey, W.J., and Tesar, G. (1977). " The Export Behaviour of Smaller-sized Wisconsin Manufacturing Firms". Journal of International Business Studies, Spring/Summer, 93-98.

Cavusgil, S.T (1984), " Organisational Characteristics Associated with Export Activity". Journal of Management Studies, 21(1), 3-22.

Cik Putih Ayub (1981). Faedah Koperasi di Malaysia, Kertas Kerja terbitan Maktab Kerjasama Malaysia, Petaling Jaya.

Dasar Koperasi Negara Garis Lapan Strategi Utama, Utusan Malaysia, 30 Januari 2004.

Idris Ismail dan Mohd Safaai Said (1987), Koperasi Satu Pengenalan, Maktab Kerjasama Malaysia.

Mahmud Mohamed (1995). Pergerakan Koperasi, Utusan Malaysia, 16 Mei 1995.

Malaysia (1991a). Laporan Majlis Perundingan Ekonomi Negara (MAPEN), Kuala Lumpur: Jabatan Percetakan Negara.

Mat Hassan Esa (2000). Kecenderungan Baru Dalam Amalan Perniagaan di Dunia Tanpa Sempadan, Dewan Ekonomi, Ogos 2000.

Menghidupkan Peranan Koperasi, Utusan Malaysia, 23 Julai 2003.

Meredithh, L. (1984). "U.S. Multinational Investment in Canadian Manufacturing Industries". Review of Economic and Statistics, (February), 66. 111-119.

Mohd Zohadie Bardaie (2003). Teks Ucapan Naib Canselor Universiti Putra Malaysia sempena Majlis Mesyuarat Agung Tahunan ke-21 Koperasi Universiti Putra Malaysia, 28 Jun 2003.

Pemakaian Jati Diri Tadbir Urus Yang Baik Koperasi, Kertas Kerja Dalam Persidangan Khas Negeri 2002, ANGKASA, 20 Ogos 2002.

Prof. DiRaja Ungku A. Aziz (1983), Prinsip-prinsip Koperasi, ANGKASA.

Sullivan, D., dan Bauerschmidt,A. (1990). "Common Factors Underlying Barriers to Export: A Comparative Study in the European and US Paper Industry". Management International Review, 29(2), 17-32.

Yaprak, A. (1985). " Emprical Study of the Differences between Small Exporting and Non-Exporting US Firms". International Marketing Review, 23,72-83.

Zainal Abidin Hashim (1997). Koperasi Di Malaysia: Asas dan Pergerakan.Dewan Bahasa dan Pustaka,Kuala Lumpur.

The Ethics of Faculty Behaviour: Academicians' Views

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ABSTRACT

Interest in the professional and ethical conduct of faculty is stimulated by the impact of recent generations of lecturers. Higher education is undergoing a shift from the traditional paradigm in academic life to a 'new academic culture' (Kerr, 1994). According to Kerr, the old academic ethics of teaching, advancing knowledge and citizenship responsibilities within the campus community is being neglected in favor of new off campus interest. When this happen, faculty are less committed to the academic community, to serve on committees and to participate in campus governance. They have stronger commitment to individual economic opportunities off-campus and to promoting personal political concerns on campus. This paper reports lecturers' perceptions on the ethicalness of some actions in academia; the propensity of doing the action and how they perceive their colleagues would react to the actions. Respondents are lecturers from a management faculty of a public university. Questionnaires were distributed to the respondents and questions asked were from previous studies by Morgan (2001) and Marshall et. al (1998). It is found that they perceive 18 out of 22 actions in the questionnaire distributed as unethical. Lecturers admitted that teaching materials they have not really mastered, inappropriately giving a colleague a co-authorship status and using university equipment for personal activities are common actions that they do. Among reasons of doing so are either they are under pressure, they have no choice or they perceive that the action is merely ethical. Study reveals that lecturers have the propensity of performing unethical behaviour in academic though the likeliness is low. However, they have a high degree of perception that their colleagues would likely perform the action.

INTRODUCTION

The professional and ethical conducts of faculty are of special concern to the public for a number of reasons. First, faculty can strongly influence the overall ethical climate of the university environment (Schulte et.al., 1991). Second, the conduct of faculty affects the moral development of students (McNeel 1994a; Lisman, 1996). Third, teaching is commonly viewed as a noble profession with special privileges and responsibilities (Goodlad, 1990). And fourth, as faculty produce the nation's future leaders, it shoulders the responsibility to ensure quality and high ethical standards of graduates.

Ethics plays an important role in everyday life. The term ethics commonly refers to the rules and principles that define right and wrong conduct (Curtin University, 2001). Whether an individual acts ethically or unethically is the result of a complex interaction between the individual's stage of moral development and several moderating variables including individual's characteristics, organization's structured design, the organization culture and intensity of the ethical issues. Higher learning institution such as a university has a vital role in not merely teaching ethics but to be perceived as an ethical institution as well. With the university focusing more on business generating activities to sustain itself, ethics is of paramount consideration. Ethics should play a central role in a university and not merely a cosmetic role.

BACKGROUND OF THE STUDY

We often hear about ethical violations of students, but less is mentioned about the ethical violations of academicians (Gershaw, 1997). Roworth (2002) claimed that most academicians do not give much thought to professional ethics as they carry out their duties. This should not be the case because academics are committed to the discovery, propagation of ideas and knowledge and dissemination of truth. Truth may vary depending on perspective, gender, culture and other factors, but the ultimate goal of the faculty or university lecturers is to ascertain the truth and share

it with students and peers (Hauptman, 2002). Despite this, academicians often face ethical dilemmas include loyalties to the search for truth vs. loyalties to consulting clients, commitment to teaching vs. research and commitment to remain current in the discipline vs. pressures of other duties. In addition, many dilemmas appear to result from the incongruency of profit motives in industry on one hand and university goals on the other (Marshall, et.al, 1998).

From professors to undergraduate students, the academy confronts a growing ethical deficit (Hauptman, 2002). We may read about a case of plagiarism or hear about scientific fraud at another university, but such serious violations seem to be rare or distant from our daily routines. Faculty who have no problem expressing views on teaching strategies, research methods, or university politics hesitate to question a colleague's conduct in the classroom, the space in which each professor or lecturer reigns supreme.

Many have argued that ethics cannot be simplified as right or wrong; this is why ethics should not be taught but lived. In a university, ethics should not only be looking at the theoretical side, those who preach, must practice ethics while those who learn must inculcate and ask themselves whether they have actually prepared to face the challenges of ethics.

PROBLEM STATEMENT

Many researches addressed issues on how ethics should be instilled or stressed the way ethics should be taught. They talked about the need to have ethical standards and the role played by the academicians, parents and society. It is reported that 'while society entrusts parents with the responsibility of instilling ethical values, in recent years business schools have taken an increasingly larger role in this area'. The question is: if academicians are to teach ethics and make sure that students are prepared with ethical challenges, do these academicians really practice what they preach? The most difficult ethical problems faced in current academic teaching and researches are questions of policing breaches of copyright, abuse of intellectual property rights and plagiarism.

According to Mc Bee (1982), the academic community cannot expect the right conduct and moral development of students unless the institution itself is an example of noble behaviour. This includes, not only the institution's policies and practices, but also the character of faculty. Where noble is concerned, the definite demarcation line between ethical and unethical behaviour or action has to be established, but is not an easy task. In this study, unethical actions are actions against the academic rules or code of conduct. The unethical actions may not be in any of the guidelines but if the actions will harm or give a negative impact, either little or enormous to other parties, it is generally understood that the actions are unethical. For example, prohibition of accepting publishers' monetary rebate for adopting publishers' text books may not be in the code of ethics, but when lecturers do this, it is the students who are actually paying for the 'extra income' that lecturers receive. This commonly would not be accepted. In academia, students are the ultimate customers or the main concern while other parties or stakeholders would involve members of the faculty itself, university members as a whole, government, the industry or the future employers of the students, parents and society. Therefore, actions would be considered as unethical when the actions would directly or indirectly concern others.

We often hear about students who cheat. But when lecturers or educators cheat, do they ignore and see cheating as merely trying to resolve dilemmas or react on the unethical behaviour? (Hauptman, 2002). Not many studies attempt to describe the ethical behaviour of academicians in academic programs and university classrooms.

SCOPE AND OBJECTIVES OF STUDY

This paper focuses on ethical actions in academia. Academic refers to activities including teaching, conducting research, lecturer-student interaction and participating in conferences or seminars. The following objectives have been developed to achieve the aim of the study:
  (i)   To identify lecturers' perceptions on the ethics in academics.
  (ii) To seek the practice of ethics among lecturers.
  (iii) To determine the lecturers' propensity of performing unethical actions.
  (iv) To identify lecturers' perceptions on their colleagues' propensity of performing unethical actions.

LIMITATIONS OF STUDY

When doing the survey, researchers faced the challenge of collecting questionnaires distributed to the lecturers. Additionally, answers provided are assumed to be of honest and true. Findings of this study should not be generalized.

LITERATURE REVIEW

Interest in the professional and ethical conduct of faculty is also stimulated by the impact of recent generations of lecturers. Higher education is undergoing a shift from the traditional paradigm in academic life to a "new academic culture" (Kerr, 1994). According to Kerr, the old academic ethics of teaching, advancing knowledge and citizenship responsibilities within the campus community is being neglected in favor of new off campus interest. When this happen, faculty are less committed to the academic community, to serve on committees and to participate in campus governance. They have stronger commitment to individual economic opportunities off-campus and to promoting personal political concerns on campus. For many faculties, the academic environment has become a means to non-academic ends.

A report revealed that faculty now spends less time with students (Milem et.al, 2000). Gone are the days when lecturers and students interact frequently and devote themselves towards teaching excellence. Changes in academia has set great challenges to lecturers, for one, lecturers are now expected to not only perform the teaching and academic advice, but doing research, consultancies, publications as well as doing social services. Stakeholders of education institutions value teaching, as they perceive that lecturers or academicians should play the role as a shaper of minds and values. However, we reward research and scholarly publication. Teaching seems to be secondary in the eyes of University top management and lecturers themselves. Thus, students may come to be disappointed when their mentors do not live up to expectations.

According to Smith (1996), faculty in universities proclaim their commitment to being effective teachers and scholars, to searching for truth, and to working as effective problem solvers. Yet, there are gaps between what we say and what we do, as well as our awareness of these gaps. In higher education institutions, codes of ethics are placed to ensure that principles are ingrained in the academic staff routine to achieve the organizations' objectives. Codes are hoped to be a guide in combating fraud and carrying out the duties and responsibilities as academicians. Academicians should not only comprehend, adopt, practice and transmit knowledge for the benefit of mankind, but must also abide by a set of high moral values, consistent with the standing of an educationist, which could inspire and be emulated by their personal conducts, attitudes and principles. The code has underlined rules in conducting the core responsibilities for the academicians to refer to. It highlights the importance of maintaining integrity and ethics while carrying out the duties.

A study by Scales (2002) examines the ethical beliefs and behaviours of full-time community college faculty in United States. Respondents report to what degree they practice sixty-two behaviours as teachers and whether they believe the behaviours to be ethical. Scales used questionnaire developed by Tabachnik et. al (1991) which contained sixty two questions relating to eight distinct areas relating to teaching namely course content, evaluation of students, education environment, conduct related to fitness for duty, research and publication issues, financial and material transactions, social relationships with students and sexual relationships with students and co-workers.

The study found that survey participants engaged in few of the behaviours and only reported two actions as ethical namely, accepting inexpensive gifts from students and teaching values or ethics. The college faculty holds the belief that it is ethical to teach values to students, to hug them and accept inexpensive gift items from their students. Using school resources to publish research or to work a second job is also not seen as unethical. Scales reported that faculty are less likely to believe that behaviours of a sexual nature, inappropriate or ill-prepared course content nor that unfair treatment or taking advantage of students financially or otherwise should be tolerated as ethical. Additionally, engaging in the use of alcohol, drugs or other illegal substances should not be tolerated as ethical according to the college faculty.

The study also reported diverse responses to questions about behaviour of a sexual nature, but most agreed that sexual relationship with students or colleagues at the same, higher or lower rank were unethical. Additional findings relate to the presence of diversity among the faculty, using school resources to publish textbooks and external publications, selling goods to students and an expansive list of other behaviours.

Scales (2002) reported that faculty members show congruence between what respondents report as ethical beliefs and report as teaching practice (81% of the items). Behaviours of the majority of faculty at the institutions represented in his study are likely to be consistent with their beliefs about ethical and unethical behaviour. In other words, if they believe the behaviour to be unethical, most of the faculty in this situation will not practice such behaviour. If they, on the other hand, believe a behaviour is ethical, they will more often than not, have engaged in the behaviour. Beliefs and behaviours that are not correlated are teaching that certain races are inferior, accepting undeserved authorship of a student's paper, teaching under the influence of alcohol, sexual relationships with both same rank and higher or lower ranked faculty.

Another study by Vargas (2001) on lecturers' perceptions indicates that using profanity/offensive words in lectures as ethical since 75% of the respondents perceive as so. In addition, the study reveals that faculty members aged 35 and below had a more willing attitude to teach material the have not really mastered or to teach when not adequately prepared.

Institutions of higher education have the mission to cultivate the moral and ethical development of students. The ability of the University to accomplish this mission rests in part upon the moral and ethical quality of its faculty members. The study of Vargas (2001) suggests that the teaching profession should be more attentive to ethical and moral issues and more willing to engage in self-examination of attitudes and behaviour of its members.

METHODOLOGY

The survey method was employed in this study. The instruments were divided into five sections consisting of the information below:

Objective	*Scale*	
Demographic information	Nominal	
Perceptions on ethical situations	Likert scale:	
	1 - Totally Ethical	2 – Slightly Unethical
	3 - Moderately Unethical	4 - Moderately to Extremely
	5 - Extremely Unethical	Unethical
Experience in performing the ethical situations	1 – Never	2 - Once or twice
	3 –More than twice	4 - Frequent
Likeliness of doing the actions	1 - Very Unlikely	2 – Unlikely
	3 – Likely	4 – Very likely
Perceptions whether their colleagues would behave unethically	1 - Very Unlikely	2 – Unlikely
	3 – Likely	4 – Very likely

A list of 22 items on ethical behaviour in academic was used to identify lecturers' ethical perceptions and ethical practice. The items have been used by a number of researchers in the faculty behaviour. The study has adept Marshall et.al (1998) and Morgan (2001) in constructing the instrument. A descriptive analysis was performed on the data set. The reliability test was conducted using Cronbach Alpha method to determine the internal consistency of the agreement made by these respondents.

RESEARCH FINDINGS

Lecturers of a faculty in a public university have responded to the questionnaires. The reliability test was conducted using Cronbach Alpha method to determine the internal consistency of the agreement made by these lecturers on the 22 items. Results of the test show that the items internal reliability is high at Alpha value of 0.9613. The study tried to seek whether demographic influence (i.e. gender, education background) exists in their perceptions or propensity, but found no relation in the analysis.

Table 1: Perceptions On Ethical Situations

	Totally Ethical (%)	Slightly Unethical (%)	Moderately Unethical (%)	Unethical (%)	Extremely Unethical (%)
Giving easy tests or courses to ensure popularity.	6.8	6.8	11.4	20.5	54.5
Accepting publishers' monetary rebate for adopting publishers' text books	23.1	5.1	17.9	12.8	41.0
Using profanity/offensive words in lectures.	4.7	4.7	7	18.6	65.1
Having an intimate relationship with a student.	16.7	7.1	7.1	14.3	54.8
Teaching material that the lecturers have not really mastered	12.5	17.5	17.5	25	27.5
Not giving graduate student(s) co-author ship on publications.	6.8	6.8	2.3	25	59.1
Inappropriately giving a colleague a co-authorship status	4.5	9.1	6.8	34.1	45.5
Presenting the same research to more than one regional or annual meeting.	9.1	9.1	9.1	38.6	34.1
Padding an expense account.	7.7	2.6	7.7	20.5	61.5
Attending a meeting at university expense and not substantively participating (most of the time spent sight-seeing, etc).	9.1	4.5	9.1	22.7	54.5
Neglecting university responsibilities due to outside employment.	6.8	4.5	2.3	18.2	68.2
Using university equipment for personal activities.	4.7	7	7	41.9	39.5
Using student assistants for personal work	9.1	9.1	6.8	27.3	47.7
Canceling office hours excessively.	9.5	7.1	4.8	33.3	45.2
Accepting money or gifts for grades.	11.4	0.0	2.3	0.0	86.4
Dating a student in his or her class.	14	0.0	2.3	14	69.8
Dating a student not in his or her class who is not majoring in the lecturer's discipline.	9.5	9.5	9.5	11.9	59.5
Allowing a relative or friend in class and giving them preferential treatment.	16.3	4.7	0.0	18.6	60.5
Allowing a student assistant to grade non-objective exams and/or written assignments that require significant judgment.	16.3	2.3	4.7	18.6	58.1
Canceling classes when the faculty member is not ill and has no other University related commitments.	14.3	4.8	11.9	21.4	47.6
Using outdated text to avoid the effort necessary to revise notes, etc	14	16.3	4.7	32.6	32.6
Falsifying activity reports that are utilized by his or her institution for raises, promotion, or tenure evaluations.	14	2.3	0.0	9.3	74.4

After seeking lecturers' perceptions on the actions above, they are asked whether they have experienced or have performed such actions. The result is presented as following:

Table 2: Experience In Performing The Ethical Situations:

	Once or twice (%)	More than twice (%)	Frequent (%)	Never (%)
Giving easy tests or courses to ensure popularity.	2.3	2.3	0.0	95.5
Accepting publishers' monetary rebate for adopting publishers' text books	28.2	0.0	0.0	71.8
Using profanity/offensive words in lectures.	9.5	2.4	2.4	85.7
Having an intimate relationship with a student.	7.5	2.5	2.5	87.5
Teaching material that the lecturers have not really mastered	35	12.5	2.5	50
Not giving graduate student(s) co-author ship on publications.	0.0	2.3	0.0	97.7
Inappropriately giving a colleague a co-authorship status	15.9	2.3	0.0	81.8
Presenting the same research to more than one regional or annual meeting.	9.1	2.3	0.0	88.6
Padding an expense account.	7.5	0.0	0.0	92.5
Attending a meeting at university expense and not substantively participating (most of the time spent sight-seeing, etc).	15.9	4.5	2.3	77.3
Neglecting university responsibilities due to outside employment.	13.6	0.0	2.3	84.1
Using university equipment for personal activities.	41.9	4.7	2.3	51.2
Using student assistants for personal work	7	2.3	0.0	90.7
Canceling office hours excessively.	33.3	2.4	0.0	64.3
Accepting money or gifts for grades.	0.0	2.3	0.0	97.7
Dating a student in his or her class.	2.3	0.0	0.0	97.7
Dating a student not in his or her class who is not majoring in the lecturer's discipline.	4.7	0.0	0.0	95.3
Allowing a relative or friend in class and giving them preferential treatment.	4.7	0.0	0.0	95.3
Allowing a student assistant to grade non-objective exams and/or written assignments that require significant judgment.	2.3	0.0	0.0	97.7
Canceling classes when the faculty member is not ill and has no other University related commitments.	21.4	2.4	0.0	76.2
Using outdated text to avoid the effort necessary to revise notes, etc	23.3	0.0	0.0	76.7
Falsifying activity reports that are utilized by his or her institution for raises, promotion, or tenure evaluations.	4.7	0.0	0.0	95.3

Although some respondents may yet experienced or involved in the situations, they were further asked whether they would likely perform the actions if they were to be in the unethical situations. Besides that, the respondents were also asked to perceive whether their colleagues would perform those actions. The findings are shown below:

Table 3: Perceptions Of Likeliness The Lecturers Would Perform The Unethical Behaviour And Their Perceptions On The Likeliness That Their Colleagues Would Do The Same Action.

	Lecturer (%)	Colleague (%)
Giving easy tests or courses to ensure popularity.	4.7	39.5
Accepting publishers' monetary rebate for adopting publishers' text books	31.6	48.6
Using profanity/offensive words in lectures.	2.4	13.5
Having an intimate relationship with a student.	12.2	35.1
Teaching material that the lecturers have not really mastered	30.8	58.8
Not giving graduate student(s) co-author ship on publications.	2.3	44.7
Inappropriately giving a colleague a co-authorship status	7	44.8
Presenting the same research to more than one regional or annual meeting.	11.9	52.6
Padding an expense account.	7.5	37.2
Attending a meeting at university expense and not substantively participating (most of the time spent sight-seeing, etc).	18.6	47.4
Neglecting university responsibilities due to outside employment.	2.3	47.4
Using university equipment for personal activities.	21.4	59.4
Using student assistants for personal work	7.1	40.5
Canceling office hours excessively.	14.6	40.5
Accepting money or gifts for grades.	2.3	10.8
Dating a student in his or her class.	2.3	15.8
Dating a student not in his or her class who is not majoring in the lecturer's discipline.	0.0	24.3
Allowing a relative or friend in class and giving them preferential treatment.	0.0	27.0
Allowing a student assistant to grade non-objective exams and/or written assignments that require significant judgment.	0.0	27.0
Canceling classes when the faculty member is not ill and has no other University related commitments.	7.5	27.8
Using outdated text to avoid the effort necessary to revise notes, etc	7.3	32.4
Falsifying activity reports that are utilized by his or her institution for raises, promotion, or tenure evaluations.	2.4	24.3

CONCLUSIONS AND DISCUSSIONS

All 22 items in the questionnaire are unethical behaviours in academia. Respondents are expected to view these behaviours as unethical. However, this study found responses for 'totally ethical' in all items. The highest ten items (above 10%) viewed by lecturers as totally ethical are; (1) accepting publishers' monetary rebate for adopting publishers' textbooks, (2) having an intimate relationship with a student, (3) allowing a relative or a friend in class and giving them preferential treatment, (4) allowing a student assistant to grade non-objective exams and /or written assignment that require significant judgment, (5) cancelling classes when the faculty member is not ill and has no other university related commitments, (6) using outdated text to avoid the effort necessary to revise notes, (7) falsifying activity reports that are utilized by his or her institution for raises, promotion, or tenure evaluations, (8) dating a student in his or her class, (9) teaching material that the lecturers have not really mastered and (10) accepting money or gifts for grades.

The actions that most lecturers perceive as 'extremely unethical' (more than 60%) are accepting money or gifts for grades (86.4%), falsifying activity reports that are utilized by his or her institution for raises, promotion, or tenure evaluations (74.4%), dating a student in his or her class (69.8%), using profanity/offensive words in lectures (65.1%), padding an expense account (61.5%), allowing a relative or friend in class and giving them preferential treatment (60.5%). On the other hand, the least percentage of respondents who perceive the actions being 'extremely unethical' are using outdated text to avoid the effort necessary (32.6%) and teaching material that the lecturers have not really mastered (27.5%).

The study found that there are 'once or twice' responses for all behaviours. Unethical actions that most lecturers do are using university equipment for personal activities, teaching material that the lecturers have not really mastered and canceling office hours excessively. Using university equipment for personal activities is a common practice in the faculty due to lack of control and enforcement by the faculty and university. Since it is done collectively, everybody perceives it as acceptable. In addition, it is convenient to use equipment that is available because it is time saving as well as cost saving for the individual.

Teaching material that lecturers have not really mastered does occur in the faculty. Respondents feel that it is beyond their control because it is a kind of directive responsibility. Respondents justified that they cancel office hours excessively due to the need of doing some academic and non-academic job outside the office. The study also seeks the reasons of unethical behaviour admitted by the lecturers. Lecturers behave unethically for the reasons that:

    (1) they perceived the actions as ethical,
    (2) they think the action is ethical since everyone is doing it,
    (3) they were under pressure,
    (4) they had no choice.

The findings of the study reveal that the likeliness of respondents committing the unethical behaviour is rather low compared to the likeliness of their colleagues doing it. In other words, they perceive that their colleagues would perform the unethical behaviours more than they themselves. Among behaviours that show great disparity are giving easy test or courses to ensure popularity, not giving graduate students co-authorship when the students' contributions justified co-authorship, inappropriately giving a colleague a co-authorship status, presenting the same research to more than one regional or annual conference, neglecting university's responsibilities due to outside employment and using university equipment for personal activities. The disparities occur probably because the ethical awareness of the respondents is higher than their colleagues who may not be among the respondents.

This paper has outlined the following recommendations in improving ethical awareness, ethical perceptions and hence, the ethical climate of the University. Both University and faculty have to seriously play the role in promoting ethics, code of ethics is just inadequate.

In the faculty level, there should be more effective monitoring of faculty conduct and appropriate strategies for personal and professional development. A disciplinary committee should be established. In addition, the faculty should set a good example (role model) to students in relation to ethical values and practice. And most importantly, there must be frequent reinforcement including punishment.

On the other hand, the University should develop and communicate ethical values through ethics seminar, training, and colloquium. University should also focus on the quality of personnel and professional development programs for both students and faculty. University administrators should set a good example or role modeling to faculty members and students as a whole. The curriculum should emphasize in integrating ethics in all subjects taught. Code of ethics has to be made more aware to all University members. Vague areas in the code must be made clearer so that it does not only serve as a general guidelines but also a specific reference when ethical concerns arise.

It is reasonable to hold academics to a high moral standard, as they are in a prime position to influence young minds through their modeling and control information. Faculty also conducts research and through it often influences public opinion and contributes to social constructions of "truth" and morality. Faculty obtains monies from public and private sources to fund research, which may also support the training of future academics. As such, there is a great deal of autonomy afforded faculty, as well as a great deal of responsibility to the public, to academia, to the institution and to students whom they teach and mentor.

The setback in dealing with unethical behaviour is when cases are treated with discretionary and with "an eye close to the law". When rules and regulations are not "above" the leaders of an organization, consequences of unethical or unprofessional behaviour vary among members and within the University system. Though the picture is not pretty, it is important that this professional group to take action now to preserve their credibility. Many have argued that ethics cannot be simplified as right or wrong; this is why ethics should not be taught but lived. In a university, ethics should not only be looking at the theoretical side, those who preach, must practice ethics while those who learn must inculcate and ask themselves whether they have actually prepared to face the challenges of ethics.

REFERENCES

Curtin University. (2001). *Power and Responsibility: Practical Ethics in the life of a University*. Ethics, Equity and Social Justice.

Gershaw D.A. (1997). *Ethics In Teaching*. A Line of Life.

Goodlad, J.I. (1990). *The Occupation Of Teaching In Schools*. In Vargas, R.A.C. (2001). The Moral Profession: A Study of Moral Development and professional Ethics of Faculty. PhD. Dissertation. The University of Texas at Austin.

Hauptman, R. (2002). *Dishonesty In The Academy*. Academe. Nov./Dec. 2002.

Marshall, L.L., Campbell, D. and Hogan, E.A. (1998). *Business Students' Perceptions Of Potential Ethical Dilemmas Faced By Faculty.* Teaching Business Ethics. Vol: 1.

McNeel, S.P. (1994). *College Teaching And Student Moral Development.* In Vargas, R.A.C. (2001). The Moral Profession: A Study of Moral Development and professional Ethics of Faculty. PhD. Dissertation. The University of Texas at Austin.

Morgan, B.L. and Korschgen, A.J. (2001). *The Ethics Of Faculty Behaviour: Students' And Professors' Views.* College Student Journal, Sept. 2001. Vol. 35 Issue 3.

N.A. (2003). *Indonesian* Educators *Plagued By Lack Of* Ethics*, Plagiarism.* Jakarta Post (Indonesia). 07/05/2003.

Roworth, W.W (2002). *Professional Ethics Day By Day.* Journal of High Education. July – August 2002.

Scales, R.F. (2002). *Ethics of Teaching: Beliefs and Behaviours of Community College Faculty.* PhD Dissertation. University of North Texas.

Schulte, L.E., Brown, R.D. and Wise, S.L. (1991). *The Development And Validation Of The Ethical Climate Index For Graduate And Professional School Programs.* Research In Higher Education.

Keith-Spiegel, P.K., Tabachnik, B. and Allen, M. (1993). *Ethics In Academia: Students' Views of Professors' Actions.* Ethics and Behaviour Journal. Vol. 3 Issue 2.

Lisman, C.D. (1996). *The Curricular Intergration of Ethics.* Westport, CT: Praeger.

Kerr, C. (1994). *Higher Education Cannot Escape History: Issues For The Twenty-First Century.* New York: State University of New York Press.

Smith, R.A. (1996). Reflecting On The Ethics And Values Of Our Practice. In Bruhn, J.G., Zajac, G., Ali A. Al-Kazemi, Loren D.P. Jr. (2002). Moral Positions And Academic Conduct. The Journal of Higher Education. Columbus. Jul/Aug. 2002. Vol. 73 Issue 4.

Tabachnick, B.G., Keth-Spiegel, P.C. and Pope, K.S. (1991). *Ethics of Teaching: Beliefs and Behaviours of Psychologists As Educators.* American Psychologist, 46.

Vargas, R.A.C. (2001). The Moral Profession: A Study of Moral Development and Professional Ethics of Faculty. PhD Dissertation. The University of Texas at Austin.

Is Service Revolution about to Begin in Malaysia?

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ABSTRACT

It is widely noted that service revolution had took place in most developed economies. This is reflected in that the service sectors have been major contributors to the developed countries' economic growth. The contribution ranges from above 60% to as high as 80% of GDP and is growing. Other key economic indicators have also reflected the service revolution phenomena in the developed economies. Is such a phenomena about to begin in Malaysia? This paper discussed the service revolution phenomena in terms of a developing country's perspectives. Stages of historical business developments in relation to evolving frontiers of business competitiveness are discussed to show how service dimension has emerged as the new frontier. Findings on current key Malaysian services sector economy are then presented as indicators on whether service revolution is about to begin in Malaysia. The nature of service driven competition is then discussed in the context of the so called "Service Economy" environments. Viewing service as a source of competitive advantage in the service revolution era, its implications for Malaysian managers are then discussed. Statements advocating services sector as the next engine of growth from prominent figures within Malaysian business circle are quoted to emphasize the stage of service revolution that is taking place in Malaysia.

INTRODUCTION

Historically, the frontier of business competitiveness has gone through different stages before service dimension became the frontier. A number of authors have written on the historical development of business management by explaining the focus of competition in each stage of the development.

Davis Jr and Manrodt (1991) for example, categorised the development of manufacturing business management into five different eras; production, distribution, marketing, quality, and the service era. In each of those era, management's focus for gaining a competitive edge evolved from merely production-specific to service know-how. Vandermerwe and Rada (1988) also categorised the development of business management in terms of moving more towards service activities through three overlapping stages; first it's either goods or service producer; second, producer of both goods and services; and third, producer of "bundles" of customer offerings in the form of goods, services, support, knowledge, and self service with services being the lead role.

Singh (1990) is another author who described the development of business management in terms of factors that assumed dominant importance at each stage of what he described as the natural evolution of markets. He categorised the evolution into four stages (although it may not happen one at a time, or in any sequential order) whereby technology was the most crucial factor in the first stage and firms with access to the right technology may be the only one to offer a product (example is Xerox Corporation with its copier technology). The second stage is characterised by many firms that have already gained access to the particular technology, which leads to cost becoming the dominant factor and firms with cost leadership having the competitive advantage. In the third stage; once cost differentials became saturated- quality emerged as the dominant factor with the Japanese manufacturers generally being the leaders especially in consumer electronic products. Finally, in the fourth stage when the market leaders are able to offer basically the same (similar) costs and quality (as in most mature industries)- service became the dominant factor in seeking sustainable competitive advantages for firms.

Gronroos (1988) pointed out that although traditional marketing activities are as important as ever, they are also no longer sufficient in this era of new competition (i.e. service competition). He argued that marketers facing this new competition require a new way of thinking and that way is service know-how. It is therefore imperative for managers to recognise the strategic importance of service dimension to their business competitiveness and be able to utilise it effectively. Adding value through services will benefit supply firms in terms of enhanced profitability, improved customer satisfaction and as a basis for sustainable competitive advantage (Donaldson and Domegan, 1992).

Today, a large component of the added value in customer offerings is going into services and also the fact that many services are already built into goods (Vandermerwe & Rada, 1988). Many information services for example are embodied and carried in the product itself. Vandermerwe & Rada (1988) also introduced the term "servitization of business", which they referred to as "bundles" (goods, services, support, knowledge, and self service) of customer offerings by firms with services being in the lead role. They argued that forces such as
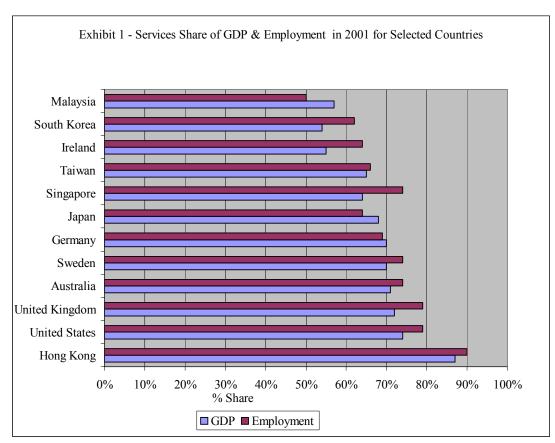
deregulation, technology, globalisation, and fierce competitive pressure are moving manufacturers (or service firms alike) more dramatically into services. Further, increased liberalisation will increasingly provide more opportunities for adding scope and value through services on a global basis, making firms realise that it is the service-end of their business which will continue to account for increasing amounts in sales and profits (Vandermerwe and Rada, 1988).

The preceeding discussions on frontiers of business developments indicated that service revolution had taken place especially within businesses in the developed economies as more value additions are being created through service dimension. Service revolution effect is reflected in the developed countries' economies, whereby the service sectors have contributed toward a larger portion of their GDPs. The US for example, has been registering about 80% of its GDP from the service sectors' accounts and the trend is increasing.

The interest on whether such developments are also taking place in developing country scenario has led the authors to undertake this research. This paper discussed on findings from an exploratory research which seek to review the Malaysian economic and business environments in relation to the service revolution phenomena. Malaysian economic statistics pertainning to the service sectors are presented and discussed in relation to service-driven competition as normally seen in developed economies already experiencing service revolution. Managerial implications in terms of services as a source of competitive advantage is then discussed in the context of the current stage of service revolution in Malaysia.

THE MALAYSIAN ECONOMY AND SERVICE-DRIVEN COMPETITION
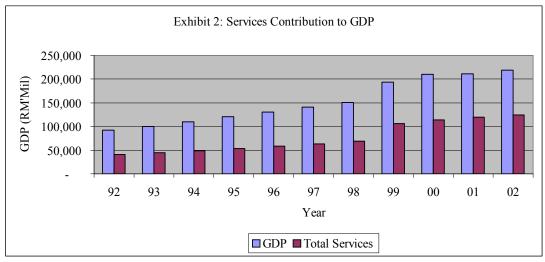
As service offerings increasingly being competed for value addition among businesses, the service sectors' accounts of countries' GDPs, in particular developed countries, expands accordingly. Other figures related to service sectors such as employment and growth rate will also increase. This is typical in developed country economy to the extent that the service revolution has led to the economy being dubbed as "Service Economy".

Exhibit 1 - Services Share of GDP & Employment in 2001 for Selected Countries

Data sources: OECD – National Accounts of OECD Countries, ADB Key Indicators 20
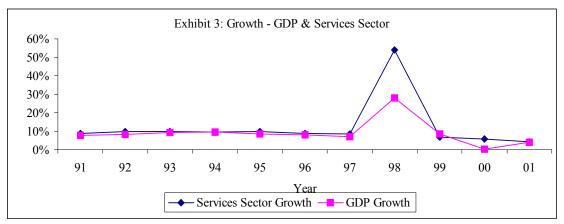
As shown in Exhibit 1, the service sectors contribution to GDP in 2001 for all developed countries included are above 60 percent. In the case of Malaysia, it is about 57%, which is higher than South Korea and Ireland. In term of total employment, the services sectors contributed about 50% for Malaysia in 2001 whereas for the other

countries included, the contribution is more than 60 percent. These economic realities could indicate that service revolution phenomena might have also started in the Malaysian fast developing economy. Service sectors' industries such as telecommunications, electricity, ICT services, banking and finance, education, hotel and tourism, and distribution and retailing, as well as manufacturing services are some of the major contributors.

Data sources: Economic Report from 1992 – 2004, Ministry of Finance Malaysia

In order to have better insights on such an economic phenomena development, a 10-year period of analysis (1992-2002) was conducted. For the period under study, services sector contribution to GDP grew from 43% to 57% as depicted in Exhibit 2. The growth trend had been quite consistent, which is a significant achievement to show that it is a single major contributor to the Malaysian economy. In term of growth rate, it can be seen clearly from Exhibit 3 that the services sector growth has consistently exceeded that of GDP growth during the period under study. In fact, the economic report for 2003/2004 produced by the Ministry of Finance Malaysia quoted that "the services sector growth has on average outpaced the GDP growth for more than a decade, reflecting the growing demand for services in line with the rapid expansion in other sectors of the economy". Even during post-meltdown period (i.e. post 1997), the rate of recovery for the services sector was faster than that of the GDP. This goes to show on the vibrancy and resiliency of the services sector relative to other sectors in the economy.
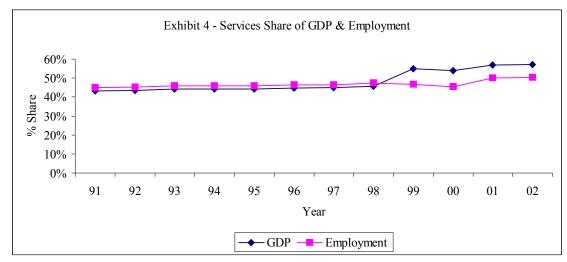
Note: The kink in the above chart was due to the revision of base prices used in the calculation process i.e. 1978 prices until 1998 and 1987 prices onwards
   Data sources: Economic Report from 1992 – 2004, Ministry of Finance Malaysia
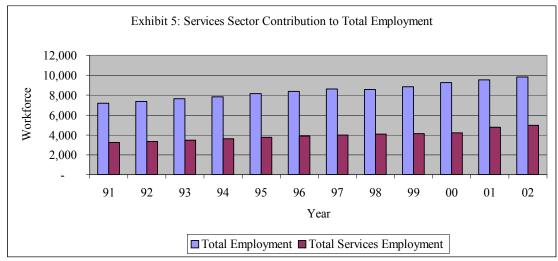
Looking at the percentage share of GDP and employment for services sector for the period under study, it can be seen from Exhibit 4 that services share of both GDP and employment have been on the upward trend, i.e. well above 40%, and started to increase further from 1999. This further reflects the significant of services sector roles toward the performance of the Malaysian economy.

Contribution to employment is perhaps among the key indicator in managing the economy. In this regard, the services sector contribution toward employment indicate a clear trend of upward growth as shown in Exhibit 5, averaging at around 4% year-on-year. For the period under study, the total employment by services sector have grown from 3.3 million to 4.9 million workforce, a respectable 48.5% increase over a period of 10 years.
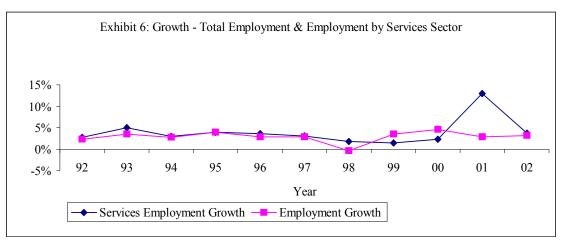
Exhibit 4 - Services Share of GDP & Employment

Data Sources: Economic Report from 1992 – 2004, Ministry of Finance Malaysia

Exhibit 5: Services Sector Contribution to Total Employment

Data Sources: Economic Report from 1992 – 2004, Ministry of Finance Malaysia

In term of trend in the services sector employment growth rate, the contribution proportion grew from 45% in 1992 to 50% in 2002. This is an important threshold as effectively, it means half of total employment in Malaysia is attributable to the workforce in the services sector. As such, the sector represents a major contributor and provider of job opportunities in Malaysia.

Exhibit 6 further enhances the above findings. Other than during the tough years in 1999 and 2000 due to the aftermath of global economic meltdown, the services sectors' growth have done consistently well, if not exceedingly well, than the overall total employment in Malaysia. On average, the services sectors were growing at 4% vis-à-vis the total employment of 3%. This further confirms that the services sector plays a pivotal role in generating job opportunities for the Malaysian population.

Data sources: Economic Report from 1992 – 2004, Ministry of Finance Malaysia

It could therefore be concluded that to some extent, the preceding analysis on Malaysian economy does indicate that service revolution is indeed about to begin. Recognizing the strategic importance of service sector industries toward the country's economic growth, the government is coming up with policies to ensure its developments and competitiveness at both the national and international levels.

Just as in the industrial revolution era, service revolution will spur new types of competitive environments. Businesses will have to face different kind of challenges that is normally referred to as service-driven competition. The major implication for Malaysian managers either in manufacturing or services sectors is to have sound knowledge on the nature of service-driven competition. And this starts with the understandings on services as a mission critical avenue for value creation in the service revolution era. The nature of service-driven competition and its managerial implications for both manufacturing and services sectors are explained in the following.

Services are to a large extent the result of co-operation or interactive relationships between representatives of the suppliers and the buyers (Gumesson, 1988), which in fact place the suppliers even more closely to their customers. Although the traditional marketing activities such as market research, sales promotion and personal selling are as important as ever, they are mainly used for establishing new customer relations and are of less importance when ongoing relations are to be maintained and strengthened to ensure patronage loyalty (Gronroos, 1988). And, in light of the ever-increasing level of competition, any value added service activity being offered can be of critical importance to the marketers in their pursuit of developing and cementing customer relations. In other words, service-driven competition means managers can no longer treat services as simply a separate agenda, but rather as part of the issue in their strategic mission and corporate planning process (Vandermerwe & Rada, 1988).

Service is largely driven by the customers (Vandermerwe and Rada, 1988) and competing in service has made manufacturers for example, move further down the distribution network, bypassing the middlemen, in their pursuit of actively searching opportunities of getting to know their customers' problems better and then provide services to create derived goodwill and demand. Just like in product-specific offerings, the key to competing in service-specific offerings is to find a way to add value better than the average competitors. IBM, for example, has been shifting its focus more towards software, networks, and communication linkages, which are all service related activities, as its basis for adding value and improving profits (Business Week, November 30, 1988).

Service-driven competition is now overwhelming especially in developed countries where services sector contribute upto 80% of their GDPs. An example from the industrial market is whereby Honda's operation in the US had to import their own JIT suppliers from Japan when US suppliers proved unwilling or unable to meet Honda's service and quality demands (Quinn *et al*, 1988). This decision was in line with Honda's objective of obtaining the response time it needs without escalating inventory costs. Another example is that of General Motors which had found that financial services is an indispensable competitive weapon and used it to offset competition by providing customers with difficult to match financing offers (service businesses accounted for 41% of GM's $2.9 billion earnings in 1986). If, before, service was often thought of as a 'luxury item' to be provided only in periods of prosperity, or something as add-on features (Wagner, 1987), today it has evolved into a critical component of a manufacturer's portfolio of strategies (i.e. being utilised as a competitive strategy).

Firms are getting more involved in service offerings to win against competition, while treating the usual marketing mix (such as price and product quality, or design) as pre-requisites to compete. Malaysian managers seasoned with manufacturing experiences will augur well by changing their attitude from just manufacturing to service mentality as well in order to be able to have a holistic view of their customers' business needs. They will also realise that product-specific offerings are just part of the mechanism for satisfying customers. The other part lies in the service dimension.

Service-driven competition is likely to have a profound impact on the nature of product marketing. Lele (1986) for example, mentioned three specific impacts as follows:

- It will create opportunities for innovative products that meet changing service support needs.
- It will increase competitive pressures to continually improve product reliability and serviceability.
- It will make 'conventional' service contracts an endangered species.

As Chase and Garvin (1989) pointed out in their article entitled, 'The Service Factory", "Competition is shifting away from how companies build their products to how well they serve customers before and after they build them". In other words, service revolution has also brought to service being viewed as a source of competitive advantage.

SERVICES AS A SOURCE OF COMPETITIVE ADVANTAGE

It is essential for Malaysian managers in particular, to realise that the service revolution era is characterised with service-driven competition, which led to service dimension being viewed as a source of competitive advantage. Once a firm recognised that customers wanted benefits and not just products, service became the major arena of value adding activity. Assuming that buyers choose the supplier who offers the greatest added value, then differentiation through product or price is increasingly difficult. This has further contributed to the strategic importance of service as a potential dimension for a differentiation strategy.

There is evidence to show how valuable service dimension is for manufacturing competitiveness. A study by the Forum Corporation (1990) for example, asked firms the reason they switched suppliers and 40 percent of them mentioned poor service as the reason. In another study conducted through workshops on four UK manufacturing firms, Voss (1992) found out that they all used service as a strategy to gain competitive advantage. Similarly, Donaldson and Domegan (1992), in their study on information technology and services among UK, French and Irish firms concluded that the leading edge firms view services as part of their corporate philosophy for gaining competitive advantage in the market place. Service is seen as having strategic implications on the way business is conducted and how it will be driven in the future among leading edge firms from the study.

A number of authors have discussed the ways or means by which service can be used as competitive tool. Vandermerwe and Rada (1988) for example, listed seven points in which service has strategic importance and can be used as a competitive tool. These are; (1) as barriers to competition, (2) as barriers to intermediaries, (3) as barriers to the customers themselves, (4) creating dependency, (5) differentiating market offerings, (6) diffusing new innovations and (7) for R & D and market research purposes.

Making a general statement about why firms are so deeply involved with value added service activities is not an easy task. Different viewpoints can be gathered with regard to service. Some viewed it as a natural progression of their businesses, others treated service as an obvious way to create opportunities, and still others used service as a differentiation strategy, or to extend their products' life cycle (Vandermerwe & Rada, 1988). However, it all boils down to the principle motive of gaining competitive edge, and service is seen as an instrument, which offers the biggest opportunities toward this end. In terms of sustaining the competitive edge, service also provide excellent opportunities simply because they are mostly implanted in the employees in the form of better qualifications, higher responsiveness and stronger customer orientation as examples. Therefore, unlike product elements (example better design or quality) as the basis of competition, employee elements of service in this case are not easily replicated by competitors, and can lead to sustainable competitive advantage, at least in the short run.

CONCLUSIONS

Analysis on relevant Malaysian economic statistics indicates that service revolution has indeed started. That means, as in the developed countries' service economies, service dimension of adding value has emerged as the new frontier of business competitiveness. The landscape of competition has also developed into another

dimension, and that of service-driven competition. Competition in this regard, is that of viewing services as a source of competitive advantage, be it for manufacturing or service businesses. Malaysian managers will now have to be attuned to the challenges of adding value through services just like their counterparts in developed countries.

In fact, a number of prominent figures in the Malaysian business scenes have actually advocated the notion that services sector will be the next engine of growth for the country. Among them are as follows;

- National Economic Action Council's (NEAC) executive director, Datuk Mustapa Mohamed, indicated that the government will stimulate the services sector, which is viewed as a growing sector that can be further developed to boost the country's economy (Business Times, Tuesday June 11, 2002, p B5).
- "There is a need for a fresh look at how Malaysia can be positioned for further growth in the services sector", Kuala Lumpur Business Club's president, Datuk Dr Mohd Munir Abdul Majid said referring to the emerging potential of Business Process Outsourcing services sector for Malaysia (New Strait Times-Business Times, 22nd December, 2003, pg B2)
- "No, I have always liked services and that's why Symphony is a service organization. I think that's the next growth area", explained Datuk Azman Yahya, CEO of Symphony House Berhad, when asked in an interview on whether he is on the lookout for other business areas (New Strait Times-Business Times, 27th January, 2004, pg B4)
- "The Malaysian economic thrust during the time of Tun Dr Mahathir Mohamad was mainly focussed on infrastructure development which will be difficult to repeat in the next 10 years. Now is the time for Malaysia to utilise that infrastructure using the software approach," American-Malaysian Chamber of Commerce (Amcham) governor and past president, Datuk Nicholas S. Zeffreys said in an interview referring to services sector being the "soft approach" (The Star-Star Biz, 16th February, 2004, pg 4).
- "It is time for Malaysia to shift and tweak its investment strategy and try to unlock the hidden investment opportunity of the services sector," said Citibank Bhd's CEO, Piyush Gupta, who is also Amcham board member (The Star-Star Biz, 16th February, 2004, pg 4).

REFERENCES:

Chase, R.B., and Garvin, D.A. (1989), "The Service Factory", Harvard Business Review, July-August, pp. 61-69.

Davis, F.W. and Manrodt, K.B. (1991), "Service Logistics: An Introduction", International Journal of Physical Distribution & Logistics Management, Vol. 21 No. 7, pp. 4-13.

Department of Statistics Malaysia (1994), "Census of Selected Service Industries 1994"

Department of Statistics Malaysia (2000), "Malaysia Standard Industrial Classification 2000"

Department of Statistics Malaysia (2002), "Economic Census 2001 - Selected Services"

Department of Statistics Malaysia (2002), "Economic Census 2001 – Transport and Communications"

Department of Statistics Malaysia (2002), "Economic Census 2001 – Information and Communication Technology"

Donaldson, B. and Domegan, C. (1992), "Customer Service and Information Technology", Working paper series, University of Strathclyde, Department of Marketing.

Forum Corporation (1990), "Customer Focus Research", executive briefing quoted in Chase, R. et al, "Service Based Manufacturing-the Service Factory", research paper DS-90 39, University of Southern California.

Gronroos, C. (1988), "New Competition in the Service Economy: The Five Rules of Service", International Journal of Operations & Production Management, Vol. 8 No. 3, pp. 9-19.

Lele, M. (1986), "How service needs influence Product Policy", Sloan Management Review, Vol. 28 (1), pp. 63-70.

Ministry of Finance Malaysia (1997), "Economic Report 1997 / 1998", Vol. 26

Ministry of Finance Malaysia (2002), "Economic Report 2002 / 2003", Vol. 31

Ministry of Finance Malaysia (2003), "Economic Report 2003 / 2004", Vol. 32

Quinn, J.B., Baruch, J.J. and Paquette, P.C. (1988), "Exploiting the Manufacturing-Services Interface", Sloan Management Review, Summer, pp. 45-56.

Singh, M.P. (1990), "Service as a Marketing Strategy: A case Study at Reliance Electric", Industrial Marketing Management, Vol. 19, pp. 193-200.

Vandermerwe, S. and Rada, J. (1988), "Servitization of Business: Adding Value by Adding Services", European Management Journal, Vol. 6 No. 4, pp. 314-24.

Voss, C. (1992), "Applying Service Concepts in Manufacturing", International Journal of Operations & Production Management, Vol. 12 Iss. 4, pp. 93-99.

Wagner, W.B. (1987), "Customer Service in Industrial Marketing: Hedge Against Competition", European Journal of Marketing, Vol. 21 No. 7, pp. 7-17.

Service Quality Dimensions: A Study on Various Sizes of Grocery Retailers – A conceptual Paper

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ABSTRACT

The slow growth of grocery products in Malaysia since the Asian financial crisis and the influx of multinational and large scale retailers since early 1990s allow Malaysian consumers to be more selective of their choice of grocery stores. Smaller grocery stores in Malaysia are seen as offering more personal services but with inadequate stocks and facilities; a contrast to the larger retailers which are seen as offering better merchandise choice and public amenities but with standardized and non-personalized services.As grocery retailers are seen as offering similar products in the store, improving service quality is seen as critical to ensure customer loyalty. Despite the extensive research on the measures used by consumers to measure service quality in the service sector, there is lack of empirical studies on it in the retail sector. A need to look into service quality dimensions for each country is called for, as each country is believed to have its own unique set of quality dimensions. This conceptual paper identifies the service quality dimensions critical to urban grocery shoppers for small, medium, and large-sized grocery stores. It will identify the critical quality dimension of Malaysia urban grocery shoppers based on the Retail Service Quality Scale by Dabholkar *et al.*, (1996) that takes into account the retail setting. The instrument will be modified based on literature review.

INTRODUCTION

Unlike the food retail scenario in the West, where the traditional food retailers disappeared with the entrance of more modern food retail establishments (Osman M. Zain & Ismail Rejab, 1989), the traditional grocery stores in Malaysia are expected to be in existence for quite sometime as the shift of grocery shopping to modern stores in Malaysia is expected to be slow (Sabry Tahir, 2003). The traditional store outlets and provision shops capture high percentage of groceries purchased (57%), while the modern trade outlets, which includes hypermarkets and supermarkets stood at only 31% (Izwan Idris, 2002). Another report by the research firm Taylor Nelson Sofres shows that hypermarkets gained only 12% of total household spending on packaged food, toiletries, and household goods in West Malaysia (Prystay, 2002). This situation has been observed earlier in the local retail scene with the entrance of the more modern supermarkets into the retail scene in the 1980s (Osman M. Zain & Ismail Rejab, 1989). They observed that both modern supermarkets and smaller traditional outlets coexist within a growing retail sector of the economy.

Since the study by Osman M. Zain & Ismail Rejab (1989) there has been a large influx of large scale multinational retailers (Rosmimah Mohd. Roslin, 2000). The number of hypermarkets increases tremendously from only 1 in 1995 to 21 in 2002 (Prystay, 2002) and to 30 in 2003 (Moreira, 2003). The growing number of the larger grocery retailers has been a concern of the Ministry of Domestic Trade and Consumer Affairs (MDTCA) who felt that hypermarkets are affecting local retailers as they operate on low margins in a slow growing grocery market. The slow growth of grocery products in Malaysia happened since the Asian crisis. In 2001, the growth of grocery products is only 3% (Euromonitor, 2002). In addition, hypermarkets like Tesco, Carrefour, and Giant are creating price war as they continuously cut down prices on daily use essentials including grocery products (Moreira, 2003).

In an effort claimed by MDTCA to protect small retailers, Guidelines for the Establishment of Hypermarkets were issued (Moreira, 2003). The retail industry has witnessed the high rate (38%) of traditional provision stores closure from 46,544 in 1992 to 28,659 in 2001 (Prystay, 2002). Another observable result is the closure of 16 Tops supermarkets in 2000 and another 6 at the end of 2002 (Ganesan, 2003a). Furthermore, the sales revenue of Ocean supermarkets in Klang Valley in 2002 reduces by 38% from the previous year due to competition from hypermarkets (Moreira, 2003).

Facing price competition and slow growth of the food retail, small retailers have been suggested to improve their business strategies and use different retail approach as not to depend on government's protection for a long time (Moreira, 2003). Due to the price war among hypermarkets, grocery retailers should not depend on price for competitive advantage.

PROBLEM STATEMENT

Smaller grocery stores in Malaysia are seen as offering more personal services (Osman M. Zain & Ismail Rejab, 1988) but with inadequate stocks and facilities (Moreira, 2003); a contrast to the larger retailers which are seen as offering better merchandise choice and public amenities (Moreira, 2003) but with standardized and non-personalized services (Osman M. Zain & Ismail Rejab, 1988). As competition is higher in the urban area especially in Klang Valley where the number of hypermarket is the highest (Izwan Idris, 2002), grocery stores should be looking for strategic options to increase patronage. Indeed, retaining current customers leads to a gradual increment in the retailer's customer base and profits gained from the customers grow with the loyalty of the customers (Sirohi *et al.*, 1998).

Service quality has been seen as critical for service firms to position themselves strongly in a competitive environment (Parasuraman, *et al.*, 1985, Shemwell *et al.*, 1998; Mehta *et al.*, 2000) and also as indicators of business performance (Hurley & Estelami, 1998). When faced with larger, powerful retail competitor, smaller stores could compete by improving service instead of competing on price (Klemz & Boshoff, 1999). Concentrating on service quality is seen as critical in markets that offer similar products in the store (Berry, 1995), commonly seen in grocery retail stores. However, improvement of the quality of services requires identification of the service quality attributes - the so-called dimensions- that are important to retail customers.

Despite the extensive research into the dimensions used by consumers to measure service quality in the service sector, there is lack of empirical studies on factors of quality improvement strategies (Odekerken-Schröder *et al.*, 2001), especially the service quality dimensions (Dabholkar *et al.*, 1996) for the retail sector. The most famous and well discussed service quality model in the 1990s (Robinson, 1999) –SERVQUAL - by Parasuraman *et al*, (1985) failed to be fully adopted and validated in a retail setting (Dabholkar *et al.*, 1996, 1996). Service quality measurement of the retail stores, unlike the pure service setups, should include the measure of service quality and product quality as retail stores offer a mix of services and products (Mehta *et al.*, 2000; Dabholkar *et al.*, 1996).

Finally, a need to look into quality dimensions for each country is called for, as each country is believed to have its own unique set of quality dimensions (Xiande Zhao *et al.*, 2002) with different levels of importance (Feinburg and de Ruyter, 1995). Consumers' attitudes towards food shopping are associated with culture (Samsinar *et al.*, 2001) and therefore, any findings from previous studies in other countries may be irrelevant in Malaysia. Currently there is lack of research on service quality of retail stores in Malaysia specifically consumers' service quality perceptions of the different sizes of stores. Several researches have concentrated on service quality of businesses namely courier companies (Norbani Che Ha & Sharmila Sinnathurai, (1999), automotive industry (Tan, 1998), and financial institution (Ndubisi, 2003) and service quality of government department (Sharifuddin Zainuddin, 1997). There is also a gap in the literature on the measure of service quality among competing retailers (Dabholkar *et al.*, 1996) in particular of different sizes. Hence, this research will identify the critical service quality dimensions of different grocery store sizes from the perspectives of the urban grocery shoppers in Malaysia.

LITERATURE REVIEW

SERVICE QUALITY

Ghobadian et al. (1994) posit that most of the service quality definitions fall within the "customer led" category. Juran (1999) elaborates the definition of customer led quality as "features of products which meet customers' needs and thereby provide customer satisfaction." As service quality relates to meeting customers' needs, we will be looking at "perceived service quality" in order to understand consumers (Arnauld *et al.*, 2002). Grönroos (1984) and Parasuraman *et al.*, (1985) looks at perceived quality of service as the difference between customers' expectation and their perceptions of the actual service received.

Other researchers look at perceived service quality as an attitude. Arnauld *et al.*, (2002) defined perceived quality "whether in reference to a product or service" as "the consumers' evaluative judgment about an entity's overall excellence or superiority in providing desired benefits" (p. 327). Hoffman & Bateson (2001) defines service quality as an attitude "formed by a long-term, overall evaluation of a performance". Attitude is defined as "a consumer's overall, enduring evaluation of a concept or object, such as a person, a brand, or a service." (Arnauld *et al*, 2002) Service quality as "an attitude" is consistent with the views of Parasuraman *et al.*, (1988), Cronin & Taylor (1992) & Sureshchandar *et al.*, (2002). Basis of the view is elaborated by the latter:

> "As perceived service quality portrays a general, overall appraisal of service i.e. a global value
> judgment on the superiority of the overall service, it is viewed as similar to attitude." (p. 364)

Feinburg & de Ruyter (1995) pointed the importance of adapting the definition of service quality in different cultures. Ueltschy & Krampf (2001) contended that differences in culture affect measure of quality in a service sector. They encapsulated service quality measures as "culturally sensitive" and "may not perform properly or comparatively in a culturally diverse group domestically or abroad" (p.22). Cultural factors are said to have greater influence on people's evaluation of services than on their evaluations of physical goods due to involvement of customer contact and interaction with employees while a service is delivered (Mattila, 1999). Feinburg & de Ruyter (1995) postulated that the differences "require adapting service quality to an international setting" (p. 4). Furthermore, the service quality dimensions that are critical most to consumers vary according to culture and industry (Winsted, 1999). Hence, there is a need to find the service quality measurement for grocery retail industry in Malaysia.

SERVICE QUALITY MEASUREMENT

It is difficult to measure service quality as compared to good's quality. The difficulty to measure is due to fewer tangible cues available when consumers purchase services (Parasuraman *et al*., 1985), fewer search properties, but higher in experience and credence properties (Zeithaml, 1981 in Parasuraman 1985), as compared to goods. It also requires higher consumer involvement in the consumption process (Grönroos, 1984).

Researchers operationalize the service quality construct either as a gap between expectation of service and perceived performance of service, or just perceived performance alone (Hurley and Estalami, 1998). On the other hand, service quality dimensions are seen as the criteria to assess service quality (Parasuraman, Zeithaml, and Berry, 1985). Feinburg, and de Ruyter (1995) supported this idea as they postulate that the dimensions are instruments for measuring perceived service quality. They also posit that consumer-perceived service quality is usually seen as a multi-dimensional construct.

The earliest research on service quality dimensions was done by Grönroos (1984). He found that the perceived quality of a service is affected by the experience that the consumer went through for a service. Therefore, he encapsulated the perceived quality of a given service as the outcome of an evaluation process; a comparison between the consumer expectations of the service with his perceptions of the service he has received. He also pointed that expectation is influence by traditions, ideology, word-of-mouth communication, and previous experience with the service and the consumer's perception of the service itself determines his perceived service. However, he did not discuss the relationship between perception and expectation and how it influences service quality.

Grönroos (1984) found that "service quality" comprises of three global dimensions. The first dimension is the technical quality. This dimension refers to the outcome or what is delivered or what the customer gets from the service. For a retail store, technical quality may include the range of products offered and the availability of parking space. The next dimension is the functional quality which refers to the manner in which the service is delivered or how it is delivered. Customers of a retail store will measure whether the salespeople are friendly or whether products are easily returnable. Finally, the last dimension is the corporate image. The store's image is built by mainly both technical and functional quality and to some extent other factors like the traditional marketing activities.

The most popular service quality model in the 1990s (Robinson, 1999) is the model by Parasuraman *et al*., (1985). Their model supported Grönroos' findings on as the models are based on these three underlying themes:

> "1) Service quality is more difficult for the consumer to evaluate than goods quality; 2) Service quality perceptions result from a comparison of consumer expectations with actual service performance; 3) Quality expectations are not made solely on the outcome of the service; they also involve evaluations of the process of the service" (Parasuraman *et al.*,1985, p. 42)

Unlike Grönroos (1984) who used global measure of service quality, Parasuraman *et al.* (1985) identified 97 items or criteria in measuring service quality. They argued that consumers used similar criteria irrespective of the type of service in measuring service quality. They then group these criteria into 10 key categories which they labeled as "service quality determinants" (p. 48). The determinants are reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing the customer, and tangibles. Later in another research (Parasuraman *et al.*, 1988), they refined the dimensions as shown in Table 1 into only five dimensions - tangibles, reliability, responsiveness, assurance, and empathy

Table 1: SERVQUAL's Five Dimensions

Dimensions	Definitions
Tangibles	The appearance of physical facilities, equipment, appearance of personnel, and communication materials
Reliability	The ability to perform the promised service dependably and accurately
Responsiveness	The willingness to help customers and provide prompt service
Assurance	The knowledge and courtesy of employees and their ability to inspire trust and confidence
Empathy	The caring, individualized attention the firm provides to its customers

Source: Parasuraman, Zeithaml & Berry, 1988, p. 23. and Parasuraman, Berry, and Zeithaml, 1991, p. 41.

Due to the failure of SERVQUAL to be fully adapted and validated in a retail store setting that offers a mixture of services and merchandise, Dabholkar *et a.l* (1996) developed the Retail Service Quality Scale (RSQS). Taking into account retailing-related dimensions retailing existing literature, the researchers adopted 17 items from SERVQUAL and added 11 new items based on their research. The scale that has high construct reliability and validity in measuring service quality in department stores include:

1. Physical aspects – Retail store appearance and store layout.
2. Reliability – Retailers keep to their promises and do the right things.
3. Personal interaction – Store personnel are courteous, helpful, and inspire confidence in customers
4. Problem solving – Store personnel are capable to handle returns and exchanges, customers' problems and
   complaints.
5. Policy – Store's policy on merchandise quality, parking, operation hours, and credit cards

SERVICE QUALITY DIMENSIONS

Physical Aspects

Service is said to be distinguished from goods due to its intangibility (Santos, 2002). The tangibility aspects of a service have a significant effect on perceived service quality (Santos, 2002). The tangibility importance varies according to types of service (Santos, 2002). For a retail store, the tangibility aspect will be critical as the retailers offer a mix of merchandise and service quality (Dabholkar *et al.*, 1996). Specifically, the physical environment plays an important role in the service encounter of the grocery industry (Keillor, *et al.*, 2004).

The importance of physical environment in a service setting is due to its ability to influence consumer attitudes (Koernig, 2003), behaviour intention (Keillor, *et al.,* 2004) and behaviour (Bitner, 1992; Koernig, 2003). As customers are involved in the production and consumption process of a service conducted within a physical environment, the physical environment will have a deep impact on customers' perception of service experiences (Bitner, 1992). Bitner (1992) also noted that physical environment is often used as cues of a firm's competences and quality by consumers before a purchase. Specifically, proper layout in a store will reduce shopper's search time (Sirohi *et al.*, 1998), colour combine with lighting were suggested to "affect consumers' cognitive representation and affective reaction" (Babin *et al.*, 2003, p. 549), and a light and pleasing scent affects shoppers' perceptions of a shopping environment in which the latter will have a significant effect on shoppers' mood (Chebat & Michon, 2003).

Researchers have given several names with different interpretations to the "physical" elements of service quality measure. Dabholkar *et al.* (1996) used the term "physical aspects" to refer to the physical appearance of store and layout convenience. Parasuraman *et al.* (1988) called it as "tangibles" adding appearances of staff besides physical facilities and equipment. Baker (1986) and Santos (2002) acknowledged the appearance of staff as part of tangibles. They also added existence of other customers in the service facility onto the interpretation. Bitner (1992) dropped the social environment as listed by Baker (1986), Parasuraman *et al.* (1988), and Santos (2002) but focus instead on the "built environment" or what she called as "servicescape". She categorized the servicescape to include ambient conditions, spatial layout and functionality, and signs, symbols, and artifacts. Ambient conditions include colour, music, temperature, lighting, and scent. Spatial layout refers to the arrangement, size, shape, and spatial relationships of machinery, equipment, and furnishings. Functionality refers to the capability of machinery, equipment, and furnishings to enhance performance and achieve customer goals. Lastly, signs, symbols, and artifacts act as signals that communicate information about the service place to customers.

Reliability

The reliability dimension comprise of "promises" and "doing it right" subdimensions (Dabholkar *et al.*, 1996). Besides fulfilling promise and performing the right service as part of reliability, the researchers added the availability of merchandise as part of the "doing it right" subdimension. According to a survey by PricewaterhouseCoopers, consumers in Asia demand superb quality, especially the availability of merchandise in stores, much more than the Western customers (Maisara Ismail, 2002).

Inter-personal relationship

The interaction among store personnel and store customers are important as customers are more loyal to a store if the store is seen as warm, friendly, and impulsive. (Bellenger *et al*, 1976) Several researchers has studied this dimension in different or across cultures and found that the interpretation of the dimension and importance of each item in the dimension is affected by the culture of the society studied (Feinburg & de Ruyter, 1995; Winsted, 1999; Imrie *et al*., 2002).

Dabholkar *et al.* (1996), put forward that the personal interaction has two subdimensions namely inspiring confidence of customers by store personnel and courteousness/helpfulness of store personnel. Inspiring confidence of customers includes error-free sales transactions and record, the ability to answer customers' questions, the behaviour of employees in this store instill confidence in customers, and customers feel safe in their transactions with this store. Incorporated in the courteousness/helpfulness factor are employees are prompt service to customers, employees tell customers exactly when services will be performed, customers are given individual attention, employees are consistently courteous with customers, and employees treat customers courteously on the telephone. Darian *et al*. (2001) also pointed on the importance of sales personnel's knowledge who is aware of new products, technical developments, prices, and other variations of store offerings, who is responsive but provides only information required, and who is not talking down to a customer.

However, Imrie *et al*. (2002) found that researches utilizing Western samples did not discover the factors "sincerity", "generosity", and "courtesy/politeness" which he found to be critical to Taiwanese consumers. The interpretation of politeness by Imrie (2002) is similar to the interpretation of "formality" by Winsted (1999). She found that "formality is a critical service quality factor to Japanese customers. Odekerken-Schröder *et al.* (2001) in their research emphasized the importance of inter-personal relationship which refers to "the opportunity for customers to affiliate with other individuals during the retail encounter" (Odekerken-Schröder *et al.*, 2001, p. 310). They elaborated the interaction as both the customer-to-customer and customer-to-service provider social interaction. Previously, Harris *et al*. (1995) proved in their study that 48% customers of a retail store interacted orally with the service personnel while nearly 12% of the customers interact orally with other customers.

Feinburg & de Ruyter (1995) in their cross culture study of service quality conceptions of retail consumers in United States, Netherlands, and Taiwan found that although there are similarities of how consumers in one country define service quality, there are significant differences discovered in the importance placed on each dimension. The similarities discovered were the inclusion of friendly and knowledgeable salespeople in the definition of all groups. They also found that Taiwanese rate highly on the dimensions of polite/friendly sales people and respectful treatment received in the store, Americans rate highly on merchandise related dimensions, while Dutch consumers rate highly on personalized service and knowledgeable sales people.

Problem Solving

Dabholkar *et al.* (1996) proposed a new dimension "problem solving" which was not addressed in SERVQUAL. This dimension incorporated store's willingness to handle returns and exchanges, shows a sincere interest in solving customers' problems, and also store personnel's ability to handle customer complaints directly and immediately. They highlighted the need to have problem solving as a dimension by itself because of the importance of "service recovery" in providing good service.

Policy

Store policy influences various aspects of service quality (Dabholkar *et a.l*, 1996). They elaborated store policy to include high quality merchandise, parking facilities, convenient operating hours, acceptance of major credit cards, and store's own credit card.

Mehta *et al*. (2000) seemed in agreement with Dabholkar *et al.* (1996) that the service quality measurement of the retail stores should include the measure of service quality and product quality as retail stores offer a mix of services and products. This view is shared by Brady & Cronin (2001), who stated that evaluation of quality of service should include evaluation on the performance of the physical goods offered to customers.

STORE SIZE

Store size is used as a critical basis of grocery stores categorization due to shoppers' preference to "form simple perceptual categories of grocery stores" (Uusitalo, 2001, p. 220). The researcher discovered that when grocery shoppers were spontaneously asked to describe the grocery stores they patron, they would first mentioned the size of the stores. Categorizing of grocery stores according to store type or store format is seen as ambiguous and complex by consumers (Uusitalo, 2001). As a result store, type or store format, as a basis of grocery stores categorization, was also linked to store size (Uusitalo, 2001).

Furthermore, consumers will use expectations of a store category (store size in this case) to guide their perception and evaluation of a particular store or a store choice (Uusitalo, 2001). Due to the importance of store size to in consumers' perception of grocery stores, this thesis will use store size as a basis of categorization for consumers' evaluation of a store's service quality. The definition and characteristics of a store size will be derived from literature on the topic.

Several researchers (Lim *et al*., 2003; Nik Rahimah *et al*., 1992) have categorized the size of the retail stores in Malaysia into only small-scale and large-scale retail establishments. However, Sieh (1974) and Lang (1985) had earlier proposed 3 sizes of retail establishments based on annual sales turnover. Sieh (1974) stated that a small store has less than RM 20,000 annual sales, a medium store has between RM20,000 to RM 100,000 annual sales, and a large store has more than RM 100,000 annual sales. Based on her definition, 69% of the 46,823 food stores in Malaysia in 1968 were the small stores, 25.5 % were the medium stores, while 5.5 % were large stores. Almost ten years later, Lang (1985) divided the store sizes according to higher level of annual sales turnover. This time, the definitions were as follows: small stores have annual sales turnover of less than RM 100,000, medium stores have annual sales turnover of between RM 100,000 to less than RM 500,000, while large stores have annual sales turnover of more than RM 500,000.

As consumers will be asked to determine the service quality dimensions for a specific store size, it will be difficult for them to visualize the store size according to sales figures (based on the definition by Sieh (1974). Furthermore, it is found that categorizing of grocery stores according to store type or store format is seen as ambiguous and complex by consumers (Uusitalo, 2001). As a result store, type or store format, as a basis of grocery stores categorization, was also linked to store size (Uusitalo, 2001). This study will also takes into account the definition of smaller grocery stores by Rosmimah & Noraini (2002) that categorize the smaller stores according to shop lot and the study by Khalifah Othman (1987) where the supermarket (a medium sized store) has centralized checkout counters. Therefore, the categorization of store size in this study will be on the floor size or the number of shop lot and the check out counter which will be easily identified by consumers.

SERVICE QUALITY AND STORE SIZE

Different sizes of firms were said to have several critical differences (Youssef *et al*., 2002) The researchers posited that the flat structure of small to medium sized firms leads to a more flexible work environment where managers or owners will tend to interact directly with customers, tend to be 'people oriented' instead of 'system oriented', and tend to be more flexible. Large firms are typically highly structured with formalized procedure set for all activities with high emphasize on standardization and specialization (Youssef *et al*., 2002). The effects of the structure in relations to the size of the firms are reflected in the retail sector.

The survival of the smaller, traditional food store in a competitive environment is attributable to the nature of the service structure. Smaller stores allows customers to purchase most goods at smaller amount, and promotes strong bond between shop owners and their customers (Osman M. Zain & Ismail Rejab, 1989) Odekerken-Schröder *et al.* (2001) elaborated that small, independent neighbourhood stores gives out more personal service, extra attention, and customized advice against the more anonymous, standard self-service that is offered in larger store chains. In another research, small grocery stores are perceived to provide personal contacts, personal attention and care, personal customer service, personal conversations and interpersonal relations, and convenience of being near and allow for quick and easy shopping (Uusitalo, 2001).

However, smaller stores have been viewed negatively as having crammed spaces, expensive products, product run outs, and narrow product range (Uusitalo, 2001). Malaysian consumers faced inconveniences like

'insufficient parking facilities, inadequate stocks, price discrimination, excessive profiteering, getting short-changed in weight of products sold, and unsatisfactory service" before the existence of hypermarkets (Moreira, 2003, p. 37)

On the other hand, the medium-sized grocery stores or the more modern supermarkets, capture the sales of food items due to shopping comfort and parking facilities (both related to service quality) although the prices of the similar items maybe relatively higher than smaller stores (Osman M. Zain & Ismail Rejab, 1989). A study on the service quality of supermarket in Singapore found that "personal interaction" and "physical aspects' were the only two important determinants in the respondent's evaluation of the service quality of a supermarket (Mehta *et al,* 2000).The other dimensions namely "Policy", "Problem solving" and "Reliability" were found not to be important in the measure of service quality for a supermarket (Mehta *et al,* 2000).

The existence of large format retailers is said to cause losses of the level of service to a community due to closure of the traditional stores (Arnold and Luthra, 2000). The larger store chains are seen as giving more anonymous and standard self-service (Odekerken-Schröder *et al.*, 2001). Size of a physical environment has been seen as a factor influencing the extent of social interaction between and among customers and employees (Forgas, 1979). The size of the larger store itself would prevent the store from focusing on "process and social aspects of retail encounters" (Odekerken-Schröder *et al.*, 2001, p. 312). Larger stores were perceived as requiring time and effort due to extensive walking and searching (Klemz & Boshoff, 2001).

Nevertheless, hypermarkets which are larger, tends to offer lower prices, provides more efficient climatically-controlled shopping area, and more consistency in its service offering as compared to supermarkets (Arnold and Luthra, 2000). Large store chains emphasize and compete on the basis of a wide and deep mix of merchandise (Klemz & Boshoff, 2001; Odekerken-Schröder *et al*, 2001). Larger grocery stores provide convenience as large amounts of goods can be purchased during one shopping trip and can easily be transported by car (Klemz & Boshoff, 2001). This convenience is supported by increased mobility as consumers have more choices of where to shop and how much to shop (Clarke, 2000). Hypermarkets are claimed to be popular in Malaysia as they provide one-roof shopping convenience, reasonable prices, air conditioning and ample parking (Moreira, 2003).

DISCUSSION AND RECOMMENDATION

RSQS has been replicated in several studies outside United States. A study by Boshoff & Terblanche (1997) on hypermarket shoppers in South Africa proves the validity and reliability of the instrument in a different environment. However, replication of the scale in Hong Kong (Siu & Cheung, 2001), reveals its applicability with modification. The researchers did a survey on customers of a multi-national department store chain. They dropped three items from the scale because of the inappropriateness in terms of meaning in the study. First, the customers in Hong Kong seldom interact with store employees over the phone as they visit the store directly. Second, the chain store did not provide parking spaces for customers. Also, the store did not offer its own credit card in Hong Kong. The emerging dimensions in the study were personal interaction, policy, physical appearance, promises, problem solving, and convenience.

In another study using the scale in Singapore, Mehta *et al.* (2000) made two modifications. Firstly, the item " _____ accepts most credit cards" (policy dimension) was deemed inappropriate as the supermarket in Singapore do not normally accept credit cards and was changed to "_____ accepts cheques without hassle". Secondly, the item "_____ offers its own credit card" (policy dimension) was also changed to "____ offers a wide variety of merchandise" as very few retail stores in Singapore offers its own credit cards.

Table 2 highlight the dimensions, the relevant subdimensions, and perception items based on literature review and replication of the scale in other countries. However, the personal interaction in RSQS will be changed to "inter-personal relationship" taking into account findings in the literature review.

Table 2: Service Quality Instrument

RSQS Dimension	RSQS Subdimension	Perception item
Physical aspects	Appearance	P1: This store has modern-looking equipment and fixtures
Physical aspects	Appearance	P2: The physical facilities at this store are visually appealing
Physical aspects	Appearance	P3: Materials associated with this store's service (such as shopping bags, catalogs, or statements) are visually appealing
Physical aspects	Appearance	P4: This store has clean, attractive, and convenient public areas (restrooms, fitting rooms)

Physical aspects	Convenience	P5: The store layout at this store makes it easy for customers to find what they need
Physical aspects	Convenience	P6: The store layout at this store makes it easy for customers to move around in the store
Reliability	Promises	P7: When this store promises to do something by a certain time, it will do so
Reliability	Promises	P8: This store provides its services at the time it promises to do so
Reliability	Doing it right	P9: This store performs the service right the first time
Reliability	Doing it right	P10: This store has merchandise available when the customers want it
Reliability	Doing it right	P11: This store insists on error-free sales transactions and record
Inter-personal relationship	Inspiring confidence	P12: Employee in this store have the knowledge to answer customers' questions
Inter-personal relationship	Inspiring confidence	P13: The behaviour of employees in this store instill confidence in customers
Inter-personal relationship	Inspiring confidence	P14: Customers feel safe in their transactions with this store
Inter-personal relationship	Courteousness/helpfulness	P15: Employees in this store give prompt service to customers
Inter-personal relationship	Courteousness/helpfulness	P16: Employees in this store are never to busy to respond to customer's requests
Inter-personal relationship	Courteousness/helpfulness	P17: This store gives customers individual attention
Inter-personal relationship	Courteousness/helpfulness	P18: Employees in this store are consistently courteous with customers
Inter-personal relationship	Courteousness/helpfulness	P19: Employees in this store are use appropriate form of address with customers
Inter-personal relationship	Courteousness/helpfulness	P20: Employees in this store is willing and enthusiastic to respond to customer's request
Inter-personal relationship	Interaction	P21: This store provides conducive environment for chatting with other shoppers or store personnel
Inter-personal relationship	Interaction	P22: This store provides conducive environment for social contact with other shoppers or store personnel
Inter-personal relationship	Interaction	P23: This store provides conducive environment for friendship with other shoppers or store personnel
Problem solving	None	P24: When a customer has a problem, this store shows a sincere interest in solving it
Problem solving	None	P25: Employees of this store are able to handle customer complaints directly and immediately
Policy	None	P26: This store offers high quality merchandise
Policy	None	P27: This store provides plenty of convenient parking for customers
Policy	None	P28: This store has operating hours convenient to all their customers
Policy	None	P29: This store accepts most major credit cards
Policy	None	P30: This store willingly handles returns and exchanges

Figure 1 illustrate that store size will be the moderating variable in the relationship between the dimensions and the overall service quality perceptions measure. Based on the literature review, it is expected that the inter-personal relationship and problem solving dimensions will contribute significantly to the overall service quality measure of a small-sized grocery store, the physical aspects and inter-personal relationship dimensions contribute significantly to the overall service quality measure of a medium-sized grocery store, and the physical aspects, reliability, and policy dimensions will contribute significantly to the overall service quality measure of a large-sized grocery retailer.

Figure 1: Proposed Conceptual Framework

REFERENCES

Arnauld, E. J., Price, L.L., Zinkhan, G. M. (2002), *Consumers*, New York, NY: Mc-Graw-Hill Higher Education.

Arnold, S. J. & Luthra, M. N. (2000), Market entry effects of large format retailers: a stakeholder analysis, *International Journal of Retail and Distribution Management, 28* (4/5), 139-154.

Babin, B. J., Hardesty, D. M., and Suter, T. A. (2003). Color and shopping intentions: the intervening effect of price fairness and perceived effect. *Journal of Business Research, 56*, 541-551.

Baker, J. (1986) in Koernig, S. K. (2003), E-Scapes: The electronic physical environment and service tangibility. *Psychology & Marketing, 20* (2), February, 151-167.

Bellenger, D. N., Steinberg, E., and Stanton, W. W. (1976), The congruence of store image and self image. *Journal of Retailing, 52* (1), Spring, 17-32.

Berry, L. L. (1986). Retail businesses are services businesses. *Journal of Retailing, 62* (1), Spring, 3-6.

Bitner, M. J. (1992), Servicescapes: The impact of physical surroundings on customers and employees. *Journal of Marketing, 56*, April), 57-71.

Boshoff, C., & Terblanche, N. S. (1997). Measuring retail service quality: a replication study. *South African Journal of Business Management, 28*, (4), Dec., 123 – 128.

Brady, M. K., and Cronin Jr., J.J. (2001a). Customer orientation: effects on customer service perceptions and outcome behaviours. Journal of Service Research, 3 (3), February, 241-251.

Chebat, J-C, and Michon, R. (2003) Impact of ambient odors on mall shoppers' emotions, cognition, and spending: a test of competitive causal theories. *Journal of Business Research, 56*, pp. 529-539.

Clarke, I. (2000). Retail power, competition, and local consumer choice in the UK grocery sector. *European Journal of Marketing, 34* (8), 975-1002.

Cronin, J., and Taylor, S. (1992). Measuring service quality: a reexamination and extension. *Journal of Marketing, 56*, July, 55 – 68.

Dabholkar, P. A., Thorpe, D. I., and Rentz, J.O. (1996). A measure of service quality for retail stores: scale development and validation. *Journal of the Academy of Marketing Science, 24* (1), 3-16.

Darian, J. C., Tucci, L. A., Wilman, A. R. (2001). Perceived salesperson service attributes and retail patronage intentions. *International Journal of Retail & Distribution Management, 29* (5), 205-213.

Euromonitor, Retail Trade International – Malaysia, October 2002.

Feinburg, R. A. & de Ruyter, K. (1995). Consumer-defined service quality in international retailing. *Total Quality Management, 6* (1), March,

Forgas, J. P. (1979), Social Episodes, London, Academic Press, Inc., in Bitner, M.J. (1992). Servicescapes: The impact of physical surroundings on customers and employees. *Journal of Marketing, 56* (April), 57-71.

Ganesan, V. (2003a: April 2). Royal Ahold leaving Malaysia's retail scene? *Business Times*, New Straits Times.

Ghobadian, A., Speller, S. & Jones, M. (1994). Service quality: concepts and models. *International Journal of Quality & Reliability Management, 11* (9), 43-66.

Grönroos, C. (1984). A service quality model and its marketing implications. *Journal of the Academy of Marketing Science, 24* (1), Winter, 36 – 44.

Harris, K., Baron, S. & Ratcliffe, J. (1995).Customers oral participants in a service setting. *Journal of Services Marketing, 9* (4), 64-76.

Hoffman, K.D. & Bateson, J.E. (2001). *Essentials of Service Marketing: Concepts, Strategies, and Cases* (p. 324). (2nd. Ed.). Australia: South Western Thompson Learning.

Hurley, R. F. & Estelami, H. (1998). Alternative indexes for monitoring customer perceptions of service quality: a comparative evaluation in a retail context. *Journal of the Academy of Marketing Science, 26* (3), 209 – 221.

Imrie, B. C., Cadogan, J. W. & McNaughton, R. (2002). The service quality construct on a global stage. *Managing Service Quality, 12* (1), 10-18.

Izwan Idris (2002, March 23), Bigger share for hypermarkets. *The Star.*

Juran, J.M. How to Think About Quality. In Juran, J. M., and Godfrey, A. B. (Eds.). (1999). *Juran's Quality Handbook* (p. 2.1 – 2.3.). 5th Edition. New York, NY: McGraw-Hill.

Keillor, B. D., Hult, G. T. M., & Kandemir, D. (2004). A study of the service encounter in eight countries. *Journal of International Marketing*, 12 (1), 9-35.

Khalifah Othman (1987). A strategy of supermarket use in Malaysia. Unpublished PhD Thesis, University of Stirling.

Klemz, B. & Boshoff C. (2001). Environmental and emotional influences on willingness- to-buy in small and large retailers. *European Journal of Marketing, 35* (1/2), 70-91.

Koernig, S. K. (2003). E-Scapes: The electronic physical environment and service tangibility. *Psychology & Marketing, 20* (2), February, 151-167.

Lang, Chin Ying (1986). Patronage behaviour of supermarkets in Petaling Jaya and its managerial implications. *Malaysian Management Review*, 23 (3). 26-38.

Lim Yoke Mui, Nurwati Badarulzaman, and A. Ghafar Ahmad (2003). Retail activity in Malaysia: from shophouse to hypermarket. Paper presentation at the Pacific Rim Real Estate Society 9th Annual Conference, Brisbane, 20-22 January.

Maisara Ismail (2002, October 8). Retailers told to be cautious of global players' dominance. *Business Times*, p. 3.

Mattila, A. S. (1999). The role of culture and purchase motivation in service encounter evaluations. *Journal of Services Marketing*, 13 (4/5), 376-393.

Mehta, S. C., Lalwani, A.K. & Soon Li Han (2000). Service quality in retailing: relative efficiency of alternative measurement scales for different product-service environments. *International Journal of Retail & Distribution Management, 28* (2), 62-72.

Moreira, Debra (2003, November 15). Is Bigger Always Better? *Malaysian Business*. p. 37.

Ndubisi, N. O. (2003). Service marketing: are perceptions of service quality predictors of behavioral intentions? The Malaysian Borneo banking industry perspective, *Proceedings of the Academy of Marketing Studies, 8* (1), 37-44.

Nik Rahimah Nik Yaacob & Mohamad Naim Ahmad (1993). Addressing the customers: the influence of status, physical contact, and age in customers level of irritation. *Malaysian Management Review, 28* (2), June.

Norbani Che Ha & SharmilaSinnathurai. (1999). Dimensions of service quality by courier companies: consumers' perception. *Malaysian Journal of Consumer and Family Economics, 2*, 129-141.

Odekerken-Schröder, G., De Wulf, K., Kasper, H., Kleijnen, M., Hoekstra, J. & Commandeur, H. (2001). The impact of quality on store loyalty: a contingency approach. *Total Quality Management, 12* (3), 307-322.

Osman M. Zain & Ismail Rejab (1989). The choice of retail outlets among urban Malaysian shoppers. *International Journal of Retailing, 4* (2), 35-45.

Parasuraman, A., Zeithaml, V. A., & Berry, L.L. (1988). SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64* (1), Spring, 12-40.

Parasuraman, A., Zeithaml, V. A., and Berry, L.L. (1985) A conceptual model of service quality and its implications for future research. *Journal of Marketing, 49*, Fall, 41-50.

Prystay, C., (2002, May 2). The retail shopping war. *Far Eastern Economic Review.*

Robinson, S., (1999). Measuring Service Quality: Current Thinking and future Requirements. *Marketing Intelligence and Planning, 17/1*, 21-32.

Rosmimah Mohd. Roslin & Noraini Ismail (2002). Impak pasaraya besar terhadap para peruncit kedai kecil dan pengusaha kedai elektrik di Ampang, Submitted to Ministry of Domestic Trade and consumer Affairs, Malaysia.

Rosmimah Mohd. Roslin (2000). Discovering relational bonds in channel relationships: a case study of Malaysia. *Journal of Global Marketing, 14* (3), 49-76.

Sabry Tahir (2003, October 24). Traditional stores still popular, says ACNielsen," Starbiz, *The Star*, p. 6.

Samsinar Md Sidin, Yong Onn Soon, A., & Lim Siak Kwan. (2001). The relationship between employment status, perceived time shortage, and food shopping concerns: a study on the Malaysian wife. *Malaysian Journal of Consumer and Family Economics, 4*, 49-58.

Santos, J. (2002). From intangibility to tangibility on service quality perceptions: a comparison study between consumers and service providers in four service industries. *Managing Service Quality, 12* (5), 292-302.

Sharifuddin Zainuddin (1997) An analysis of perceived service quality in the Road Transport Department of Malaysia, Unpublished PhD Thesis, University of Pittsburgh.

Shemwell, D.J., Yavas, U. & Bilgin, Z. (1998). customer-service provider relationships: an empirical test of model of service quality, satisfaction, and relationship

Sieh Mei Ling (1974). The structure of retail trade in West Malaysia", *Occasional Papers on Malaysia Socio-Economic Affairs*, No. 2, Faculty of Economics & Administration, University of Malaya, December.

Sirohi, N., McLaughlin, E. W. & Wittink, D. R. (1998). A model of consumer perceptions and store loyalty intentions for a supermarket retailer. *Journal of Retailing, 74*(2), 223-245.

Siu, Noel Y. M. & Cheung, Jeff Tak-Hing (2001). A measure of service quality. *Marketing Intelligence and Planning, 19* (2), 88-96.

Sureshchandar G.S., Rajendran, C. & Anantharaman, R. N. (2002). The relationship between service quality and customer satisfaction – a factor specific approach. *Journal of Services Marketing, 16* (4), 363-379.

Tan Thiam Keat (1997). Customer service quality as a competitive strategy in the Malaysian automotive industry. Unpublished MBA thesis. Universiti of Malaya.

Ueltschy, L. C. & Krampf R. F. (2001). Cultural sensitivity to satisfaction and service quality measures. *Journal of Marketing*, Summer, 14-31.

Uusitalo, O. (2001). Consumer perceptions of grocery retail formats and brands. *International Journal of Retail & Distribution Management, 29* (5), 214-225.

Winsted, K. F. (1999). Evaluating service encounters: a cross-cultural and cross-industry exploration. *Journal of Marketing, 7* (2), Spring, 106-123.

Xiande Zhao, Changhong Bai, and Y.V. Hui, (2002). An empirical assessment and application of SERVQUAL in a mainland Chinese department store. *TotalQuality Management,13* (2), 241-254.

Youssef, M. A., Mohamed, Z., Gawyer, Jr., G., & Whaley, G. L. (2002). Testing the impact of integrating TQM and DFM on the ability of small to medium size firms to respond to their customer needs. *Total Quality Management, 13* (3), 301-313.

Zeithaml, Valerie (1987). Defining and relating price, perceived quality, and perceived value, Report No. 87-101, Cambridge, MA: Marketing Science Institute in Parasuraman, A., Zeithaml, V. A., and Berry, L.L. (1988). SERVQUAL: a multiple- item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64* (1), Spring, 15.

Dynamic Causal Relationships between Stock Price and Exchange Rate in ASEAN Countries

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ABSTRACT

This paper examines the dynamic causality between stock prices and exchange rates in 4 ASEAN countries, by using time-series techniques including unit root test, cointegration, VAR-based Granger causality test, impulse response functions. Unlike previous studies, the present one utilizes daily data to further examine the speed of adjustment in the causal relationship between the two variables before crisis, during crisis and after crisis. Our results show that for the period after crisis, three countries- Philippines, Singapore and Thailand supports the traditional approach in which exchange rate leads stock price, while non-causality is found in Indonesia. During crisis, the reverse direction is found in the Philippines, yet data from Indonesia indicates highly significant feedback relations. Most of the cases fail to reveal any recognizable pattern and sign before crisis. Results on the impulse response functions indicate that the largest part of response occurs in the first and second days, thereafter, the effect of the shock soon tapers off.

INTRODUCTION

One significant event that has occurred in the Association of Southeast Asian Nations (ASEAN) economies recently is the Asian financial crisis. In July 2, 1997, the announcement of the Bank of Thailand to abandon its defence of the Baht has caused the collapse of its currency. What appeared to be a local financial crisis in Thailand quickly escalated into an Asian financial crisis, spreading to other Asian countries like Indonesia, Korea, Malaysia, Singapore and the Philippines. This crisis has brought severe turmoil to ASEAN countries, with massive depreciation of local currencies and the collapse of stock markets, as shown in Table 1A and Table 1B.

Table 1A: ASEAN 4 Exchange Rate Fluctuations During Crisis

Exchange Rate	SG	TH	PH	ID
July 1, 1997	1.4287	24.52	26.348	2437.80
June 30, 1998	1.6840	42.15	41.499	14568.90
% Change	17.87	71.90	57.50	497.62

Notes: All the exchange rates are expressed as number of local currencies per U.S. dollar.
Sources: All figures are taken Datastream.

Table 1B: ASEAN 4 Stock Market Fluctuations During Crisis

Stock Index	SG	TH	PH	ID
July 1, 1997	1923.95	527.28	2815.54	731.62
June 30, 1998	1009.20	267.33	1760.13	445.92
% Change	-47.55	-19.30	-37.49	-39.05

Notes: All stock prices are based on daily market close. SG, Singapore; TH, Thailand; PH, Philippines; IN, Indonesia.
Sources: All figures are taken from Datastream.

All the four ASEAN countries suffered noticeable currency depreciation since July, 1997. During the period July, 1997 to June 1998, the Indonesian Rupiah experienced the greatest slide in its value (497.62%), followed by the Thai Baht (71.90%), the Philippines Peso (57.50%) and the Singapore Dollar (17.87%). Similar freefalls in stock prices were witnessed ranging from 19.30% of Thailand market to 47.55% of the Singapore market. The turmoil in both the currency and stock market has led many to wonder whether currency depreciation leads to the collapse in stock market or vice versa. This development will surely have an impact on the dynamic interactions between foreign exchange and stock markets.

Several authors have examined the effect of the Asian financial crisis on the causal relationship between exchange rates and stock prices. For instance, Granger *et al.* (2000) investigated the lead-lag relationship between stock prices and exchange rates before and during the Asian financial crisis for seven Asian countries: Hong Kong, Indonesia, Japan, South Korea, Malaysia, the Philippines, Singapore, Thailand, and Taiwan. Nagayasu (2001) empirically examined the Asian crisis by using the time series data of exchange rates and stock indices of the Philippines and Thailand.

Moving from previous studies, this paper aims to extend existing studies on the causality between exchange rates and stock prices to incorporate the impact of Asian financial crisis on ASEAN 4[1] financial markets. Specifically, by breaking the sample period into pre-crisis, crisis and post-crisis, this study examines whether the financial crisis has altered the causal relationship between exchange rate and stock price, and whether this new-found relationship, if any, holds even after the crisis. In short, this paper has two specific objectives:
i.   To investigate the short-run causality dynamics between exchange rate and stock price for the three sub-periods, utilizing Granger causality test.
ii. To examine the speed of adjustment (sign and timing) in this causal relationship, gaining insight from impulse response functions.

This paper is also written against the backdrop of some current developments in the ASEAN economies. Since the early 1990s, two significant developments have occurred in the ASEAN economies. One is the implementation of deregulation and liberalization of financial markets in this region, which was served to attract international investment and portfolio diversification. The other is the policy shift towards more flexible exchange rate regimes after the total collapse of the Bretton Woods system[2] in 1971. The adoption of more flexible exchange rate regimes has heralded a new era of increased exchange rate volatility. However, these two developments cannot be viewed separately because they open up a new area of study on the dynamic interactions between foreign exchange and stock markets.

The complex dynamic relationship between the foreign exchange and stock market may be due to some underlying macroeconomic fundamentals. For example, these linkages can be traced through the monetary model of exchange rate determination. According to this model, the exchange rate and stock price relationship depends on the magnitudes of both the exchange rate elasticity of real money demand and of real money supply. If real money balances are relatively exchange rate elastic, *depreciation* in exchange rate will lead to a portfolio adjustment that causes income and stock price to increase. Conversely, if the overall price level and real money supply is relatively exchange rate elastic, such a change will be brought by an *appreciation* in exchange rate. In other words, according to this model, exchange rates lead stock prices.

Another argument supporting that exchange rates lead stock prices was demonstrated by Krugman and Obstfeld (2000, Chap.16, p.449-454). They showed that the link between the exchange rate and the asset market equilibrium is the interest parity condition: $R = R^* + (E^e - E)/E$, where R and R^* are interest rates of domestic and foreign currencies and E and E^e denote exchange rate and expected future exchange rate respectively. For asset markets to remain in equilibrium, *ceteris paribus*, a decrease in domestic output (hence lower R due to reduced demand for money) must be accompanied by a currency depreciation (a greater value for E). Aggarwal (1981) has argued that a change in exchange rates could change stock prices of multinational firms directly and those of the domestic firms indirectly. In the case of a multinational firm, a change in exchange rate will change the value of that firm's foreign operation, which will be reflected on its balance sheet as a profit or a loss. Consequently, it contributes to current account imbalance. Once the profit or a loss is announced, that firm's stock price will change. This argument shows that devaluation could either raise or lower a firm's stock price depending on whether that firm is an exporting firm or it is a heavy user of imported inputs. If it involves in both activities, its stock price could move in either direction. This is true especially when most stock prices are aggregated to investigate the effects of devaluation on stock markets. From this viewpoint, exchange rate change is expected to give rise to stock price change. Such a causal relation is known as the traditional approach (Granger *et al.*, 2000).

In this dynamic relationship, movements in the stock market may also affect exchange rates, which can be explained by the portfolio balance model of exchange rate determination. According to this model, agents allocate their wealth among alternative assets such as domestic money, domestic securities and foreign securities. The role of the exchange rate is to balance the asset demand and supply. Thus, any change in the demand for and supply of assets will change the equilibrium exchange rate. For example, a decrease in stock

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[1] ASEAN 4 in this paper includes Indonesia, the Philippines, Singapore and Thailand.
[2] See http://www.econ.iastate.edu/classes/econ355/choi/bre.htm. The international monetary system known as the Bretton Woods system, was based on stable and adjustable exchange rates. Exchange rates were not permanently fixed, but there were occasional devaluations of individual currencies to correct fundamental disequilibria in the BP. Ever-increasing pressures in the 1960s culminated in the collapse of the Bretton Woods system in 1971, and it was reluctantly replaced with a regime of floating exchange rates.

prices causes a reduction in the wealth of domestic investors, which in turn leads to a lower demand for money with ensuing lower interest rates. The lower interest rates encourage capital outflows, *ceteris paribus*, which in turn is the cause of currency depreciation. Thus, in the portfolio approach, stock prices are expected to lead exchange rates with a negative correlation. If a market is subject to the influences of both monetary model and portfolio approach simultaneously, a feedback loop will prevail with an arbitrary sign of correlation between the two variables.

The empirical examination of the exchange rates and stock prices relationship has therefore attracted the interest of many researches for two main reasons. First, the relationship holds practical implications for regulators who are interested in the proper functioning of financial markets, in this case the dynamic interactions between foreign exchange and stock market. Second, the relationship is important to financial institutions, multinational corporations, or individual investors who are interested in internationally-diversified portfolios and management of foreign exchange risks.

The remainder of this paper is organised as follows: Section II reviews the empirical studies and research in related field. Data and methodologies are discussed in section III. Section IV analyses empirically the research results. Finally, conclusion is drawn in the last section.

LITERATURE REVIEW

The empirical examination of the causal linkages between stock prices and exchange rates has attracted the interest of many researchers to dwell on the two variables while market regulators and policy-makers attempt to explore the integration between exchange rates and stock prices for more efficient policy implications. However, investors, who deal directly to the stock market and currently face integrated financial markets, are interested in the interaction between the involved variables that can be profitably exploited. Even prior to the Asian financial crisis, this type of causality work was active and covered a range of countries, both developed and developing.

The developed financial markets, needless to say, have been the centre of attention, especially the U.S. markets (Aggarwal, 1981; Ma and Kao, 1990; Jorion, 1990; Bahmani-Oskooee and Sohrabian, 1992; Ajayi *et al.*, 1998). Although the analysis methods employed in the early studies are fundamentally similar, results are markedly varied.

Bahmani-Oskooee and Sohrabian (1992), for instance, found causality in both directions (bi-directional) between exchange rates and stock prices by using monthly observations for the period July 1973 to December 1998, while Ajayi *et al.* (1998) reported that SP granger caused EX volatility for the period April 1985 to August 1991. Aggarwal (1981) found a significant positive correlation between the US dollar and US stock price. On the other hand, Soenen and Hennigan (1988) reported a significantly negative impact of revaluation on stock prices. Ma and Kao (1990) attributed the differences in results to the nature of countries, i.e. whether they were export or import dominant. These varying results may be due to differences in the frequency of data used and the optimum lag chosen.

Recently, the research works on Asian countries have gathered momentum. For example, Abdalla and Murinde (1997) investigated the exchange rate-stock price relations in India, South Korea, Pakistan and the Philippines. Their studies concluded the existing of unidirectional causality from exchange rates to stock prices. Using daily data for the cases of Japan, Hong Kong and Singapore, Qiao (1996) found the stock price and exchange rate causal nexus to be different across countries. Specially, the direction of causation is bi-directional for Japan, is unidirectional from exchange rate to stock returns for Hong Kong, and is non-causal for Singapore. He also noted the presence of a strong long-run relationship in these countries. By applying the distributed-lag regression and VAR analysis on monthly data, Wu (2001) showed that exchange rates are negatively related to stock prices in Singapore.

The Asian financial crisis has attracted the interest of many researchers. Granger *et al.* (2000) investigated the lead-lag relationship between stock prices and exchange rates before and during the Asian financial crisis for seven Asian countries: Hong Kong, Indonesia, Japan, South Korea, Malaysia, the Philippines, Singapore, Thailand, and Taiwan. Nagayasu (2001) empirically examined the Asian crisis by using the time series data of exchange rates and stock indices of the Philippines and Thailand. The present study differs from these papers in that this study conduct a comprehensive study to find out the changes in this dynamic relationship before, during and after the crisis.
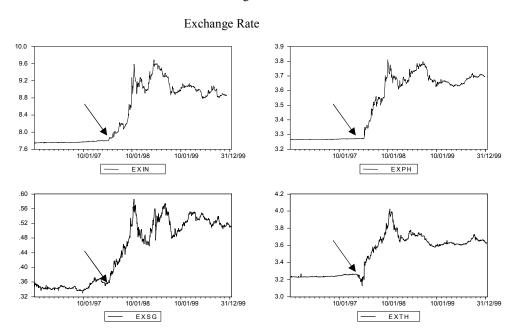
DATA AND METHODS

Data

This paper examines the dynamic causal relationships between exchange rates (EX) and stock prices (SP) for the four ASEAN countries: Thailand (TH), Singapore (SG), the Philippines (PH) and Indonesia (IN). Malaysia is excluded due to its ringgit was pegged against U.S. dollar since September 1998. Other countries in ASEAN are not included considering their importance and the market size consists only 2% of entire ASEAN market (ASEAN Secretariat Statistics, 1999) in the ASEAN economy. From the statistics provided by the ASEAN Secretariat, the four countries have contributed approximately 75% to the total ASEAN exports in 1998 and 1999.

Daily data (5 days a week) in total of roughly 990 observations for each country were retrieved from Datastream, covering the period from January 1, 1996 to December 31, 1999. Three sub-periods are used to better dissect the relations between exchange rates and stock prices. Period 1 (pre-crisis) covered from January 1, 1996 to June 30, 1997; Period 2 (crisis) started from July 1, 1997 and ended on June 30, 1998; Period 3 (post-crisis) continued from July 1, 1998 and through December 31, 1999. The end-of-day stock market indices used are as follows: Jakarta SE Composite Index for Indonesia; Philippines SE Composite Index for Philippines; Singapore Straits Times Index for Singapore and Bangkok S.E.T. Index for Thailand. Data on exchange rates are end-of-period nominal exchange rates, expressed as units of local currency per U.S. dollar. All the series are transformed into natural logarithm and are shown in time series plats (see Figure 1). This figure suggests a negative correlation between these two series, indicating that a depreciation of domestic currency (increase in exchange rate) was associated with a fall in stock prices or vice versa.
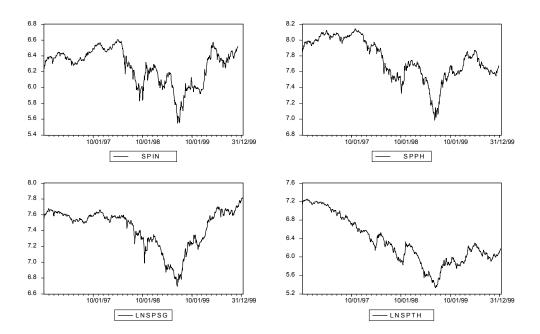
Figure 1: Time Series of ASEAN 4 Stock Prices and Exchange Rates

Notes: ➡ denotes exchange rates start depreciating due to the financial crisis.

Figure 1: Time Series of ASEAN 4 Stock Prices and Exchange Rates [Continued]

Stock Price

Unit Root Test

The ADF test is an extension of the Dickey-Fuller approach developed by Dickey and Fuller (1979). The ADF test of unit roots differs from the general DF test, in that it allows for constant and deterministic trends in the data. This study first tested for stationary and the order of integration of the variables, at levels as well as first differences. More specifically, this section tested whether SP and EX are integrated of order zero, $I(0)$, that is, whether they are stationary. This was achieved by performing the ADF test, based on a standard regression with a constant and a time trend as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1 T + \alpha_2 Y_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta Y_{t-i} + \varepsilon_t \tag{1}$$

where $\alpha_2 = p\text{-}1$, Δ = the first difference operator, T = time trend and ε_t = white noise error. The lag length k is selected so that all the residuals ε_t is white noise. The null hypothesis is that Y_t has unit root (non-stationary), that is H_0: $\alpha_2=0$, verses the alternative hypothesis that Y_t is stationary or H_1: $\alpha_2<0$. The test is done by Mackinnon test statistic at the 1% and 5% significant levels.

The KPSS test developed by Kwiatkowski *et al.*(1992) differs from the other unit root tests described here in that the series is assumed to be (trend-) stationary under the null. The KPSS statistic is based on the residuals from the OLS regression on the exogenous variables:

$$Y_t = \beta_1 X_t + u_t \tag{2}$$

and is defined as:

$$LM = \sum_t S(t)^2 / \left(T^2 \theta\right) \tag{3}$$

where, θ is an estimator of the residual spectrum at frequency zero and $S(t)$ is a cumulative residual function based on the residuals $\hat{u}_t = Y_t - X_t'\hat{\delta}$.

$$S(t) = \sum_{r=1}^{t} \hat{u}_r$$

The estimator of β used in this calculation differs from the estimator for β used by GLS detrending since it is based on a regression involving the original data, and not on the quasi-differenced data. Failing to reject null hypothesis implies that a variable is stationary. However, if null hypothesis is rejected by KPSS test, then a variable is said to be non-stationary.

Cointegration Test: Engle and Granger Method

Having established the order of integration of the individual series, this study proceeds to test for co-integration. The idea was to determine whether the stochastic trends in stock price and exchange rate that contain unit roots have a long run relationship. Various methods of estimating co-integration have been applied to capture the co-integration between the variables.

Due to the simplicity and 'superconsistency'[3] property, this study applied the two-step co-integration procedure suggested by Engle and Granger (EG) (1987). This study first runs the following co-integrating regression:

$$Y_t = \beta_0 + \beta_1 X_t + u_t \tag{4}$$

The null hypothesis is that the two series Y_t and X_t are not co-integrated. The second step is to test whether the residuals u_t is of $I(0)$ or not via the ADF technique. If u_t is found to be consistent with $I(0)$, one may claim that co-integration exists between Y_t and X_t or vice versa.

Granger Causality[4] Test

The cointegration technique pioneered by Engle and Granger (1987) and Granger (1986) made a significant contribution towards testing Granger Causality. Two or more variables are said to be cointegrated, i.e., they exhibit long-run equilibrium relationship(s), if they share common trend(s). As long as the two variables share common trend, Granger Causality must exist at least one direction either unidirectional or bidirectional (Granger 1986, 1988).

Once the statistical property of u_t is established, the bivariate vector autoregressive (BVAR) model can be adopted to test the Granger causality. If the variables are not co-integrated, the standard Granger causality test explained in the form of Granger (1969) will be used, that is:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=1}^{k} \alpha_{2i} \Delta X_{t-i} + \varepsilon_{1t} \tag{5}$$

$$\Delta X_t = \beta_0 + \sum_{i=1}^{k} \beta_{1i} \Delta Y_{t-i} + \sum_{i=1}^{k} \beta_{2i} \Delta X_{t-i} + \varepsilon_{2t} \tag{6}$$

where Y_t and X_t represent stock prices and exchange rates, respectively, ε_{it} is a white noise error, Δ is the first difference operator, and k is the lag length selected by Akaike's information criterion (AIC). Failing to reject null hypothesis H_0: all $\alpha_{2i} = 0$ implies that X_t does not Granger-cause Y_t. Conversely, Y_t does not Granger cause X_t if the null hypothesis H_0: all $\beta_{1i} = 0$ is not rejected.

However, if there is a co-integration between the two time series, the Granger causality model described above can be mis-specified (Engle and Granger, 1987). In that case, there is a need to add error correction term, (Y_{t-1} - γX_{t-1}) to the Granger causality model as shown below:

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[3] According to Harris (1995), if Y_t and X_t are both non-stationary $I(1)$ variables, and $u_t \sim I(0)$, then as sample size, T, becomes larger the OLS estimator of γ converges to its true value at a much faster rate than the usual OLS estimator with stationary $I(0)$ variables (Stock, 1987). That is, the $I(1)$ variables asymptotically dominate the $I(0)$ variables, ΔX_t, ΔY_t and u_t.
[4] Causality is a subject of great controversy among economists (Zellner, 1988). Interested readers could refer a supplementary issue of the *Journal of Econometrics*, September-October 1988, which includes some relevant studies. Without going into a debate, causality here refers to the concept of 'stochastic' or 'probablistic' sense, rather then the 'philosophical' or 'deterministic' sense (Masih and Masih, 1997).

$$\Delta Y_t = \alpha_0 + \delta_1\left(Y_{t-1} - \gamma X_{t-1}\right) + \sum_{i=1}^{k} \alpha_{1i}\Delta Y_{t-i} + \sum_{i=1}^{k} \alpha_{2i}\Delta X_{t-i} + \varepsilon_{1t} \tag{7}$$

$$\Delta X_t = \beta_0 + \delta_2\left(Y_{t-1} - \gamma X_{t-1}\right) + \sum_{i=1}^{k} \beta_{1i}\Delta Y_{t-i} + \sum_{i=1}^{k} \beta_{2i}\Delta X_{t-i} + \varepsilon_{2t} \tag{8}$$

where δ_1 and δ_2 denote speeds of adjustment. Failing to reject the null hypothesis H_0: all $\alpha_{2i} = 0$ and $\delta_1 = 0$ implies that X_t does not Granger-cause Y_t. On the other hand, failing to reject H_0: all $\beta_{1i} = 0$ and $\delta_2 = 0$ indicates Y_t do not Granger-cause X_t.

Impulse Response Functions

After determining the direction of causality, the impulse response functions (IRFs) are used to investigate the dynamic interaction (signs and timing) between exchange rates and stock prices. This technique is based on the following VAR model:

$$Y_t = A_0 + \sum_{s=1}^{k} A_s Y_{t-s} + e_t \tag{9}$$

The VAR model will then be expressed as a moving average representation in order to know how a random shock in exchange rate (stock price) affects stock price (exchange rate). Thus, Equation 9 becomes:

$$Y_t = \sum_{s=0}^{\infty} B_s e_{t-s} \tag{10}$$

The exchange rate (stock price) is expressed as a function of its past innovations from stock price (exchange rate) in Equation 10. The innovations can be transformed into orthogonalised innovations through Cholesky decomposition (see Eun and Shim, 1989) in order to analyse the response of exchange rate (stock price) to a unit shock in stock price (exchange rate) within s periods. Equation 10 is then written as:

$$Y_t = \sum_{s=0}^{\infty} C_s u_{t-s} \tag{11}$$

From Equation 11, the response of exchange rate (stock price) to a shock of one standard error in stock price (exchange rate) with s periods is represented by each element in C_s. This is called the "impulse response" of that exchange rate (stock price).

RESEARCH RESULTS

Unit Root Test Results

The results for the unit root tests are reported in Table 2. If the absolute value of ADF test statistic is greater than the critical value, then the null hypothesis can be rejected, and the series is said to be stationary. The findings suggest that they are all stationary after applying the difference filter only once at the 1% significance level.

In order to ensure the robustness of the stationarity results, this section subject each of the series to KPSS test, firstly in their levels, followed by their first difference. All the LM statistics exceed the critical values at 1% of significance interval, indicating they are non-stationary. By applying both methods, the results in Table 2 show that all the EX and SP are integrated of the same order which is order one, $I(1)$. This condition permits the study to proceed with the cointegration tests.

Table 2: Unit Root Test using Augmented Dickey-Fuller Test

	ADF test statistic			KPSS test (LM statistic)		
	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
Level						
EX_{IN}	-2.08	-2.16	-2.30	0.503***	0.263***	0.264***
SP_{IN}	-1.88	-2.28	-2.50	0.283***	0.320***	0.268***
EX_{PH}	-3.55	-2.22	-1.20	0.461***	0.396***	0.488***
SP_{PH}	-2.11	-2.29	-1.56	0.345***	0.324***	0.356***
EX_{SG}	-2.30	-2.06	-2.23	0.334***	0.325***	0.261***
SP_{SG}	-2.15	-2.69	-2.32	0.301***	0.166**	0.268***
EX_{TH}	-2.61	-2.61	-2.17	0.281***	0.407***	0.404***
SP_{TH}	-2.95	-1.51	-1.82	0.446***	0.179**	0.317***
First Difference						
ΔEX_{IN}	-20.67***	-15.30***	-17.70***	0.103	0.068	0.067
ΔSP_{IN}	-15.68***	-12.74***	-15.13***	0.119	0.073	0.122
ΔEX_{PH}	-16.08***	-11.58***	-15.18***	0.127	0.063	0.104
ΔSP_{PH}	-15.92***	-12.51***	-16.60***	0.048	0.103	0.142
ΔEX_{SG}	-18.85***	-16.35***	-21.93***	0.060	0.053	0.066
ΔSP_{SG}	-17.31***	-13.44***	-15.63***	0.102	0.045	0.095
ΔEX_{TH}	-22.43***	-19.33***	-20.38***	0.033	0.087	0.111
ΔSP_{TH}	-17.42***	-12.32***	-16.60***	0.035	0.119	0.075

Notes: *** denotes rejection of the null hypothesis at the 1% significance level. The critical values for rejection are -3.98 (-3.99 for crisis period due to different degree of freedom) at the 1% significance level with constant and trend. These values provided by ADF Test output based on MacKinnon (1996). The critical values for KPSS test are 0.216 at the 1% significance level.

Cointegration Test Results

For the Engle and Granger (EG) cointegration tests, the regressions were run in the form where each variable was a function of the others. The tests of the residuals of the crude EG method at the 1% significance level describe in Table 3. The findings show that when the EX is treated as dependent variable, the absolute ADF statistics for all the residuals (u_t) are smaller than the critical value, indicating that they are non-stationary at levels. In short, EX and SP are said to be not cointegrated. Likewise, the statistics of the reverse-order regressions fail to reject the null hypothesis that no cointegration exists between EX and SP at the 1% significance level. These findings are consistent with the study by Granger *et al.* (2000), who find no cointegration between exchange rates and stock prices in nine Asia Countries.

Table 3: Engle and Granger Cointegration Test

	ADF Test Statistic						
Resid	Pre-crisis	Crisis	Post-crisis	Resid	Pre-crisis	Crisis	Post-crisis
$u_t(IN)$	-3.35	-1.82	-2.57	$e_t(IN)$	-3.18	-2.18	-2.61
$u_t(PH)$	-3.36	-2.10	-2.91	$e_t(PH)$	-2.10	-2.28	-3.65
$u_t(SG)$	-2.23	-2.19	-2.23	$e_t(SG)$	-2.13	-2.37	-1.95
$u_t(TH)$	-2.55	-2.91	-2.43	$e_t(TH)$	-2.35	-0.92	-3.24

[Regression Model(A): $EX_t = \alpha_0 + \alpha_1 SP_t + u_t$]
[Regression Model(B): $SP_t = \beta_0 + \beta_1 EX_t + e_t$]
Notes: The critical values for rejection are -3.98, -3.42 and -3.13 at the 1%, 5% and 10% significance levels, respectively for the model with constant and trend in pre-crisis and post-crisis periods. The critical values for rejection are -3.99, -3.43 and -3.14 at the 1%, 5% and 10% significance levels, respectively for the model with constant and trend in the crisis period. These values are provided by EViews output based on MacKinnon (1996) one-sided *p*-values.

Granger Causality Test Results

Due to the lack of cointegration between EX and SP in ASEAN 4 markets, traditional bivariate VAR-based Granger causality test will be sufficient for studying the linkages between the two variables. The optimum lags have been chosen based on Akaike's information criterion (AIC). The F-statistics at the 5% and 10% significance levels are used to test the null hypothesis. If the F-statistic is larger than critical value, null hypothesis is rejected, indicating that causality is running from one variable to another. Summary results of causality for the three sub-periods are reported in Table 4.

Table 4: Pairwise Granger Causality Test

Panel A: Pre-crisis		
Null Hypothesis	F-Statistic	Probability
SP_{IN} does not Granger Cause EX_{IN}	0.6440	0.5872
EX_{IN} does not Granger Cause SP_{IN}	0.3796	0.7678
SP_{PH} does not Granger Cause EX_{PH}	1.0915	0.3605
EX_{PH} does not Granger Cause SP_{PHI}	1.4898	0.2047
SP_{SG} does not Granger Cause EX_{SG}	0.6752	0.5677
EX_{SG} does not Granger Cause SP_{SG}	1.9517	0.1209
SP_{TH} does not Granger Cause EX_{TH}	1.1490	0.3273
EX_{TH} does not Granger Cause SP_{TH}	3.9051	9.60E-05**

Panel B: Crisis		
Null Hypothesis	F-Statistic	Probability
SP_{IN} does not Granger Cause EX_{IN}	2.2743	0.0234**
EX_{IN} does not Granger Cause SP_{IN}	2.1592	0.0316**
SP_{PH} does not Granger Cause EX_{PH}	2.1962	0.0892*
EX_{PH} does not Granger Cause SP_{PH}	1.8421	0.1401
SP_{SG} does not Granger Cause EX_{SG}	0.9969	0.4393
EX_{SG} does not Granger Cause SP_{SG}	3.7117	0.0004**
SP_{TH} does not Granger Cause EX_{TH}	0.7669	0.4656
EX_{TH} does not Granger Cause SP_{TH}	0.6549	0.5204

Panel C: Post-crisis		
Null Hypothesis	F-Statistic	Probability
SP_{IN} does not Granger Cause EX_{IN}	1.5609	0.2114
EX_{IN} does not Granger Cause SP_{IN}	1.1918	0.3049
SP_{PH} does not Granger Cause EX_{PH}	1.3031	0.2732
EX_{PH} does not Granger Cause SP_{PH}	8.7292	1.30E-06**
SP_{SG} does not Granger Cause EX_{SG}	0.5013	0.6061
EX_{SG} does not Granger Cause SP_{SG}	2.7105	0.0678*
SP_{TH} does not Granger Cause EX_{TH}	1.2219	0.3015
EX_{TH} does not Granger Cause SP_{TH}	4.0536	0.0075**

*(**) denotes rejection of the null hypothesis at the 10% and 5% significance levels, respectively.

During pre-crisis (refer Table 4, Panel A), there exists interaction between EX and SP for Thailand at the 5% level. There is clear evidence of highly significant of short-term unidirectional causality from the EX to the SP in Thailand. However, there is no interaction between two variables for the other three countries (Singapore, Philippines and Indonesia). The results indicate that the stock price is not informationally efficient before crisis in ASEAN 4 countries.

Results for crisis period, however, provide somewhat different story. In summary, F-tests indicate quite in contrast to the pre-crisis period. Based on Table 4, Panel B, this study find that the null hypothesis (no-causation from EX to SP) is rejected in the case of Indonesia, Singapore (5% level) and the Philippines (10% level). Similarly, the non-causality from SP to EX is rejected in the case of Indonesia (5% level). Three out of four countries exhibit significant interactions between EX and SP. In the case of Singapore, changes in the EX lead that in SP. The reverse direction is found in the Philippines, whilst the market in Indonesia is characterized by feedback interactions in which changes in EX can take the lead and vice versa. The two variables do not Granger-cause each other in Thailand. The results are at variance with the findings of Granger *et al.* (2000). They found that both Singapore and Thailand experienced bidirectional causations between EX and SP whereas the Philippines showed the same causation as above. On the other hand, Nagayasu (2001) examined spans from July, 2 1997 to December, 31 1998, demonstrating that SP prone to lead EX in Thailand and the Philippines.

After the crisis, another trend of causality can be drawn from the results in Table 4, Panel C. The results show only unidirectional causality, that is, the EX is causally linked to the SP without feedback effects in Philippines, Singapore and Thailand. Non-causality between EX and SP can be seen in Indonesia.

Impulse Response Functions Analysis

Given the definitive patterns, the Granger causality test does not provide signs and timings of these relations. Thus, this study conducts the impulse response functions (IRF) to further examine short-run dynamic relations of ASEAN 4 countries. A scrutiny of Table 5 reveals that the results from the impulse response are in consistent with that of Granger causality test. Likewise, if the Granger causality test indicates change in EX leads SP, the responses of SP from one-unit shock of EX are significant. Such is the case for Indonesia (crisis), the Philippines (post-crisis), Singapore (crisis and post-crisis) and Thailand (pre and post-crisis).

Table 5: Estimation Results of Impulse Response Functions

Panel A: Response of exchange rates from one-unit shock in stock price				
Country	Day(s)	Pre-crisis	Crisis	Post-crisis
IN	1	0.00000	0.00000	0.00000
	2	-0.00020	-0.00239	-0.00212
	3	3.45E-05	-0.00335	-0.00078
	5	5.60E-06	1.17E-02	-3.88E-05
	10	-2.02E-07	8.92E-05	-3.51E-09
PH	1	0.00000	0.00000	0.00000
	2	-4.68E-05	-0.00112**	-0.00044
	3	-8.68E-06	-0.00196**	-0.00030
	5	1.43E-05	0.00086	4.69E-05
	10	4.86E-07	1.39E-05	2.82E-06
SG	1	0.00000	0.00000	0.00000
	2	2.63E-05	-0.00122	-0.00021
	3	-8.71E-04	0.00035	0.00011
	5	2.69E-05	7.71E-04	-6.42E-06
	10	-5.19E-07	-1.39E-04	1.09E-08
TH	1	0.00000	0.00000	0.00000
	2	5.04E-05	-0.00139	-0.00541
	3	-6.01E-04	0.00012	0.00031
	5	3.16E-04	5.15E-05	7.53E-05
	10	-7.08E-05	2.63E-07	1.04E-06

Table 5: Estimation Results of Impulse Response Functions (Continued)

Panel B: Response of stock prices from one-unit shock in exchange rate				
Country	Day(s)	Pre-crisis	Crisis	Post-crisis
IN	1	-0.00070	-0.00670**	-0.00256
	2	-0.00062	0.00073	-0.00247
	3	-0.00027	0.00089	-5.11E-05
	5	1.26E-04	-3.91E-04	7.89E-06
	10	-1.16E-06	-7.25E-04	3.52E-09
PH	1	0.00038	-0.00576	-0.00463**
	2	-0.00060	-0.00413	-0.00201**
	3	-0.00111	-0.00216	-0.00491**
	5	7.42E-04	0.00029	0.00087
	10	3.52E-05	-9.31E-06	2.53E-05
SG	1	0.00008	-0.00708**	-0.00114
	2	-3.23E-04	-0.00558**	-0.00220**
	3	0.00026	-0.00137	-0.00125
	5	0.00024	-5.14E-03	9.51E-05
	10	-7.20E-06	8.71E-04	-2.74E-08
TH	1	0.00097**	-0.00955**	-0.00443**
	2	0.00115	0.00089	-0.00361**
	3	1.77E-03	0.00149	-0.00351
	5	-0.00132	2.90E-06	0.00056
	10	1.78E-03	3.52E-07	1.37E-05

** denotes the 5% significance level.

According to Table 5, taking a ten-day forecasting horizon, the IR analysis implies that during crisis, the Philippines SP do not response immediately to the changes in EX. The response only begins on day 2 and ends on day 3 (negatively). After the crisis, the Philippines shows reverse relationships with the same sign, namely, one standard deviation decrease in EX gave rise to the downfall of SP. This one-directional effect lasts for three days before it diminishing. An interesting result can be identified here is except Indonesia, one unit change in EX in the Philippines, Singapore and Thailand has largely negatively impacts on SP with the length of three (first three days), one (second day), and two (first two days) days respectively. Before crisis none (except Thailand, EX leads SP) show significant causality between EX and SP.

Overall, three distinctive patterns can be summarised from the above analysis. First, during crisis, some countries exhibited portfolio approach (SP leads EX) trend while others encountering causality supported traditional trend (EX leads SP) or both. The signs of causality is arbitrary and hardly to be recognised. Second, after crisis, three out of four countries reveal negative unidirectional interactions from EX to SP which is in line with what actually happened in the market. In other word, one-unit shocks from the SP have very discernible negative responses on their corresponding EX. Third, in most cases, the largest part of response occurs in the first and second days, thereafter, the effect of the shock soon tapers off. In short, the trends have been markedly changed from unidentified causality before the crisis, to one-directional causal after the crisis, with negative correlation from EX to SP.

CONCLUSION

This paper applied the advanced statistical techniques with daily data to analyse the causality between exchange rates and stock prices in four ASEAN countries. The results indicate that most markets were largely characterized by the phenomenon predicted under the traditional approach, that is, changes in exchange rates lead that in stock prices. Built on the result of the Granger causality test, the impulse response analysis lends further support to the importance of exchange rate as the leader (negative correlation with stock price), particularly after ASEAN financial crisis period.

The findings are in conformity with the general perception of the ASEAN financial crisis that engulfed the entire ASEAN in 1997. This crisis was triggered by the severe devaluation of Thai Baht and thus set off a financial avalanche in the stock markets: The radical depreciation of the currencies in ASEAN countries caused panic among the foreign investors. They began to sell their commodities in large scale. Stock prices were tumbling downs in response to the depreciation of the exchange rates. Within months, this contagious effect

actuated a complete downfall of the stock markets in all ASEAN economies. Given the above case and research findings, policy makers should therefore focus on foreign exchange markets while aiming to stabilise both the exchange rates and stock markets. As for domestic or international investors, evaluating the stability of the exchange rates would help avoid biased judgement.

Finally, it is essential to point out that even though the Granger causality and IRFs may exhibit some statistical relations, it is sometimes difficult to interpret the underlying fundamental economic relation based on those results (Granger *et al.*, 2000). It is likely that the results may be generated from other structure relations, i.e., via interest parity condition. This would be useful when there arise some recessionary shocks in the country (for example, incident September 11, 1999) that will cause a crash in stock price or an exchange rate. In this case, the signs and timing relations between the stock price and exchange rate will be generated from the relative efficiency of the stock market and foreign exchange market. In addition, this paper could also be extended to better understand how the crisis erupted and transmitted to other countries. It would be interesting if one could employ non-linear model and explore other financial variables, such as interest rates or money supply that are crucial policy instruments in conducting monetary and exchange rate policies in these countries.

REFERENCES

Abdalla, I.S.A. and Murinde, V. (1997) Exchange rate and stock price interactions in emerging financial markets: evidence on India, Korea, Pakistan and the Philippines. *Applied Financial Economics*, 7, 25-35.

Aggarwal R. (1981) Exchange rates and stock prices: A study of the US capital markets under floating exchange rates. *Akron Business and Economic Review*, 12, 7-12.

Ajayi, R.A., Friedman, J., Mehdian, S.M. (1998) On the relationship between stock returns and exchange rate : Test of granger causality. *Global Finance Journal*, Fall/Winter98, 9(2), 411-21.

ASEAN Secretariat Statistics. (1999) <*http://www.aseansec.org/*>

Bahmani-Oskooee, M. and Sohrabian, A. (1992) Stock price and the effective exchange rate of the dollar. *Applied Economics*, Apr 1992, 24(4), 459-464.

Dickey, D.A. and Fuller, W.A. (1979) Distribution of the estimation for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74, 427-431.

Engle, R.F. and Granger, C.W.J. (1987) Cointegration and error correction: representation, estimation, and testing. *Econometrica*, 55, 251-276.

Eun, C.S. and Shim, S. (1989) International transmission of stock market movements. *Journal of Financial and Quantitative Analysis*, 24(2), 241-256.

Granger, C.W.J. (1969) Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, 37, 424-439.

Granger, C.W.J. (1986) Developments in the study of cointegrated economic variables. *Oxford Bulletin of Economics and Statistics*, 48, 213-218.

Granger, C.W.J. (1988) Some recent developments in a concept of causality. *Journal of Econometrics*, 39, 199-211.

Granger, C.W.J., Huang, B.H., Yang, C.W. (2000) A bivariate causality between stock process and exchange rates: evidence from recent Asian flu. *The Quarterly Review of Economics and Finance*, 40, 337-354.

Jorion, P. (1990) The pricing of exchange rate risk in the stock market. *Journal of Financial Quantitative Analysis*, 26(3), 363-376.

Krugman, P.R. and Obstfeld, M. (2000) *International Economics : Theory and Policy*, 5th Edition, 449-454, Addison Wesley Logman, United States.

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P., Shin, Y. (1992) Testing the null hypothesis of stationary against the alternative of a unit root: how zsure are we that economic time series have a unit root? *Journal of Econometrics*, 54, 159-178.

Ma, C. and Kao, G. (1990) On exchange rate changes and stock price reactions. *Journal of Business Finance and Accounting*, summer, 441-449.

MacKinnon, J.G. (1996) Numerical distribution functions for unit root and cointegration tests. *Journal of Applied Econometrics*, 11, 601-618.

Masih, A.M.M. and Masih, R. (1997) A comparative analysis of the propagation of stock market fluctuations in alternative models of dynamics causal linkages. *Applied Financial Economics*, 7, 59-74.

Nagayasu, J. (2001) Currency crisis and contagion: Evidence from exchange rates and sectoral stock indices of the Philippines and Thailand. *Journal of Asian Economics,* 12, 529-546.

Qiao, Y. (1996) Stock prices and exchange rates: experiences in leading East Asian Financial Centres – Tokyo, Hong Kong and Singapore. *Singapore Economic Review,* 41, 47-56.

Quantitative Micro Software (2000) *E-Views 4 User's Guide*, United States.

Soenen, L.A. and Hennigar, E.S. (1988) An analysis of exchange rates and stock prices-the U.S. experience between 1980 and 1986. *Akron Business and Economic Review*, Winter, 7-16.

The Bretton Wood System. <*http://www.econ.iastate.edu/classes/econ355/choi/bre.htm*>

Wu, Y. (2001) Exchange rates, stock prices, and money markets: evidence from Singapore. *Journal of Asian Economics*, Fall2001, 12(3), 445-458.

Zellner, A. (1988) Causality and causal laws in economics. *Journal of Econometrics*, 39, 7-21

Empirical Modeling for Analyzing the Variability of Price to Earnings (PE) Ratios of Firms in Different Industries

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ABSTRACT
In this paper, the conflicting opinions in existing literature about the effect of financial risk on PE ratios of various firms in different industries are studied and analyzed. For that purpose, data of various firms in U.S. are collected and analyzed over the period from 1993 to 1995. This paper shows empirically the notion that the higher the risk of a firm, the lower its PE ratio should be holds true only beyond a certain value of long-term financial risk of the firm. Furthermore, it shows that low PE stocks of various firms may not necessarily be the stocks with high financial risk. However, other risks of the firm such as business risk, alternative financial risks, and purchasing power risk are analyzed, and found to have insignificant effect on this ratio. The general notion of this ratio being strongly related to expectations of future earnings of a firm is also confirmed in the paper.

INTRODUCTION

In finance literature, many studies have been conducted over the expectations of earnings and corresponding share prices (Givoly (1985), Capstaff et al. (1995), Elton et al. (1981), and Philbrick & Ricks (1991)). However, these studies are limited in their analysis to finding whether a particular source of data is more   useful   than the   other sources for expectations of share prices.

There have also been conflicting opinions on the effect of financial risk of a firm on the PE ratio of its stock. (Moyer et al. 1998, Kolb 1995). The focus of this paper is to examine this effect in detail. The prevailing general notion is that PE ratio of a firm increases with the expectations of earnings growth, and decreases with the increase in the risk of a firm. In general, the higher the risk of a firm, the lower its PE ratio. Thus, firms with stocks of low PE values, according to general notion, are riskier, and have low earnings growth potential than firms with high PE values. However, low PE stocks have been found to outperform high PE stocks. (Basu (1983) and Levy and Larman (1985)). Thus, combining the general notion and the prior research by Basu (1983), it would imply, on average, stocks of firms with low PE ratios having higher risk, and with low earnings growth potential provide higher returns. This is a contradiction in investment logic. Thus, this provided motivation to study this phenomenon further.

There are various objectives of this study. First, to examine whether different risks of a firm affect its PE ratio. Stated differently, does the PE ratio of a firm decrease monotonically with the increasing financial risk of the firm? Similarly, does the PE ratio of a firm decrease monotonically with the increasing business risk, especially operating leverage of the firm? Second, to test whether any non-linear relationships for these risk variables exist for this ratio of a firm. Third, whether the types of industries to which the firms belong to have any influence on their PE ratios. Fourth, does the anticipated inflation rate has any effect on this ratio of a firm? Fifth, do the PE ratios of firms vary because of their either size or sales volume? Last, whether forecasted growth rate in earnings per share for the next year of a firm affects this ratio?

LITERATURE REVIEW

The following three paragraphs describe the conflicting thoughts on PE ratio, earnings per share, and stock price of a firm with respect to its debt ratio.

Moyer et. al (1998) indicate that in general, the lower a firm's risk, the higher its PE ratio should be. This implies that there may be some situations when this general notion may not hold true. One of the objectives of this study is to find such unusual situations.
However, Kolb (1995) states that if leverage is used in such a way that real tax benefits are captured, the firm

with debt may well have a higher justified PE ratio than zero debt firm. Otherwise, the low-debt or zero-debt firm should have the higher PE ratio, other factors being equal. He further indicates that the degree of financial leverage is important for both its effects on the risk level of the firm and earnings growth, and in determining the PE ratio.

Brigham and Houston (2002) also show by a theoretical example concave downward curves for firm's both expected earnings per share (EPS) and stock price with respect to firm's debt to assets ratio. In other words, the values of both EPS and price per share first increase, reach their maximum levels, and then decrease. It implies that PE ratio curve of the firm may also follow a concave curve, and may not decrease monotonically with respect to firm's debt to assets ratio. As stated earlier, one of the objectives of this paper is to determine empirically whether this is true or not.

Lie et al. (2002) evaluated various multiples that practitioners use to estimate company value. They found that using forecasted earnings rather than trailing earnings improves the estimates of PE multiple. In this study, an analyst's forecast data such as of Value Line Investment Survey (VLIS) instead of consensus growth rate of forecasts by other analysts relating to the expected growth in earnings of various firms are used for this purpose. This organization forecasts are used as these have been found to be more accurate than IBES and /or consensus forecasts in earlier studies by Elton et al. (1981), Philbrick and Ricks (1991), and Capstaff et al. (1995).

Furthermore, stocks of individual firms are analyzed as standalone stocks for their PE ratios and not analyzed in a portfolio context. Thus, the risk for stock of a firm in this study is measured by fundamental factors instead of its beta in order to test the various hypotheses postulated earlier. The theory recognizes specific types of risk factors---namely, interest rate risk, purchasing power risk, financial risk, business risk, and market risk (Fischer and Jordan 1983). Furthermore, Thompson II (1976) has generally concluded that there is a significant relationship between the market measure of risk and fundamental measures of risk. This consistency seems reasonable because in a properly functioning capital market, an investor would expect a firm that has high business and financial risks to have an above average beta (Reilly and Norton, 1995). Thus, in this paper, business risk, long-term financial risk and alternative measures of financial risks, and purchasing power risk of firms are included instead of betas for analysis of PE ratios to test the various hypothesis postulated earlier in this paper. This is where this paper contributes to the existing literature in determining the effect of these fundamental measures of risk on PE ratios of firms.

Harris & Raviv (1990a), and Stulz (1990) find that leverage is positively correlated with the firm value. The size of the firm is also included as a variable in this study as Stoll and Whaley (1983) find that after adjustment of transaction costs and market risk, stocks of small firms earn lower returns than stocks of large firms if bought and held for two months or less, and do not earn positive excess returns even if held for three months to one year in length. However, Banz (1981) and Reinganum (1981) find that risk-adjusted stock returns are a monotonically decreasing function of firm size. This result is also supported by Aggarwal et al. (1990). A study by Nomura Securities and Dorfman (1994) shows that higher inflation depresses PE ratios.

Pearce and Roley (1988) empirical results indicate that time-varying firm characteristics especially a firm's debt-equity ratio appears to be particularly important in determining the effect of unanticipated inflation on its stock's rate of return. Thus, the leverage factor(s) are included in this study to capture this effect.

Similarly, Bae (1990) lends strong support for a negative effect of both current and unanticipated interest rate changes on common stock returns of financial firms—although he observes some exceptions such as stock returns of most sub-sectors of both financial and non-financial firms are insensitive to anticipated interest rate changes. Zarowin (1990) and Cho (1994) used EP (Earnings to price) ratios instead of PE ratios as they believed that EP ratios exhibit linearity whereas PE ratios do not.

HYPOTHESES

In this study, the following hypotheses are postulated and examined.

H1. The higher the forecasted increase in earnings per share (EPS) of a firm (as shown by Value Line Investment Survey, VLIS), the higher the firm's PE ratio.

H2. The higher the firm's financial risk measured in any of the forms such as higher debt to assets ratio, or higher long-term financial leverage ratio, or higher long-term debt to total debt ratio, the lower is its PE ratio. In

other words, this ratio decreases monotonically with the increasing financial risk of the firm.

H3. The higher the firm's business risk in the form of its higher operating leverage, the lower is its PE ratio. In other words, this ratio decreases monotonically with increasing operating leverage of a firm.

H4. The size and / or sales volume of a firm do not affect a firm's PE ratio.

H5. Purchasing power risk in the form of anticipated future inflation rate does not have any effect on a firm's PE ratio.

DATA COLLECTION AND METHODOLOGY

The period of study is from 1993 to 1995. The data are collected from various sources such as Value Line Investment Survey (VLIS), Moody's Industrial Manuals, Moody's Public Utility Manuals, and Wall Street Journals for years 1993 to 1996.

The criteria used to include firms from various industries in the sample are a) fiscal year of a firm should end on December 31 as for that date, all the relevant financial information for the last year about the firm under study is available from the April issues of VLIS. The other firms whose fiscal year ends at some different period (s) are excluded from the sample, b) annual earnings for the forecast year and the preceding year of the firm should be available, and c) the firm should be listed in New York Stock Exchange.

The above set of criteria resulted into a statistically large sample of 88 firms whose data are used and analyzed in various models shown in the paper. These firms fall into five different industries. These industries are Petroleum and /or Natural Gas (Industry-Type 1), Chemical (Industry-Type 2), Medical (Industry-Type 3), Manufacturing, Manufacturing Steel, and Aerospace (Industry-Type 4), and Electric Utility (Industry-Type 5).

Industry-Type 1 is a basic materials / energy industry. Industry-Type 2 is a consumers durables industry. Industry-Type 3 is a consumer staples industry. Industry-Type 4 is a capital goods industry, and Industry-Type 5 is a public utility industry. Dummy variables of the type 1 if a firm is present in a particular industry, and 0 otherwise are used for each industry except for the industry type 5 in various models analyzed in this study.[1]

The expected annual growth in earnings per share of various firms is determined from published information of Value Line Investment Survey (VLIS) issues. Similarly, the expected annual change in 3-month T-bill rate, consumer price index (CPI), and industrial production are the published figures in VLIS (Value Line Investment Survey) issues, and used in this study. All the data used in this study are as on December 31 of a particular year.

The general form of the various models analyzed in this paper is
PE = f (FSV, AFV, MEV)
where

PE = The Wail Street Journal published PE ratios of various firms
in different industries. The prevailing and not the forecasted PE ratios of various firms are regressed on various variables
FSV = Firm's specific variables
AFV = Analyst's forecasted variable about firms. In this study, as mentioned earlier, VLIS forecasts about next year's EPS for various firms in different industries are used.
MEV = Macroeconomic variables such as purchasing power risk and general economic growth in the market.
Thus, the list of the various variables of a firm used in various models is shown below:
WSPE = Wall Street Journal published PE ratio of a firm as on December 31.
WSEP = 1 / WSPE
FWATAS = Net fixed assets including work-in-progress, if any to total assets [2]
FWATASQ = Square of FWATAS= FWATAS * FWATAS
LTDTTD = Long-term debt to total debt
LTDTTDSQ = Square of LTDTTD = LTDTTD * LTDTTD
LTDTAST = Long-term debt to total assets[3]
LTDTASTSQ = Square of LTDTAST = LTDTAST * LTDTAST
TDTAST = Book leverage or Total debt (Both short-term and long-term debt) / Total assets

TDTASTSQ = Square of TDTAST = TDTAST * TDTAST
LNMV = Log (Market Value) = Log (Number of shares outstanding * Current market price /share)[4]
LNSALES = Log of sales[5]
EPSTGR = Annual growth rate of earnings per share as forecasted by VLIS[6]
INDTYPE1 = Firms in Petroleum and /or Natural gas industries
INDTYPE2 = Firms in Chemical industry
INDTYPE3 = Firms in Medical industry
INDTYPE4 = Firms in Manufacturing, Manufacturing steel, and /or Aerospace industries
INDTYPE5 = Firms in Electric Utility industry
TBILFAC = Forecasted annual change in 3 month T-bill rate
FCPIGR = Forecasted annual change in CPI
FIPGR = Forecasted annual change in industrial production[7]

The highly correlated variables are excluded in each model to remove multi-collinearity problem among independent variables. For example, log of sales (LNSALES) of a firm is found highly correlated with log of its market value (LNMV). Thus, various alternate models are used and shown in this paper to analyze separately the impact of these two variables. Similarly, forecasted annual change in industrial production (FIPGR) is found highly correlated with both annual changes in CPI (FCPIGR) and 3 month T-bill rates (TBILFAC). Moreover, FCPIGR is also found highly correlated with TBILFAC. Thus, in the various models examined in this study, only the forecasted annual change in CPI (FCPIGR) variable is included to study its impact on PE ratio of a firm.

The empirical results of various models are shown in Table 1 to Table 3. To avoid multi-collinearity problem, each model has some common variables, and one of the various financial risk variables (such as LTDTTD, LTDTAST, TDTAST along with its square terms), and either sales (LNSALES) or size (LNMV) variable. Thus, for example, Models 1 to 3 differ as these employ firms' different financial risk measures one at a time, and include size variable instead of sales variable. However, Models 4 to 6 differ as these employ firm's different financial risk variable one at a time, but include sales instead of size variable. Thus, each model has no multi-collinearity problem.

In each model, VIFs (Variance Inflation Factors) for various variables without quadratic terms are less than 6 confirming no multi-collinearity problem among independent variables.[8] The VIFs are shown against each variable for each model in Tables 1 to 3. For each variable, t-value is also shown in parenthesis below its B coefficient value.

Various transformations of the dependent variable, price to earnings ratio are examined to test for heteroskedasticity problem, and possibly to find a model that does not have this problem, and thus can best explain the phenomenon under study. This problem is analyzed in various models by examining the plots of residuals with their predicted values. The inverse transformation (earnings to price WSEP ratio) is found most suitable and is found to have no heteroscedasticity problem. The plots of the residuals of inverse models with and without quadratic terms are found randomly distributed with no trends, suggesting that the error terms have constant variance for all levels of independent variables. However, the best residual plots are found to be of the inverse models with quadratic terms. Thus, the results are analyzed from these inverse models. In each model from Table 1 to Table 3, the inverse of price to earnings (that is earnings to price WSEP) ratio is the dependent variable. Because all other models including PE as dependent variable had heteroskedasticity problem, thus, these models are not included.[9]

In short, all these various models incorporate industry-type variables, forecasted EPS growth rates of firms by VLIS, various firms' specific variables, and the macroeconomic variable FCPIGR.

EARNINGS TO PRICE (EP) RATIO MODELS

Table 1: Inverse Models (Dependent Variable: 1/Wspe = Wsep)

Variables	MODEL 1 β	VIF	MODEL 2 β	VIF
CONSTANT	8.778E-02 (3.320)***		8.800E-02 (3.081)***	
FWATAS	2.339E-02 (0.819)	(16.191)	2.075E-02 (0.708)	(16.142)
FWATASQ	-2.29E-02 (-1.308)	(10.640)	-2.20E-02 (-1.229)	(10.610)
LTDTTD				
LTDTTDSQ				
LTDTAST	-0.119 (-1.996)**	(13.009)		
LTDTASTSQ	0.268 (2.137)**	(12.281)		
TDTAST			-8.85E-02 (-1.349)	(15.315)
TDTASTSQ			0.163 (1.325)	(15.076)
LNMV	-7.24E-03 (-2.029)**	(1.415)	-6.82E-03 (-1.800)*	(1.451)
LNSALES				
EPSTGR	-4.29E-04 (-4.427)***	(1.692)	-4.10E-4 (-4.198)***	(1.642)
INDTYPE1	-6.79E-03 (-.907)	(3.001)	-8.02E-03 (-1.068)	(2.871)
INDTYPE2	-2.48E-02 (-2.708)***	(3.562)	-2.64E-02 (-2.750)***	(3.721)
INDTYPE3	-4.43E-02 (-3.353)***	(2.168)	-4.44E-02 (-3.240)***	(2.218)
INDTYPE4	-1.55E-02 (-1.663)*	(4.492)	-1.66E-02 (-1.729)*	(4.381)
FCPIGR	7.600E-03 (1.175)	(1.074)	7.616E-03 (1.141)	(1.079)

Note:

$R^2 = 0.526$ $R^2 = 0.509$
Adj. $R^2 = 0.457$ Adj. $R^2 = 0.437$
F = 7.668   F = 7.068
Durban Watson d = 1.83   Durban Watson d = 1.84

*Significant at 90% level
**Significant at 95% level
***Significant at 99% level

Source: Author

Table 2: Inverse Models (Dependent Variable: 1/Wspe = Wsep)

Variables	MODEL 3 β	VIF	MODEL 4 β	VIF
CONSTANT	7.796E-02 (2.884)***		7.700E-02 (2.920)***	
FWATAS	1.795E-02 (.609)	(16.290)	1.929E-02 (.664)	(16.091)
FWATASQ	-2.12E-02 (-1.171)	(10.813)	-2.11E-02 (-1.186)	(10.617)
LTDTTD	-3.64E-03 (-.094)	(15.978)		
LTDTTDSQ	8.396E-04 (.028)	(16.201)		
LTDTAST			-0.109 (-1.802)*	(12.884)
LTDTASTSQ			0.260 (2.032)**	(12.290)
TSTAST				
TDTASTSQ				
LNMV	-6.65E-03 (-1.799)*	(1.434)		
LNSALES			-3.88E-03 (-1.059)	(1.544)
EPSTGR	-4.06E-04 (-4.266)***	(1.542)	-3.92E-04 (-4.043)***	(1.631)
INDTYPE1	-9.20E-03 (-1.349)	(2.353)	-8.05E-03 (-0.997)	(3.369)
INDTYPE2	-2.68E-02 (-3.305)***	(2.639)	-2.43E-02 (-2.605)**	(3.568)
INDTYPE3	-4.15E-02 (-3.097)***	(2.102)	-4.72E-02 (-3.522)***	(2.146)
INDTYPE4	-1.66E-02 (-1.957)*	(3.515)	-1.56E-02 (-1.621)	(4.604)
FCPIGR	8.703E-02 (1.308)	(1.073)	7.450E-03 (1.120)	(1.092)

Note:

$R^2 = 0.498$
Adj. $R^2 = 0.425$
F = 6.852
Durban Watson d = 1.83

$R^2 = 0.508$
Adj. $R^2 = 0.436$
F = 7.123
Durban Watson d = 1.84

*Significant at 90% level
**Significant at 95% level
***Significant at 99% level

Source: Author

Table 3: Inverse Models (Dependent Variable: 1/Wspe = Wsep)

Variables	MODEL 5 B	VIF	MODEL 6 B	VIF
CONSTANT	7.587E-02 (2.680)***		6.981E-02 (2.571)***	
FWATAS	1.681E-02 (0.566)	(16.032)	1.466E-02 (0.490)	(16.244)
FWATASQ	-2.02E-02 (-1.112)	(10.576)	-1.99E-02 (-1.080)	(10.825)
LTDTTD			-8.33E-03 (-0.210)	(16.221)
LTDTTDSQ			5.330E-04 (0.172)	(16.379)
LTDTAST				
LTDTASTSQ				
TSTAST	-8.21E-02 (-1.234)	(15.259)		
TDTASTSQ	0.163 (1.296)	(15.093)		
LNMV				
LNSALES	-3.14E-03 (-0.814)	(1.575)	-3.13E-03 (-0.818)	(1.600)
EPSTGR	-3.70E-04 (-3.820)***	(1.563)	-3.63E-04 (-3.892)***	(1.436)
INDTYPE1	-9.80E-03 (-1.213)	(3.214)	-1.14E-02 (-1.586)	(2.551)
INDTYPE2	-2.59E-02 (-2.653)**	(3.725)	-2.74E-02 (-3.328)***	(2.634)
INDTYPE3	-4.71E-02 (-3.400)***	(2.193)	-4.49E-02 (-3.327)**	(2.064)
INDTYPE4	-1.72E-02 (-1.746)*	(4.498)	-1.79E-02 (-2.075)**	(3.544)
FCPIGR	7.585E-03 (1.109)	(1.095)	8.407E-03 (1.232)	(1.092)

Note:

$R^2 = 0.492$	$R^2 = 0.481$
Adj. $R^2 = 0.418$	Adj. $R^2 = 0.406$
F = 6.611	F = 6.406
Durban Watson d = 1.83	Durban Watson d = 1.84

*Significant at 90% level
**Significant at 95% level
***Significant at 99% level

Source: Author

ANALYSIS

In the following portion of this section, the results are analyzed from earnings to price ratio (inverse) model with quadratic terms (as this model is found to have no heteroscedasticity problem), and then converted to analyze for price to earnings ratio with the logic that in case earnings to price ratio of a firm increases, its price to earnings ratio decreases and vice versa. The PE ratio models are not used for analysis purposes as these had heteroskedasticity problem as stated earlier. All the models exhibit no first-order auto-correlation at 0.01 level of significance as the Durban-Watson test statistic d lies between 1.83 and 1.84.

Long-term debt to total assets (LTDTAST), and square of long-term debt to total assets (LTDTASTSQ) are found significant in all the models in which these financial risk variables are employed. The coefficient of LTDTAST is found negative and significant. However, the coefficient of LTDTASTSQ is found positive and

significant.[10]

This implies that holding everything else constant, as the type of financial risk in the form of higher long-term debt to total assets of a firm increases, the EP ratio of that firm decreases up to a certain long-term debt level, reaches a minimum value, and then increases as shown in Figure 1. This, in turn, implies that as the long-term debt level with respect to total assets of a firm increases, the PE ratio of that firm increases, reaches maximum, and afterwards decreases or falls down with the further increase of such financial leverage of the firm. (Figure 2).
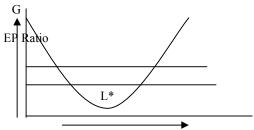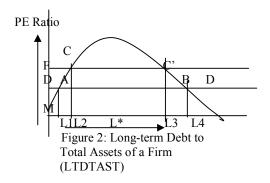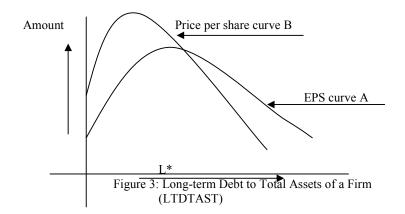
Figure 1: Long-term Debt to
Total Assets of a Firm
(LTDTAST)

Figure 2: Long-term Debt to
Total Assets of a Firm
(LTDTAST)

Figure 3: Long-term Debt to Total Assets of a Firm
(LTDTAST)

Thus, the PE ratio curve with respect to this financial risk variable (LTDTAST) is found concave downwards. In other words, PE ratio of a firm is found not to decrease monotonically with the increase in the above-mentioned financial risk variable as hypothesized earlier in this paper. The empirical results for this ratio with respect to long-term debt to total assets of a firm are found similar to the controversial theoretical notions of PE ratio provided by Kolb (1995).[11]

The Figure 2 illustrates that at higher financial risk L2 than risk L1, the PE ratio of a firm is higher as shown at F than D. On the other hand, at still higher financial risk L4 than risk L3, this ratio of the firm is lower as shown

at D than F. Thus, a low PE level does not necessarily imply higher risk and vice-versa.

The results further indicate that for a certain PE value of a firm, the firm may have either low financial risk, or high financial risk in the form of long-term debt to total assets. A horizontal line drawn for a PE ratio of value D would intersect such a concave curve at two points A and B at two possible long-term debt levels with respect to total assets, L1 and L4. (Figure 2)

Thus, the results indicate that a firm with a low PE ratio does not necessarily mean a firm with high financial risk as implied from the prevailing general notion about this ratio. According to this study, a relatively low PE ratio firm may have either low financial risk (say at L1) and possibly a good investment candidate, or may have high financial risk (say at L4) and possibly not a good investment candidate.

One possible explanation for the concave curve of PE ratio can be that the earnings per share (EPS) and price per share follow the patterns shown by curves A and B respectively in Figure 3. These curves, as earlier stated, have been well mentioned in textbooks, say by Brigham and Houston (2002)[12]. Thus, with the financial leverage up to a certain level L* with increasing EPS, the investors' irrational enthusiasm and exuberance seems to cause the price of the stock to rise at a rate faster than the rate at which its EPS rises. The irrational exuberance has been mentioned by US Federal Reserve Chairman Alan Greenspan many times in his speeches. For example, in December 1996, he asked a widely reported question that sent the market temporarily plummeting: " How do we know when irrational exuberance has unduly escalated asset values?."

Similarly, near that debt level L*, when the EPS starts falling, the investors' irrational pessimism seems to cause decline in the price of the stock at a rate faster than the rate at which EPS falls. Thus, close to debt level L*, the stock price of the firm increases, reaches maximum, and after that it falls down, and thus follows a concave curve B as shown in Figure 3. Combining earnings per share (EPS) and price per share together, the PE ratio can follow a concave pattern as exhibited in Figure 2, and this pattern is found empirically in this study.

Moreover, another interesting observation from this study is that the alternate financial risk variables such as total debt to total assets (TDTAST), long-term debt to total debt (LTDTTD), and their respective quadratic terms are found to have no significant impact on a firm's PE ratio as depicted in all the alternate models having these financial risk variables such as in Models 2, 5, and 3, 6 respectively.

Thus, in short, from this study, only significant financial risk variable of a firm found is interest-bearing long-term debt to total assets (LTDTAST), and other financial risk measures such as long-term debt to total debt (LTDTTD) and total debt to total assets (TDTAST) are found insignificant.
Similarly, business risk in the form of operating leverage, or fixed costs of a firm viz. both net fixed assets including work-in-progress if any, to total assets (FWATAS), and square of net fixed assets including work-in-progress if any, to total assets (FWATASQ) are found to have insignificant impact on a firm's EP ratio, and in turn on its PE ratio. Thus, PE ratio of a firm is found not to decrease monotonically with the increase in its operating leverage as earlier hypothesized in this paper. The higher level of fixed assets investment is a sunk cost, and is found to be seen by investors as irrelevant as far as the firm's risk , and related PE ratio are concerned.

Furthermore, in all the models, a variable that is also found to significantly affect the EP ratio of a firm, and thus in turn its PE ratio is firm's forecasted annual growth rate of earnings per share for next year (EPSTGR) as provided by Value Line Investment Survey. Higher this forecast for a firm, lower its EP ratio, and higher its PE ratio. However, the magnitude though found negative is relatively quite small (not more than -3.63 E-04 in all the models) as compared to the magnitudes of other variables in the models analyzed. The explanation of negative sign of the coefficient with respect to EP ratio, and overall positive effect of this variable with respect to PE ratio is provided in note. [13]

The results also indicate that among type of industries studied, EP ratio of firms are highest for firms in electric utility industry (INDTYPE 5) followed by firms in capital goods industry (INDTYPE 4), consumer durables industry (INDTYPE 2), consumer staples industry (INDTYPE 3), and basic materials / energy industry (INDTYPE 1) in that order.[14] Though the magnitude of coefficient for firms in basic materials / energy industry (INDTYPE 1) such as petroleum and / or natural gas is found quite high for their EP ratio, it is found insignificant in all the models studied in the paper. Thus, in this paper, this industry is not further analyzed relating to impact of industry types on PE ratios of their firms.

However, PE values are found to be highest for firms in consumer staples industry (INDTYPE 3) such as

medical, followed by firms in consumer durable industry (INDTYPE 2) such as chemical, firms in capital goods industry (INDTYPE 4) such as manufacturing /manufacturing steel, and aerospace, and then firms in electric utility industry (INDTYPE 5) in that order. This is because from the models, EP values are found to be lowest for firms in consumer staples industry (INDTYPE 3), followed by firms in consumer durable industry (INDTYPE 2), and then firms in capital goods industry (INDTYPE 4). Thus, in short, the type of industry to which a firm belongs to has, on average, a significant effect on its PE ratio.

Furthermore, the size of a firm (LNMV) is found to have a significant impact on its EP ratio, and thus on its PE ratio in all the models with this variable. The coefficient of this variable is found negative and significant. It implies that the higher the size of a firm, the lower its EP ratio, and the higher its PE ratio.

However, the size of firms (LNMV) is found to be closely related to the sales of the firm (LNSALES) implying the higher the size of the firm, the higher its sales. However, the sales per se is found to have an insignificant impact on this market-based ratio in all the models with this variable. The volume of sales of a firm alone does not seem to give any clear-cut indication of the future profitability and expectations of firms' earnings growth to the investors. In all the models, the variable forecasted annual change in CPI (FCPIGR) is also found insignificant.

CONCLUSIONS

This study delineates a specific type of financial risk (long-term debt to total assets) of a firm that affects its PE ratio. It provides an empirical evidence for the non-monotonic decrease of this ratio with the increase of this financial risk of the firm. The study also shows the non-linearity effect of this risk on the ratio. It provides an evidence that a firm with low PE does not necessarily imply a firm with higher financial risk and vice-versa. Thus, it helps in explaining why, on average, the prevalence of general out-performance of low PE stocks as compared to high PE stocks as these stocks may not necessarily be the stocks of firms with high financial risk, and thus this factor may contribute towards their performance.

It also provides evidence against the monotonic decrease of this ratio with the increasing business risk in the form of operating leverage of a firm, and evidence for the significant effect on this ratio, on average, by the type of industry to which a firm belongs. The study confirms the effect of firm's forecasted annual growth rate of earnings per share on this ratio as found in earlier studies. It also suggests that the higher the size of the firm, the lower is this ratio. The paper also confirms the usefulness of analyzing EP ratios as compared to PE ratios. However, no evidence for the significant impact of sales of a firm and forecasted annual change in price index on this ratio is found in this study.

LIMITATIONS OF THE STUDY

The findings are limited to the year-end values of firms with positive earnings for the period under study. However, this empirical study is a step towards providing significant insights in to the existing conflicting literature on the effect of fundamental measures of risk such as financial and operating leverages of a firm on its PE ratio. However, the author would recommend further research of the effect of business and financial risks on PE ratios of firms in various industries for more insight in to the phenomenon.

NOTES

1. The effect of the industry type 5 on this ratio can be determined from the constant (s) in the models.
2. Most of the firms had net fixed assets with no work-in progress. However, some firms, especially in Electric Utility industry had net fixed assets with work-in progress. Thus, variable fixed assets including work-in-progress, if any to total assets (FWATAS) is included in the various models for analysis purposes.
3. This rigorous way is employed in this study to analyze the effects of alternate financial risk measures besides using a financial risk measure such as total debt to total assets for that purpose.
4. Size of a firm is defined as market value of its equity at 31st December of each year. In this study, logarithm to the base 10 is used for both Log of market value (LNMV) and Log of sales (LNSALES) values of a firm. Natural logarithm of market value has been found to yield linear relationship (Brown et al. (1983)). However, it can be easily shown that a variable that is linear in natural logarithm is also linear in logarithm to the base 10. The proof is shown below:

$$\text{Log}_e{}^x = \text{Log}_{10}{}^x / \text{Log}_{10}{}^e = \text{Log}_{10}{}^x / 0.43429$$
$$\text{or } \text{Log}_e{}^x = \text{Log}_{10}{}^x / \text{constant}$$

Thus, if $z = a + b * Log_e^x$ (Linear relationship)
then, $z = a + b' * Log_{10}^x$ (Still a Linear relationship)

where a, b, and b' are the constants, b' = b / 0.43429, and z and x are dependent and independent variables respectively.

5.   Logarithm of sales has also been used in linear form in an earlier study by Rajan et al. (1995). Total number of shares outstanding of a firm are at the end of each year, that is December 31.

6.   Forecasted growth rate in earnings per share at time (t+1) for a firm =

$$\frac{\text{Forecast of EPS for year (t +1) - Reported EPS for year t.}}{\text{Reported EPS for year t}}$$

with reported EPS for year t > 0

Both forecasted EPS and reported EPS are the figures published by VLIS. The formula for forecast growth rate in earnings is the same as used in earlier study by Elton et al. (1981).

7.   Forecasted annual changes in 3 month T-bill rate, industrial production, and consumer price index (CPI) are used to analyze their impact on the future earnings growth of a firm. These macro variables are chosen because changes in interest rates, according to liquidity preference approach to the demand for money, are related to these variables. See Bae (1990), and Mishkin (1982). Industrial production is used as a proxy for real income, and CPI is used rather than GNP deflator to calculate the inflation variable as these proxies were suggested in an earlier study by Mishkin (1982). Similarly, annual change in 3-month T-bill rate is used as a reasonable proxy for the effect of money supply on interest rates.

8.   A more formal method for detecting a multi-collinearity problem among independent variables involves the calculation of variation inflation factors for individual parameters. Various authors have maintained that a severe multi-collinearity problem exists if the largest of the variance inflation factors for the B coefficient's is greater than 10. In this study, no variable has a VIF greater than 6. For further reference, see Mendenhall and Sincich (1986). In the models, the VIFs of variables having quadratic terms are more than 6.0. This is expected as square of a variable is highly correlated to the variable itself. However, all inverse models without quadratic terms have VIFs less than 6.0, and have no multi-collinearity problem among them.

9.   In the 'Full' model having all the variables, the VIFs of certain variables are found higher than 10 (For some variables, VIFs were quite high up to 162).

10.   Only the inverse models with quadratic terms are analyzed further in order to examine the non-linearity relationship of business risk and financial risk of a firm on its PE ratio. The plots of residuals of various other models are found non-random, and are not analyzed further. For example, plots of residuals of the linear models with and without quadratic terms of business risk and financial risk variables against PE ratio as the dependent variable, and the semi-log models with and without quadratic terms of business and financial risk variables against log of PE ratio as the dependent variable are found to be non-random, Thus, these models are not analyzed further.

11.   Holding every other variable(s) constant, the signs of LTDTAST and LTDTASTSQ indicate the conditions of existence of a minima for the EP ratio of a firm, and, in turn, maxima for its PE ratio. The reason is that second-order differentiation of EP ratio with respect to the variable LTDTAST from the relationship as shown in various models gives a positive sign which is a necessary and sufficient condition for a minima to exist. Thus, it further implies an existence of maxima for PE ratio with respect to these variables.

The relationship for EP ratio can be written as

$EP = \text{Constant} + b * LTDTAST + c * LTDTAST^2 + \text{Error term}$
where b is found to be negative, and c is found to be positive in inverse models with quadratic terms.

Therefore, $d^2 EP/d\ LTDTAST^2 = 2* c = + \text{ive value}$

12.   See Brigham E. and J. Houston (2002) on Capital Structure and Leverage, pp. 616.

13.   Holding every other variable(s) constant, the EP relationship with respect to growth rate in earnings per share can be written as

$EP = \text{Constant} + a * EPSTGR + \text{Error term}$
where constant has a + ive sign and 'a' has - ive sign as found from the models.

Thus, as EPSTGR increases, EP decreases, PE increases, and vice-versa.

14.   Holding every other variable(s) constant, the EP relationship with respect to type of industry can be written as EP = Constant + a * INDTYPE # + Error term where constant has a + ive sign, the coefficient 'a' has - ive sign as found for all the industries except industry type 5 , and INDTYPE # represents industry type number. The four dummy variables have been used for four different industries. However, the value of the constant reflects the coefficient for Industry type 5 (1NDTYPE 5). Thus, as magnitude of coefficient 'a' increases for any industry other than industry type 5, its impact reduces EP of a firm in that industry, and correspondingly increases PE of the firm, and vice versa.

REFERENCES

Aggarwal, R., R. P. Rao, and Hiraki T. (1990). Regularities in Tokyo Stock Exchange Security Returns: P/E, Size, and Seasonal Influences. *The Journal of Financial Research*, Fall, pp. 249-63.

Abarbanell J. S. (1991). Do Analysts' Earnings Forecasts Incorporate Information in Prior Stock Price Changes? *Journal of Accounting and Economics* 14, pp.147-66.

Abarbanell, J. S., and Bernard V. L.(1992). Tests of Analysts' Overreaction / Under-reaction to Earnings Information as an Explanation for Anomalous Stock Price Behavior. *Journal of Finance* 47, pp.1181-1207.

Bae S. C (1990). Interest Rate Changes and Common Stock Returns of Financial Institutions: Revisited. *The Journal of Financial Research*, pp. 71-79.

Banz R.W. (1981). The Relationship Between Return and Market Value of Common Stocks. *Journal of Financial Economics* 9, pp. 3-18.

Basu S. (1983). The Relationship Between Earnings Yield, Market Value and Return for NYSE Common Stocks: Further Evidence. *Journal of Financial Economics* 12, pp.129-56.

Brigham E. and Houston J. (2002). *Fundamentals of Financial Management*, Concise 3rd Ed., South-Western Thomson Learning Publishers.

Brown, L. D. (1993). Earnings Forecasting Research: Its Implications for Capital Market Research. *International Journal of Forecasting* 9, pp. 295-320.

Brown P., A. Kleidon, and Marsh T. (1983). New Evidence on the Nature of Size Related Anomalies in Stock Prices. *Journal of Financial Economics* 12, pp. 33-56.

Capstaff J., K. Paudyal, and Rees W. (1995). The Accuracy and Rationality of Earnings Forecasts by UK Analysts. *Journal of Business Finance and Accounting* 22 (I), January, pp. 67-85.

Cho, Y. J. (1994). Determinants of Earnings-Price Ratios: A Reexamination. *Review of Financial Economics,* Vol. 3, No. 2, Spring, pp. 105-120.

Elton J. E., M. J. Gruber, and Gultekin M. (1981). Expectations and Share Prices. *Management Science,* September, pp. 975-87.

Fischer D. E., and Jordan R. J. (1983). *Security Analysis and Portfolio Management*, pp. 545, Prentice Hall International Inc., Englewood Cliffs, N.J.

Givoly D. (1985). The Formation of Earnings Expectation. *The Accounting Review*, July, pp. 372-86.

Harris M. and Raviv A. (1990a). Capital Structure and Informational Role of Debt. *Journal of Finance*, pp. 321-49.

Kolb, R. W. (1995). *Investments*, 4th Edition, pp. 393-4 Kolb Publishing Company Inc., Boulder, CO 80301

Lang L. E. Ofek and Stulz P.M. (1996). Leverage, Investment, and Firm Growth. *Journal of Financial Economics* 40, pp. 3--29.

Levy H., and Lerman Z. (1985). Testing P/E Ratio Filters with Stochastic Dominance. *Journal of Portfolio Management* 11, pp. 31-41.

Lie E., and Lie H. J. (2002). Multiples Used to Estimate Corporate Value. *Financial Analysts Journal* (March / April), pp. 44-54.

Mendenhall W., and Sincich T. (1986). *A Second Course in Business, Statistics: Regression Analysis*, San Francisco: Dellen (Macmillan).

Mishkin, F. S. (1982). The Real Interest Rate: An Empirical Investigation. *NBER Reprints* 0243, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue Cambridge, MA 02138.

Moyer, R. C., J. R. Mcguigan, and Kretlow W. J. (1998). *Contemporary Financial Management*, South-Western College Publishing, Cincinnati/ Ohio

Nomura Securities and Dorfman J. R. (1994). Why Investors Fear Inflation: Investors' Jitters on Inflation Aren't Spooking Most Advisors. *Wall Street Journal* (Sept. 14), pp. C1, C3.

Pearce, D. K. and Roley V. V. (1988). Firm Characteristics, Unanticipated Inflation, and Stock Returns. *The Journal of Finance*, pp. 965-81.

Philbrick, D. R., and Ricks W. E. (1991). Using Value Line and IBES Analyst Forecasts in Accounting Research. *Journal of Accounting Research (*Autumn), pp. 397-417.

Frank K. R., and Norton E. A. (1995). *Investments,* 18, The Dryden Press / Harcourt Brace College Publishers / Orlando, FL.

Rajan R. G. and Zingales L. (1995). What Do We Know About Capital Structure? Some Evidence From International Data. *Journal of Finance,* 5, pp. 1421-60.

Reinganum, M. (1981). Mis-specification of Capital Asset Pricing: Empirical Anomalies based on Earnings Yields and Market Values. *Journal of Financial Economics,* 9, pp. 19-46.

Stoll, H. R., and Whaley R. E. (1983). Transaction Costs and the Small Firm Effect. *Journal of Financial Economics,* 12, pp. 57-79.

Stulz R. (1990). Managerial Discretion and Optimal Financing Policies. *Journal of Financial Economics,* 26, pp. 3-27

Thomson II, J. (1976). Sources of Systematic Risk in Common Stocks, *Journal of Business,* 49, no. 2 (April)

Zarowin P. (1990). What determines Earnings-Price Ratios: Revisited. *Journal of Accounting, Auditing, & Finance*, vol.5, no.3, Summer, pp.439-457.

Malaysian Second Board Stocks Do Not Follow Random Walk:
Evidence from the BDS Test

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ABSTRACT

This study examines the price behaviour of stocks traded on the Second Board of Kuala Lumpur Stock Exchange in light of the random walk hypothesis. With a new and powerful statistical tool, namely the Brock-Dechert-Scheinkman (BDS) test, it is possible to detect a more complex form of dependencies in series of financial returns that often appear completely random to standard statistical tests, such as serial correlation tests, non-parametric runs test, variance ratio test and unit root tests. The BDS test results reveal that all the Second Board stocks under study do not follow a random walk process. This conclusion holds even when the sample period is broken down into four meaningful sub-periods.

INTRODUCTION

The efficient market hypothesis (EMH) introduced three decades ago was a major intellectual advance and reached its height of dominance in academic circles around the 1970s. Nowadays, it remains as one of the major building blocks of modern finance, evidenced by its inclusion in most finance and financial economics textbooks. Empirically, a great deal of research has been devoted over the years to examine the efficiency of stock market price formation, both in developed and emerging stock markets. The phenomenal growth in this body of literature is partly due to the concern and interest of financial economists and investment communities on the predictability of stock prices. Within this framework, the random walk theory of stock prices, which postulates that future price movements cannot be predicted from historical sequence of stock prices, has been widely employed to test the efficiency of stock market, particularly in the context of weak-form efficiency. As McInish and Puglisi (1982) pointed out, a sufficient condition for weak form efficiency is that stock price fluctuates randomly. As a result, a market is efficient in the weak form if stock prices follow a random walk process. The justification is that in an efficient market, new information is deemed to come in a random fashion, thus changes in prices that occur as a consequence of that information will seem random. Therefore, price movements in a weak-form efficient market occur randomly and successive price changes are independent of one another.

Over the past two decades, the efficiency of the Kuala Lumpur Stock Exchange (KLSE) of Malaysia has received considerable attention from researchers. Generally, the empirical evidence reported indicates that the market is weak-form efficient, for instance, Barnes (1986), Laurence (1986), Saw and Tan (1989), Annuar *et al.* (1991, 1993), Kok and Lee (1994) and Kok and Goh (1995), just to name a few. However, empirical evidence of inefficiency cannot be suppressed, which is documented in Yong (1989, 1993). Another recent study by Lai *et al.* (2003) using the variance ratio test also reveals the non-randomness of successive price changes in the KLSE.

Though the empirical results on the KLSE are mixed, one notable similarity of all the aforementioned studies is the application of standard statistical tests- serial correlation test, runs test, variance ratio test and unit root tests, to uncover linear serial dependencies or autocorrelation in the data. Specifically, in testing for independence, the standard statistical tests employed are designed to uncover linear dependencies in the data. However, the lack of linear dependencies does not imply that the series are random as there might be other more complex forms of dependencies which cannot be detected by these standard methodologies. Even Fama (1965: 80) admitted that linear modelling techniques have limitations, as they are not sophisticated enough to capture complicated 'patterns' that the chartist sees in stock prices. Steurer (1995: 202) expressed similar opinion, in which he argued that there is an order to the apparent randomness of the market. This order is so complex that the random

walk concept is proven by the standard linear statistical tests. Another researcher, Brooks (1996: 307) agreed that series of financial returns often appear completely random to standard linear and spectral tests. However, the author strongly believed that if a different approach, using more powerful techniques, it may be possible to uncover a more complex form of dependencies in these series.

One of the possibilities that might contribute to the departure from random walk is the presence of non-linear serial dependencies in the underlying data generating process (DGP). Even the influential paper of Fama (1970: 394) acknowledged this possibility: "*Moreover, zero covariances are consistent with a fair game model, but as noted earlier, there are other types of nonlinear dependence that imply the existence of profitable trading systems, and yet do not imply nonzero serial covariances*". In this regard, Hinich and Patterson (1985) is the first published paper reporting evidence of non-linearity in common stock returns. As recalled by Patterson and Ashley (2000), the original manuscript of Hinich and Patterson (1985) met with resistance from the finance journals because finance academics were reluctant at that time to recognize the importance of distinguishing serial correlation from non-linear serial dependencies. Subsequent evidence documented in Scheinkman and LeBaron (1989), Hsieh (1991), Abhyankar *et al*. (1995), Opong *et al*. (1999) and Ammermann and Patterson (2003) strongly suggest that non-linearity is a cross-sectionally universal phenomenon.

The evidence of non-linearity has strong implication on the weak-form EMH for it implies the potential of predictability in financial returns. Specifically, if investors could have profitably operated a trading rule (net of all transactions costs) that exploits this detected non-linearity, it would be at odds with the weak-form EMH, which postulates that even non-linear combinations of previous prices are not useful predictors of future prices (Brooks, 1996; Brooks and Hinich, 1999). However, Hsieh (1989) argued that the standard statistical tests such as serial correlation test, runs test, variance ratio test and unit root tests may fail to detect non-linear departure from the random walk hypothesis. In this regard, those earlier KLSE studies in favour of EMH might have drawn incorrect inferences or even policy recommendations since they have implicitly disregarded the presence of non-linearity[1].

Motivated by the above concern that the underlying process might be governed by non-linearity, coupled with the recent breakthroughs pertaining to non-linear dynamics, Lim *et al*. (2003) re-examined the random walk hypothesis using the Brock-Dechert-Scheinkman (BDS) test, which has been widely employed in the literature (see, for example, Hsieh, 1989, 1991; Scheinkman and LeBaron, 1989; Steurer, 1995; Brooks, 1996; Al-Loughani and Chappell, 1997; Opong *et al*., 1999; Serletis and Shintani, 2003). The BDS test developed in Brock *et al*. (1987, 1996) has been proven to be quite powerful in detecting departures from i.i.d. behaviour in some Monte Carlo simulations (see, for example, Brock *et al*., 1991; Hsieh, 1991). In particular, the test has good power to detect at least four types of non-i.i.d. behaviour: non-stationarity, linear dependencies, non-linear stochastic process and non-linear deterministic process. Using data of KLSE Composite Index, Lim *et al*. (2003) found the inadequacy of random walk model to describe the price behaviour of KLSE since some cycles or patterns show up more frequently than would be expected in a true random series.

In the random walk literature on KLSE reported thus far, most of the studies investigated the price behaviour of stocks traded on the Main Board, either using data of stock indices or individual stocks. Only Kok and Lee (1994) showed interest on the Malaysian Second Board stock market, which was established on 11 November 1988 to allow companies with more than RM5 million but less than RM20 million paid-up capital and a reasonably good profit track record to be listed on the KLSE[2]. This is not surprising because even investors have shown more interest on stocks traded on the Main Board. As a result, Second Board stocks are not only smaller in market size, but also thinly traded. However, the Second Board provides an avenue to empirically investigate the price behaviour of smaller stocks in a thinly traded market.

On *a priori* basis, one would expect smaller stocks characterized by thin trading to exhibit non-randomness in the price behaviour. This is because market efficiency depends partly on the presence of a large number of traders and active trading. As indicated in Barnes (1986), market thinness (low volume of trading) makes it difficult for traders to react to new information and therefore prices to reflect it. This means, a thin market does not fully reflect the actual information which is random in nature, and therefore the price changes are not random. Annuar and Shamsher (1993) concurred with this view, explaining that inactivity slows the speed of adjustment and prices may not react fully to changes in available information, thus introducing potential sources of inefficiency. Apart from the reaction of prices to the arrival of new information, alternative justification has been offered on the grounds of arbitrage activities. For instance, Brooks (1996) argued that the closer and detailed inspection by traders and analysts should ensure that the patterns detected are quickly arbitraged away,

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[1] Liew *et al*. (2003) demonstrated that the conventional diagnostic tests are unable to identify the inadequacy of linear model for most of the Asian real exchange rates under study. In this case, using a mis-specified linear model will result in incorrect inferences and wrong clues in policy matters.

[2] The Second Board listing requirements have undergone some revisions over the years and interested readers can obtain the latest updates from the KLSE official website at http://www.klse.com.my/ .

hence contributing to the random walk movement of widely traded stocks. However, this does not apply to thinly traded stocks, as contained in Dockery and Kavussanos (1996: 123): "*Moreover, given the thinness of the ASM, it is more likely that attempts by traders to exploit any information about future prices contained in past price data may not be worth the effort. For it may be the case that only a small number of shares can be brought on the market before stock prices are influenced by the actual buying and selling of shares which may then give rise to further fluctuations in share prices. As a result, stock prices are likely to demonstrate a greater degree on non-randomness simply because market traders are unable to remove it*". Against prior expectations, Kok and Lee (1994) found that the Malaysian Second Board market is generally a weak form efficient market, which the authors attributed to the increased sophistication and technological advancement in the communication system over the sample period examined. However, due to the limitations of standard statistical tests employed by Kok and Lee (1994), it would certainly warrant further investigation on the robustness of this previous finding, using the more robust BDS test as employed by Lim *et al.* (2003). The present study also contributes to broaden the existing random walk literature on KLSE to include the Second Board stock market.

In the following section, this paper provides a brief description of the BDS test. Section III discusses the data used in this study. Section IV presents the empirical results as well as the analysis of the findings. Finally, concluding remarks are given at the end of the paper.

BROCK-DECHERT-SCHEINKMAN (BDS) TEST

Brock, Dechert and Scheinkman (Brock *et al.*, 1987) developed a statistical test and the BDS statistic. The original BDS paper took the concept of the correlation integral and transformed it into a formal test statistic which is asymptotically distributed as a normal variable under the null hypothesis of independent and identically distributed (i.i.d.) against an unspecified alternative. In principle, no distributional assumption on the underlying data generating process is needed in using the BDS test as a test statistic for i.i.d. random variables. Though the estimation is non-parametric, the test statistic is asymptotically distributed as a standard normal variable, with zero mean and unit variance. Hence, the significance of the test statistic is readily determined from standard normal tables. A revision of this original paper has been done in Brock *et al.* (1996).

The BDS test is based on the correlation integral as the test statistic. Given a sample of i.i.d. observations, $\{x_t: t = 1, 2, \ldots, n\}$, Brock *et al.* (1987, 1996) showed that:

$$W_{m,n}(\varepsilon) = \sqrt{n}\, \frac{T_{m,n}(\varepsilon)}{V_{m,n}(\varepsilon)} \tag{1}$$

has a limiting standard normal distribution, where $W_{m,n}(\varepsilon)$ is the BDS statistic. n is the sample size, m is the embedding dimension, and the metric bound, ε, is the maximum difference between pairs of observations counted in computing the correlation integral. $T_{m,n}(\varepsilon)$ measures the difference between the dispersion of the observed data series in a number of spaces with the dispersion that an i.i.d. process would generate in these same spaces, that is $C_{m,n}(\varepsilon) - C_{1,n}(\varepsilon)^m$. $T_{m,n}(\varepsilon)$ has an asymptotic normal distribution with zero mean and variance $V^2_m(\varepsilon)$.

This BDS test has an intuitive explanation. The correlation integral $C_{m,n}(\varepsilon)$ is an estimate of the probability that the distance between any two m-histories, $x_t^m = (x_t, x_{t+1}, \ldots, x_{t+m-1})$ and $x_s^m = (x_s, x_{s+1}, \ldots, x_{s+m-1})$ of the series $\{x_t\}$ is less than ε, that is, $C_{m,n}(\varepsilon) \to \text{prob}\{|x_{t+i} - x_{s+i}| < \varepsilon,$ for all $i = 0, 1, \ldots, m-1\}$, as $n \to \infty$.

If the series $\{x_t\}$ are independent, then, for $|t-s| > m$, $C_{m,n}(\varepsilon) \to \prod_{i=0}^{m-1} \text{prob}\{|x_{t+i} - x_{s+i}| < \varepsilon\}$, as $n \to \infty$.

Furthermore, if the series $\{x_t\}$ are also identically distributed, then $C_{m,n}(\varepsilon) \to C_1(\varepsilon)^m$, as $n \to \infty$. The BDS statistic therefore tests the null hypothesis that $C_{m,n}(\varepsilon) = C_{1,n}(\varepsilon)^m$, which is the null hypothesis of i.i.d [3].

The need to choose the values of ε and m can be a complication in using the BDS test. For a given m, ε cannot be too small because $C_{m,n}(\varepsilon)$ will capture too few points. On the other hands, ε cannot be too large because $C_{m,n}(\varepsilon)$ will capture too many points. For this reason, we adopt the approach used by advocates of this test. In particular, we set ε as a proportion of standard deviation of the data, σ. Hsieh and LeBaron (1988a, b) have performed a number of Monte Carlo simulation tests regarding the size of the BDS statistics under the null of i.i.d. and the alternative hypotheses. The Monte Carlo evidence showed that the 'best' choice of ε is between 0.50 and 1.50 times the standard deviation.

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[3] The null of i.i.d. implies that $C_{m,n}(\varepsilon) = C_{1,n}(\varepsilon)^m$ but the converse is not true.

On the other hand, at our chosen setting of ε, we produce the BDS test statistics, $W_{m,n}(\varepsilon)$ for all settings of embedding dimension from 2 to 5. Though most researchers computed the BDS statistics for embedding dimension varying from 2 to 10 (see, for example, Hsieh, 1989; Brooks, 1996; Opong *et al.*, 1999), it is important to take note that the small samples properties of BDS test degrade as one increases the embedding dimension. Specifically, the Monte Carlo simulations in Brock *et al.* (1991) demonstrated that as the dimension goes beyond 5, the small samples properties of BDS degrade, mainly due to the reduction of non-overlapping observations as m grows. Thus, this study only computes the BDS test statistics for embedding dimensions of 2 to 5.

THE DATA

The data in this study consist of daily closing prices for individual stocks traded on the Second Board of Kuala Lumpur Stock Exchange (KLSE). However, due to data availability for the sub-periods analysis to be discussed later, only 12 component stocks as listed in Appendix are included in this sample study. All the data are collected from KLSE.

The justification for using individual stocks rather than the Second Board Index can be found in Fama (1965), who argued that the use of market index data in random walk tests may lead to a false perception of price change dependence even when price changes of individual stocks represented by the index are independent. This spurious dependence comes from the persistence of the effect of the market factor on stocks not trading coincidentally. Dockery and Kavussanos (1996: 121) shared similar view: "*Well known stock market anomalies, such as thin and non-synchronous trading and the size problem may also lead to spurious indications of return predictability in the general index*". Other critical comments can also be found in Campbell *et al.* (1997: 72): "*Individual returns contain much company-specific or idiosyncratic noise that makes it difficult to detect the presence of predictable components. Since the idiosyncratic noise is large attenuated by forming portfolios, we would expect to uncover the predictable systematic component more readily when securities are combined.*" Though it was claimed by Campbell *et al.* (1997) that such dependencies are difficult to detect in individual stocks, it remains a conjecture that require further empirical verification especially for smaller stocks traded in a thin market like the Second Board, as Granger (1975: 11) pointed out that the random walk hypothesis is "........ *only an 'average' kind of law, and may not hold true for all securities at all times*". Nevertheless, the choice of data is also motivated by the concern of some technical analysts who claimed that earlier efficiency studies on the KLSE are irrelevant because they use market indices rather than individual stocks (Dawson, 1990; Annuar *et al.*, 1991).

The prices covering the sample period from 1 January 1992 to 30 June 2002 are transformed into a series of continuously compounded percentage returns, using the relationship:

$$r_t = 100 * \ln(p_t / p_{t-1}) \tag{2}$$

where p_t is the closing price of the stock on day t, and p_{t-1} the price on the previous trading day.

This study first tests the random walk hypothesis over the whole sample period from 1 January 1992 to 30 June 2002. The study period is then broken down into four meaningful sub-periods for separate BDS test. The first sub-period starts from 1 January 1992 through 31 December 1994, similar to the sample period of Kok and Lee (1994). Aided by the coincidence that all the 12 stocks selected in the present study are also examined in Kok and Lee (1994), it is possible to determine the robustness of earlier findings reported by Kok and Lee (1994), in which it is surprising for a fairly thin Second Board stocks to exhibit high degree of efficiency in the weak form. Subsequently with the Asian financial crisis as the break point, the sample period is divided into three sub-periods: pre-crisis (1/1/1995-30/6/1997), crisis period (1/7/1997- 30/6/1999) and post-crisis (1/7/1999-30/6/2002).

The motivation for this sub-periods analysis is at least twofold. One, it is possible to determine whether the rejection of the random walk in the full sample is driven by the behaviour of stock prices in any particular sub-period. Similarly, the inability to reject random walk for the full sample could have masked significant result in any sub-period. Second, it would be interesting to compare the behaviour of stock prices in different time periods. In particular, this study attempts to investigate the market behaviour as reflected in stock prices before, during and after a financial crisis, an area which has not been well-researched in the literature, especially in the context of Malaysia.

EMPIRICAL RESULTS

This study first computes the BDS statistics for all the 12 selected Second Board stocks covering the full sample period from 1/1/92 to 30/6/02. All the BDS statistics, $W_{m,n}(\varepsilon)$, are computed in *EViews* version 4.1, for all combinations of m and ε where $m = 2, 3,\ldots\ldots5$ and $\varepsilon = 0.50\sigma, 0.75\sigma, 1.00\sigma, 1.25\sigma$ and 1.50σ. As mentioned earlier, the Monte Carlo simulations in Brock *et al*. (1991) demonstrated that as the dimension goes beyond 5, the small samples properties of BDS degrade, mainly due to the reduction of non-overlapping observations as m grows. To ensure the robustness of the results, this study also computes the bootstrapped *p*-values for the BDS statistics with 10000 repetitions, an option given in *EViews* 4.1.

The BDS test results on the random walk hypothesis over the full sample period are reported in Table 1. It is obvious from Table 1 that all the BDS statistics are in the extreme positive tail of the standard normal distribution. The positive values show that more clustering of points in *m*-dimensional space than would be expected in a true random series. On the other hand, negative BDS statistics indicate that certain patterns are too infrequent. However, only significant BDS statistics, both positive and negative, are indication of non-i.i.d. behaviour. The bootstrapped *p*-values given in parentheses show that all the BDS statistics are significant even at the 1% level, suggesting that all the returns series behave non-randomly. According to Brock *et al*. (1991), the large BDS statistics can arise in two ways. It can either be that the finite sample distribution under the null of i.i.d. is poorly approximated by the asymptotic normal distribution, or the BDS statistics are large when the null hypothesis of i.i.d. is violated. From the various Monte Carlo simulations, Brock *et al*. (1991) ruled out the first possibility, thus suggesting that our large BDS statistics in Table 1 provide strong evidence of departure from the i.i.d. null.

To observe the consistency of the results, the study period is further divided into four sub-periods for separate BDS test. To compensate for smaller sample sizes in certain sub-periods[4], this study also provides the bootstrapped *p*-values with 10,000 repetitions. The comparison across Table 2 through Table 5 reveals that the rejection of the i.i.d. null is consistent in all sub-periods, for all the sampled Second Board stocks. These results confirm our earlier full sample findings and hence provide strong evidence that the price behaviour of individual stocks traded on the Second Board of KLSE do not follow a random walk movement.

The sub-periods analysis not only serves to determine the consistency of the BDS results, it does provide some meaningful comparisons. In particular, the first sub-period from 1/1/92 to 31/12/94 enables the present study to re-examine the robustness of earlier findings reported by Kok and Lee (1994). The results in Table 2 reveal that all the BDS statistics strongly reject the null of i.i.d., indicating the non-random behaviour of Second Board stocks during the first sub-period. This contradicting evidence might be due to the presence of non-linearity or other forms of departures in which standard statistical tests employed by Kok and Lee (1994)- runs test, serial correlation test, Ljung-Box-Pierce Q test and Von Neumann's ratio test, are not able to detect.

With the Asian financial crisis as the break point, this study attempts to investigate the market behaviour as reflected in stock prices, for the three sub-periods of pre-crisis, crisis and post-crisis. Lim *et al*. (2004) postulated that the period during crisis might contribute to the non-random price behaviour. The justification given is that these panic investors inclined to act upon rumours rather than credible information, and hence adversely affects the market's ability to price stocks efficiently. The results in Table 4 clearly demonstrate that all the Second Board stocks behave non-randomly during the crisis period. However, the present study does not provide any empirical support for the conjecture that the Asian financial crisis is the contributing factor that prevents stock prices from following a random walk process, as reported in Lim *et al*. (2004). This can be observed from Table 3 through Table 5 where the null of i.i.d is strongly rejected in the three sub-periods of pre-crisis, crisis and post-crisis.

CONCLUSIONS

This study examines the price behaviour of 12 sampled stocks traded on the Second Board of KLSE in light of the random walk hypothesis. With a new and powerful statistical tool, namely the BDS test, it is possible to detect a more complex form of dependencies in series of financial returns that often appear completely random to standard statistical tests, such as the serial correlation tests, non-parametric runs test, variance ratio test and unit root tests. The results reveal that all the Second Board stocks do not follow a random walk process. This conclusion holds even when the sample period is broken down into four sub-periods.

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[4] The Monte Carlo simulations in Brock *et al*. (1991) suggested that the asymptotic distribution approximates the finite sample distribution of the BDS statistic for 500 or more observations.

Though the present study only includes 12 stocks in the sample due to data availability for the sub-periods analysis, we expect similar price behaviour in other Second Board stocks given the strong rejection of i.i.d null across all the sub-periods. It is possible that the rejection is due to thin trading that prevails in the Second Board stock market (Lo and MacKinlay, 1988). The justification is that new information each day cannot be incorporated into the closing prices, which leads to the prices remaining unchanged and consequently results in correlated returns patterns.

Interpreting the results within the current context, this study concludes that the Second Board stock market is not weak-form efficient, at least for the sample period under study. There are several arguments that support the above interpretation. First, thin market is by itself a characteristic of an inefficient market (Butler and Malaikah, 1992). Second, given the low volume of trading across stocks in the Second Board, it takes considerable time for new information to be incorporated in the current stock price. Third, the arbitrage activities of traders are difficult to execute in this thin market. Hence, unlike an efficient market where detected patterns are quickly arbitraged away, the non-random patterns in the Second Board stocks are likely to prevail simply because traders are unable to remove it (Dockery and Kavussanos, 1996).

REFERENCES

Abhyankar, A.H., Copeland, L.S. and Wong, W. (1995) Nonlinear dynamics in real-time equity market indices: evidence from the United Kingdom, *Economic Journal*, 105: 864-880.

Al-Loughani, N. and Chappell, D. (1997) On the validity of the weak-form efficient markets hypothesis applied to the London stock exchange, *Applied Financial Economics*, 7: 173-176.

Ammermann, P.A. and Patterson, D.M. (2003) The cross-sectional and cross-temporal universality of nonlinear serial dependencies: evidence from world stock indices and the Taiwan Stock Exchange, *Pacific-Basin Finance Journal*, 11: 175-195.

Annuar, M.N. and Shamsher, M. (1993) *The efficiency of the Kuala Lumpur Stock Exchange: a collection of empirical findings*, Selangor, Malaysia: Universiti Putra Malaysia Press.

Annuar, M.N., Ariff, M. and Shamsher, M. (1991) Technical analysis, unit root and weak-form efficiency of the KLSE, *Banker's Journal Malaysia*, 64 (April): 55-58.

Annuar, M.N., Ariff, M. and Shamsher, M. (1993) Weak-form efficiency of the Kuala Lumpur Stock Exchange: an application of unit root analysis, *Pertanika Journal of Social Sciences and Humanities*, 1: 57-62.

Barnes, P. (1986) Thin trading and stock market efficiency: the case of the Kuala Lumpur Stock Exchange, *Journal of Banking Finance and Accounting*, 13: 609-617.

Brock, W.A., Dechert, W.D. and Scheinkman, J.A. (1987) A test for independence based on the correlation dimension, working paper, University of Wisconsin, University of Houston, and University of Chicago.

Brock, W.A., Dechert, W.D., Scheinkman, J.A. and LeBaron, B. (1996) A test for independence based on the correlation dimension, *Econometric Reviews*, 15: 197-235.

Brock, W.A., Hsieh, D.A. and LeBaron, B. (1991) *Nonlinear dynamics, chaos, and instability: statistical theory and economic evidence,* Cambridge: MIT Press.

Brooks, C. (1996) Testing for non-linearity in daily sterling exchange rates, *Applied Financial Economics*, 6: 307-317.

Brooks, C. and Hinich, M.J. (1999) Cross-correlations and cross-bicorrelations in Sterling exchange rates, *Journal of Empirical Finance*, 6: 385-404.

Butler, K.C. and Malaikah, S.J. (1992) Efficiency and inefficiency in thinly traded stock markets: Kuwait and Saudi Arabia, *Journal of Banking and Finance*, 16(1): 197-210.

Campbell, J.Y., Lo, A.W. and MacKinlay, A.C. (1997) *The econometrics of financial markets,* Princeton: Princeton University Press.

Dawson, S.M. (1990) Technical analysis: mixed signals from recent research, *Banker's Journal Malaysia*, 62 (December): 41-44.

Dockery, E. and Kavussanos, M.G. (1996) Testing the efficient market hypothesis using panel data, with application to the Athens stock market, *Applied Economics Letters*, 3: 121-123.

Fama, E.F. (1965) The behavior of stock market prices, *Journal of Business*, 38: 34-105.

Fama, E.F. (1970) Efficient capital markets: a review of theory and empirical work, *Journal of Finance*, 25: 383-417.

Granger, C.W.J. (1975) A survey of empirical studies on capital markets, in E.J. Elton and M.J. Gruber (eds.) *International capital markets*, pp.3-36, Amsterdam: North-Holland.

Hinich, M.J. and Patterson, D.M (1985) Evidence of nonlinearity in daily stock returns, *Journal of Business and Economic Statistics*, 3: 69-77.

Hsieh, D.A. (1989) Testing for non-linearity in daily foreign exchange rate changes, *Journal of Business*, 62: 339-368.

Hsieh, D.A. (1991) Chaos and nonlinear dynamics: application to financial markets, *Journal of Finance*, 46: 1839-1877.

Hsieh, D.A. and LeBaron, B. (1988a) Finite sample properties of the BDS-statistics I: distribution under the null hypothesis*, mimeograph, University of Chicago, and University of Wisconsin.

Hsieh, D.A. and LeBaron, B. (1988b) Finite sample properties of the BDS-statistics II: distribution under the alternative hypothesis*, mimeograph, University of Chicago, and University of Wisconsin.

Kok, K.L. and Goh, K.L. (1995) *Malaysian securities market*, Petaling Jaya, Selangor: Pelanduk Publications.

Kok, K.L. and Lee, F.F. (1994) Malaysian second board stock market and the efficient market hypothesis, *Malaysian Journal of Economic Studies*, 31(2): 1-13.

Lai, M.M., Balachandher, K.G. and Fauzias, M.N. (2003) An examination of the random walk model and technical trading rules in the Malaysian stock market, *Quarterly Journal of Business and Economics*, 41(1/2): 81-103.

Laurence, M. (1986) Weak-form efficiency in the Kuala Lumpur and Singapore stock markets, *Journal of Banking and Finance*, 10: 431-445.

Liew, V.K.S., Chong, T.T.L and Lim, K.P. (2003) The inadequacy of linear autoregressive model for real exchange rates: empirical evidence from Asian economies, *Applied Economics*, 35: 1387-1392.

Lim, K.P., Habibullah, M.S. and Lee, H.A. (2003) A BDS test of random walk in the Malaysian stock market, *Labuan Bulletin of International Business and Finance*, 1(1): 29-39.

Lim, K.P., Habibullah, M.S. and Lee, H.A. (2004) Do Asian stock market prices follow random walk? A revisit, *International Journal of Management Studies* (formerly known as *Jurnal Analisis*), 11 (special issue): 101-126.

Lo, A.W. and MacKinlay, A.C. (1988) Stock market prices do not follow random walks: evidence from a simple specification test, *Review of Financial Studies*, 1: 41-66.

McInish, H. and Puglisi, D.J. (1982) The efficiency of the international money market, *Journal of Business Finance and Accounting*, 9(2): 167-177.

Opong, K.K., Mulholland, G., Fox, A.F. and Farahmand, K. (1999) The behavior of some UK equity indices: an application of Hurst and BDS tests, *Journal of Empirical Finance*, 6: 267-282.

Patterson, D.M. and Ashley, R.A. (2000) *A nonlinear time series workshop: a toolkit for detecting and identifying nonlinear serial dependence*, Boston: Kluwer Academic Publishers.

Saw, S.H. and Tan, K.C. (1989) Test of random walk hypothesis in the Malaysian stock market, *Securities Industry Review*, 15(1): 45-50.

Scheinkman, J. and LeBaron, B. (1989) Nonlinear dynamics and stock returns, *Journal of Business*, 62: 311-337.

Serletis, A. and Shintani, M. (2003) No evidence of chaos but some evidence of dependence in the US stock market, *Chaos, Solitons and Fractals*, 17: 449-454.

Steurer, E. (1995) Nonlinear modeling of the DEM/USD exchange rate, in A.P. Refenes (ed.) *Neural networks in the capital markets,* pp.199-211, New York: John Wiley & Sons.

Yong, O. (1989) The price behaviour of Malaysian stocks, *Malaysian Management Review*, 24(3): 23-34.

Yong, O. (1993) Market efficiency (weak-form) of the Malaysian stock exchange, in I. Ibrahim and O. Yong (eds.) *Understanding the behavioural patterns of stock prices: a collection of readings on selected far eastern stock markets*, pp.73-95, Kuala Lumpur: Leeds Publications.

Table 1: BDS Test Results for Second Board Stocks (Full Sample- 1/1/92 to 30/6/02)

ε/σ	m	CICB	Chase	CFM	DPrep	Denko	KFM	MayPak	Mercury	Poly	PPHB	RCI	Setegap
0.50	2	11.8823	16.5272	13.5117	16.3146	14.9930	10.9102	14.4802	16.6743	15.6771	10.6541	13.1794	14.2221
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	14.8541	20.4903	17.1317	19.8221	16.5313	14.1332	20.0261	20.1076	19.8188	14.5470	17.3410	17.3117
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	19.4962	25.0019	19.2713	22.4329	17.7292	16.5440	26.8633	23.8432	23.6793	17.4827	21.8436	19.9186
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	25.0330	30.5718	22.1199	26.2650	19.3911	19.3215	35.7345	28.8379	28.8251	22.3539	28.5606	22.4624
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
0.75	2	12.9978	16.8678	12.4689	16.4776	15.9857	11.7966	14.1328	16.6433	16.2967	10.7102	12.1304	15.7764
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	15.8740	19.6291	15.0532	19.0134	17.2016	14.6955	18.0275	19.0584	19.4048	13.8281	14.4962	18.3483
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	18.7474	22.3705	16.0882	20.5006	17.8550	16.5711	22.0330	21.1996	21.7662	14.8449	16.6655	20.3510
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	21.9918	25.5893	17.1775	22.5159	18.7010	18.3607	26.1605	23.9161	24.5659	16.6191	19.7540	22.1783
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.00	2	13.0929	17.7508	12.0552	16.3576	16.6279	12.7538	13.8439	16.5775	17.0077	10.5403	11.9274	16.8475
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	15.0835	19.7694	14.1701	18.4778	17.6602	15.3398	16.3627	18.6356	19.5953	13.0847	14.1976	18.9374
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	16.7857	21.5206	15.0849	19.4355	17.9791	16.9600	18.6817	19.8693	21.1866	13.6359	15.7337	20.3461
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	18.5020	23.5538	15.9104	20.5629	18.3569	18.0759	21.0172	21.3098	22.9393	14.5029	17.3075	21.7129
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.25	2	12.2566	18.5645	11.2939	16.2974	16.8893	12.7173	12.9204	16.2256	17.5886	10.9472	12.6800	17.8535
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	14.0833	20.0601	12.9875	18.1514	17.7778	15.0037	14.6509	18.2002	19.5838	13.0911	14.3115	19.2961
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	15.4238	21.2209	13.6280	18.7392	17.8932	16.1299	15.9403	18.9450	20.5856	13.4821	15.2769	20.2228
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	16.2977	22.4400	14.1049	19.1803	18.0814	16.6970	17.2709	19.7895	21.5629	14.0564	16.1401	21.0112
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.50	2	10.4043	19.0859	11.4392	16.6046	16.8615	12.8257	13.2046	15.5691	18.6410	11.1652	12.2259	18.1782
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	12.6590	20.2817	12.8828	18.4055	17.5670	14.5593	14.4127	17.6638	20.2503	13.0732	13.5469	19.3710
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	14.0328	21.0483	13.3990	18.8092	17.4316	15.2078	14.9836	18.2434	20.9250	13.4262	14.2326	20.0715
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	14.4894	21.7466	13.8188	18.9212	17.4087	15.3322	15.9059	18.7564	21.4187	13.9355	14.7996	20.4788
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Notes: All the BDS test statistics are computed using *EViews* version 4.1. Asymptotically, the computed BDS test statistics, $W_{m,n}(\varepsilon) \sim N(0,1)$ under the null of i.i.d. This table provides the bootstrapped *p*-values in parentheses, with 10000 repetitions, generated by *EViews*. As a whole, the results show that all the BDS test statistics are significant even at the 1% level.

Table 2: BDS Test Results for Second Board Stocks (Sub-Period 1- 1/1/92 to 31/12/94)

ε/σ	m	CICB	Chase	CFM	DPrep	Denko	KFM	MayPak	Mercury	Poly	PPHB	RCI	Setegap
0.50	2	5.7553	6.0780	6.7018	6.9213	5.2201	3.4839	6.6762	8.1409	7.2224	8.0522	3.7150	6.7504
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0016)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0008)	(0.0000)
	3	6.8694	7.1988	8.6546	8.8746	5.9455	7.2311	7.6197	10.0537	8.1269	10.3052	4.4974	7.4163
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)
	4	8.1677	8.3721	9.3195	9.8812	6.4811	9.8138	9.3003	11.4575	8.5622	11.9601	5.0188	8.3630
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)
	5	9.1992	10.1942	10.6233	11.6701	7.9996	13.0396	11.6077	13.2826	9.7225	15.0796	6.2948	9.3354
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)
0.75	2	6.2868	6.4901	7.3291	6.8403	5.5561	3.9427	7.3664	8.6191	7.6503	7.9495	4.2490	7.7212
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0008)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	7.4670	8.2084	8.8232	8.1053	5.9739	6.2875	8.1389	9.9435	8.7984	9.4823	5.5050	9.2517
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	8.6267	9.6481	9.1505	8.7024	6.3419	7.3826	9.1994	10.6368	9.0935	9.8465	6.1712	10.2221
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	9.6906	11.4718	9.9853	9.6127	7.2135	8.7050	10.4006	11.5523	9.5820	10.4805	7.1820	11.3331
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.00	2	6.9862	5.7108	7.2856	6.8051	5.8557	5.0308	8.2073	8.2272	7.6625	7.2749	4.8632	8.5796
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	8.1150	7.4877	8.2270	7.4605	6.1965	7.2230	9.0602	9.2909	8.7147	8.5249	6.1222	9.8404
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	9.0953	8.6962	8.5071	7.7705	6.3402	8.4168	9.6805	9.5947	8.7160	8.4761	6.7777	10.5734
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	10.0220	9.7668	9.2876	8.2062	6.8967	9.0953	10.4225	9.9652	8.9119	8.4182	7.4457	11.1385
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.25	2	7.1272	5.5856	7.0048	6.5838	6.6471	5.0549	8.5697	7.9770	7.6768	7.0626	5.7752	9.1981
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	8.1444	7.2799	7.4651	6.7424	7.0299	7.3884	9.4195	8.8323	8.6601	7.8737	6.9241	10.5934
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	9.0866	8.1882	7.3616	6.9453	7.1621	8.6909	9.8608	8.9198	8.4946	7.4960	7.4927	11.1735
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	9.7043	8.8918	7.6930	7.1823	7.4199	9.2503	10.4551	9.0859	8.5010	7.1910	8.0126	11.6211
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.50	2	6.3851	5.2211	6.9849	6.2873	7.3107	4.7930	8.0522	8.2203	7.6768	7.6560	5.5473	9.0970
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	7.5483	6.8587	7.2040	6.3318	7.7141	7.0097	8.8573	9.0574	8.6601	8.3285	6.5219	10.0969
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	8.3423	7.5526	6.9235	6.5347	7.7406	8.1158	9.3126	9.1501	8.4946	7.9034	7.1162	10.3872
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	8.6087	7.9985	7.0506	6.6773	7.8782	8.4691	9.8985	9.2546	8.5010	7.6755	7.5034	10.6427
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Notes: All the BDS test statistics are computed using *EViews* version 4.1. Asymptotically, the computed BDS test statistics, $W_{m,n}(\varepsilon) \sim N(0,1)$ under the null of i.i.d. To compensate for smaller sample sizes, this table provides the bootstrapped *p*-values in parentheses, with 10000 repetitions, generated by *EViews*. The table shows that all the BDS test statistics are significant even at the 1% level.

Table 3: BDS Test Results for Second Board Stocks (Sub-Period 2 / Pre-Crisis- 1/1/95 to 30/6/97)

ε/σ	m	CICB	Chase	CFM	DPrep	Denko	KFM	MayPak	Mercury	Poly	PPHB	RCI	Setegap
0.50	2	3.7593	4.5678	6.8438	4.4150	5.0629	4.4881	4.0822	4.3698	3.9179	2.3473	5.1114	3.2217
		(0.0010)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0004)	(0.0000)	(0.0020)	(0.0354)	(0.0000)	(0.0038)
	3	3.7779	5.9153	8.9743	5.3407	5.2806	5.2541	5.3502	5.9169	6.7803	2.4330	6.0686	4.1921
		(0.0022)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0364)	(0.0000)	(0.0018)
	4	5.0127	6.3044	9.7034	4.9309	4.7058	6.2231	6.9681	7.6381	11.0152	2.8093	7.3396	5.0050
		(0.0012)	(0.0000)	(0.0000)	(0.0006)	(0.0014)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0274)	(0.0000)	(0.0014)
	5	6.1208	6.4398	11.1871	4.8108	4.5372	6.7370	8.3007	8.6063	16.4589	3.1870	9.3919	5.8631
		(0.0008)	(0.0000)	(0.0000)	(0.0020)	(0.0036)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0260)	(0.0000)	(0.0016)
0.75	2	4.4163	4.1517	5.8085	5.2182	5.8808	3.4390	4.2040	4.6494	3.7607	2.5848	5.1979	3.2669
		(0.0000)	(0.0006)	(0.0000)	(0.0000)	(0.0000)	(0.0032)	(0.0004)	(0.0000)	(0.0018)	(0.0234)	(0.0000)	(0.0024)
	3	4.4614	5.3778	7.4664	6.5009	5.9344	4.2868	5.3190	5.8946	5.5807	2.4953	5.7854	3.6419
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0002)	(0.0000)	(0.0000)	(0.0268)	(0.0000)	(0.0016)
	4	5.2836	5.3506	7.9042	6.0762	5.3567	4.9018	6.5949	7.2726	7.2829	2.6479	6.6803	4.1570
		(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0006)	(0.0002)	(0.0000)	(0.0000)	(0.0254)	(0.0000)	(0.0016)
	5	5.7506	5.5419	8.2226	5.9041	5.0588	5.4761	7.6402	8.2234	9.4005	3.3408	7.7691	4.4771
		(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0012)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0106)	(0.0000)	(0.0022)
1.00	2	4.4286	4.7986	5.0316	5.9024	6.1953	3.6152	4.7319	4.8027	3.1640	2.6766	5.2705	3.6152
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0006)	(0.0000)	(0.0000)	(0.0036)	(0.0138)	(0.0000)	(0.0006)
	3	4.4656	5.7109	6.7266	7.1490	6.1374	4.2679	5.7755	6.1412	4.4449	3.0058	5.6158	3.7450
		(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0064)	(0.0000)	(0.0006)
	4	5.2633	5.4850	7.2281	6.9348	5.6161	4.7123	6.7990	7.4120	5.4451	3.0342	6.2856	4.1644
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0072)	(0.0000)	(0.0006)
	5	5.7450	5.6835	7.4218	6.8076	5.2955	5.0454	7.8110	8.0845	6.4985	3.4467	7.4054	4.5452
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0042)	(0.0000)	(0.0004)
1.25	2	4.3361	5.2905	4.6576	6.0072	6.3601	3.2787	4.8508	4.6742	2.9643	3.4565	5.2753	3.6885
		(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0028)	(0.0000)	(0.0000)	(0.0056)	(0.0022)	(0.0000)	(0.0010)
	3	4.4351	6.0109	6.1084	7.3532	6.2265	3.9130	5.6401	6.1765	4.1300	3.5695	5.5455	3.7583
		(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0004)	(0.0014)	(0.0000)	(0.0002)
	4	5.0694	5.5819	6.5940	7.3036	5.7088	4.1102	6.3094	7.3176	4.8979	3.4122	6.1073	4.2572
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0028)	(0.0000)	(0.0002)
	5	5.3542	5.8692	6.7836	7.2145	5.3338	4.4767	7.2240	7.7398	5.8722	3.7610	6.9370	4.6380
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0012)	(0.0000)	(0.0004)
1.50	2	4.6792	6.0934	4.3579	6.1745	6.1320	2.9533	4.8778	4.5736	2.9036	3.3711	4.8508	4.2234
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0054)	(0.0000)	(0.0000)	(0.0066)	(0.0030)	(0.0000)	(0.0000)
	3	4.9809	6.7132	5.6049	7.4875	5.8012	3.4246	5.3659	6.1642	3.9491	3.4867	4.7959	4.1632
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0018)	(0.0000)	(0.0000)	(0.0002)	(0.0022)	(0.0000)	(0.0000)
	4	5.5513	6.2690	6.0854	7.5084	5.3671	3.5061	5.8776	7.2522	4.4787	3.2231	5.1386	4.6748
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0010)	(0.0000)	(0.0000)	(0.0000)	(0.0036)	(0.0000)	(0.0000)
	5	5.6878	6.6002	6.1761	7.4181	5.0710	3.8250	6.7662	7.5261	5.3394	3.5234	5.6350	5.1109
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0010)	(0.0000)	(0.0000)	(0.0000)	(0.0022)	(0.0000)	(0.0000)

Notes: All the BDS test statistics are computed using *EViews* version 4.1. Asymptotically, the computed BDS test statistics, $W_{m,n}(\varepsilon) \sim N(0,1)$ under the null of i.i.d. To compensate for smaller sample sizes, this table provides the bootstrapped *p*-values in parentheses, with 10000 repetitions, generated by *EViews*. The table shows that all the BDS test statistics are significant at least at the conventional 5% level.

Table 4: BDS Test Results for Second Board Stocks (Sub-Period 3 / Crisis- 1/7/97 to 30/6/99)

ε/σ	m	CICB	Chase	CFM	DPrep	Denko	KFM	MayPak	Mercury	Poly	PPHB	RCI	Setegap
0.50	2	4.9851	6.7096	5.6744	8.6299	7.8932	6.0262	5.2287	7.1223	7.8986	2.3074	5.4040	7.1121
		(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0332)	(0.0002)	(0.0000)
	3	7.1316	7.0613	6.2747	9.7731	9.0937	7.1336	4.9150	8.4173	9.0827	4.2997	8.0175	8.5689
		(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0006)	(0.0000)	(0.0000)
	4	8.4961	7.1406	6.5454	10.2645	9.4314	7.5635	5.5873	9.0446	10.1088	5.1544	11.1911	9.5717
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)
	5	10.2027	7.3896	6.0636	11.6541	9.9791	7.8688	5.6687	10.3712	10.7418	6.5503	14.8106	11.6159
		(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0006)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
0.75	2	5.3990	7.8790	5.2039	8.4953	8.3464	6.8138	5.1007	7.3899	8.5755	2.6744	5.3398	8.1256
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0112)	(0.0000)	(0.0000)
	3	7.2440	8.2885	5.6480	9.4561	9.2205	7.9346	4.8468	8.4435	9.2046	4.5791	6.7623	9.4148
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	8.2158	8.7788	5.8677	9.8202	9.3942	8.3311	4.8126	8.5267	9.8601	5.4794	8.3104	10.2806
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	9.6226	9.3939	5.8279	10.6447	9.6705	8.7876	4.5588	8.9294	10.4032	6.3771	9.8721	11.6563
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.00	2	5.0622	8.8662	4.5927	8.5592	8.3102	7.6545	5.4642	7.4778	8.9599	3.3237	5.3419	8.8395
		(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0024)	(0.0000)	(0.0000)
	3	6.6881	9.0890	4.8515	9.4427	8.9740	8.5835	5.0884	8.6257	9.5675	4.9058	6.0724	9.8094
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	7.7692	9.3604	5.1081	9.6793	8.9690	8.8026	4.9751	8.7650	10.2600	5.7137	6.6353	10.3886
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	8.8560	9.7808	5.1994	10.0698	9.0911	9.0103	4.7328	9.0457	10.7336	6.4007	7.1786	11.1209
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.25	2	4.2854	9.6938	4.8163	8.4147	8.2867	8.1211	5.4329	7.3912	9.2511	3.7340	4.9899	8.9652
		(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)
	3	5.9301	10.0422	5.0860	9.1124	8.8568	8.6266	5.1719	8.5385	9.9831	4.9457	5.4319	9.8621
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	7.0036	10.2546	5.4201	9.3209	8.6803	8.6030	5.0390	8.6817	10.6897	5.6554	5.5553	10.2543
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	7.7906	10.6467	5.7901	9.5765	8.7364	8.4148	4.7351	8.7334	11.0306	6.2618	5.7865	10.5837
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.50	2	4.3846	9.7796	5.1816	7.7593	7.8284	8.1633	4.7656	7.1312	9.1751	3.7903	4.2006	8.6467
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0012)	(0.0006)	(0.0000)
	3	5.9835	10.0517	5.1123	8.4240	8.5520	8.4514	4.4882	8.2148	9.9186	4.7915	4.7225	9.6227
		(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	7.0496	10.1680	5.1128	8.6871	8.4092	8.4307	4.3669	8.3816	10.3891	5.3269	4.9071	9.9036
		(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	5	7.5706	10.4388	5.4727	8.8966	8.4816	8.2047	4.0064	8.4015	10.5547	5.8119	5.1212	10.0422
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0008)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Notes: All the BDS test statistics are computed using *EViews* version 4.1. Asymptotically, the computed BDS test statistics, $W_{m,n}(\varepsilon) \sim N(0,1)$ under the null of i.i.d. To compensate for smaller sample sizes, this table provides the bootstrapped *p*-values in parentheses, with 10000 repetitions, generated by *EViews*. The table shows that all the BDS test statistics are significant at least at the conventional 5% level.

Table 5: BDS Test Results for Second Board Stocks (Sub-Period 4 / Post-Crisis- 1/7/99 to 30/6/02)

ε/σ	m	CICB	Chase	CFM	DPrep	Denko	KFM	MayPak	Mercury	Poly	PPHB	RCI	Setegap
0.50	2	5.6544	9.4731	6.0259	7.4944	7.8936	6.4167	5.7574	7.5210	6.9200	4.2642	6.7967	7.9006
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)
	3	6.7517	10.6115	7.4617	9.0561	8.7821	7.3701	8.0846	8.2698	8.1497	5.2204	8.0678	9.1658
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	8.2683	12.5514	8.6417	10.5800	10.1048	8.2729	9.9664	9.6477	8.9857	4.9053	8.8595	9.4562
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)
	5	9.2384	15.1180	10.0012	13.0055	11.2240	9.5216	12.4867	11.3259	9.8504	5.6096	9.7265	9.3033
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)
0.75	2	5.6605	8.8993	5.1411	6.8796	7.4810	7.3761	3.9783	7.6416	7.5127	3.8720	6.8512	8.2236
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)
	3	5.6325	9.4657	6.3215	7.7412	7.8325	8.5058	6.3769	7.7934	8.9645	4.6596	7.4607	8.7203
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	6.6435	10.2577	6.5908	8.3608	8.5860	9.3465	7.9906	8.6251	9.9042	3.9175	7.7744	8.8072
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0008)	(0.0000)	(0.0000)
	5	7.2773	11.5825	6.8412	9.3388	9.2152	10.3172	9.6650	9.6406	10.7096	4.5784	8.2948	8.5359
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.00	2	5.4768	8.8228	5.9405	6.7231	7.4122	7.9228	3.3664	7.5530	7.2075	4.6530	6.0140	8.5836
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0022)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	5.5561	9.3557	6.9672	8.0559	7.6663	8.9574	5.9077	7.6995	8.6199	5.1719	5.8736	9.3862
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	5.9575	10.0871	7.2441	8.7124	7.9984	9.5727	7.3483	8.1940	9.4061	4.3767	5.7766	9.5618
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)
	5	6.5777	11.0346	7.5429	9.2068	8.2839	9.9598	8.5688	8.8290	10.1734	4.5142	6.1013	9.4627
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1.25	2	4.9271	8.9711	6.3320	5.8267	7.2708	7.7591	2.6537	7.0849	7.1396	3.9453	4.9275	8.4933
		(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0180)	(0.0000)	(0.0000)	(0.0006)	(0.0002)	(0.0000)
	3	4.9287	9.6925	7.2089	7.2264	7.4151	8.6971	4.3951	7.2587	8.5474	3.9263	5.1804	9.1269
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0006)	(0.0000)	(0.0000)
	4	4.7754	10.3756	7.3609	7.6595	7.5463	9.4358	5.4586	7.5924	9.1471	3.4141	5.3250	9.1842
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0022)	(0.0000)	(0.0000)
	5	4.7535	11.1335	7.5770	7.8719	7.7774	9.6997	6.1518	8.0359	9.7428	3.3193	5.5915	9.0519
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0024)	(0.0000)	(0.0000)
1.50	2	4.0307	8.7615	5.6701	6.0201	6.9656	7.1975	2.7908	6.3763	7.2813	4.5157	5.0566	8.7771
		(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0134)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	3	3.9380	9.4846	6.6114	7.2769	7.0771	8.1167	4.1511	6.9474	8.5542	4.7982	5.2016	9.4708
		(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	4	3.9882	10.0295	6.8726	7.4461	7.0327	8.7697	4.2922	7.2811	8.8945	4.4504	5.5502	9.6226
		(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)
	5	3.8669	10.5184	7.0471	7.3558	7.1940	8.8879	4.6482	7.6619	9.2821	4.4353	5.9686	9.5680
		(0.0012)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)

Notes: All the BDS test statistics are computed using *EViews* version 4.1. Asymptotically, the computed BDS test statistics, $W_{m,n}(\varepsilon) \sim N(0,1)$ under the null of i.i.d. To compensate for smaller sample sizes, this table provides the bootstrapped *p*-values in parentheses, with 10000 repetitions, generated by *EViews*. The table shows that all the BDS test statistics are significant at least at the conventional 5% level.

APPENDIX
LIST OF SAMPLED STOCKS

NO.	STOCK CODE	COMPONENT STOCK	ABBREVIATION
1	8052	CENTRAL INDUSTRIAL CORPORATION BHD	CICB
2	8214	CHASE PERDANA BHD	Chase
3	8044	COMPUTER FORMS (M) BHD	CFM
4	8338	DATAPREP HOLDINGS BHD	DPrep
5	8176	DENKO INDUSTRIAL CORPORATON BHD	Denko
6	8303	KUANTAN FLOUR MILLS BHD	KFM
7	8095	MALAYSIA PACKAGING INDUSTRY BHD	MayPak
8	8192	MERCURY INDUSTRIES BHD	Mercury
9	8117	POLY GLASS FIBRE (M) BHD	Poly
10	8273	PUBLIC PACKAGES HOLDINGS BHD	PPHB
11	8087	ROCK CHEMICAL INDUSTRIES (M) BHD	RCI
12	8184	SETEGAP BHD	Setegap

Dynamic Relationship in Regional Stock Markets: Evidence from the Asian Countries

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ABSTRACT

This study examines the nature of the dynamic relationship among stock markets within the same geographical area. Performance of seven major stock markets in the Asian region namely Malaysia, Hong Kong, Indonesia, Japan, the Philippines, Singapore and Thailand, from July 1997 to December 2002 were studied. The period was further divided into two sub-periods, comprising the period of during and after the Asian financial crisis, to enable for thorough examination on the degree of regional integration under varying economic conditions. The correlation test shows that while there is evidence of positive correlation among the Asian stock markets, the level of correlation is rather weak for all periods. The error correction model (ECM) reveals that there is causality effect in the Asian stock markets and the effect is heavily influenced by their geographical proximity. Nevertheless, both the correlation and the causality relationships are found to be stronger during the crisis period. The results provide robust evidence on regional stock market integration due mainly to the impact of globalisation.

INTRODUCTION

The globalisation of the world financial markets has brought new challenges to international fund managers. The globalisation increases the cross correlation among equity markets especially those located within the same geographical area thus, altering the return and risk profiles of each individual markets in the region. Therefore, the prospective return from an individual country is no longer exclusively affected by its domestic factors but is also influenced by events in the neighbouring countries. As a result, all markets within the same region would be viewed as sharing similar risk despite the differences in their market structure and composition as well as trading microstructure. The 1997 Asian financial crisis clearly demonstrated how the Malaysian stock market is vulnerable to external shocks as a result of the regional markets integration.

This paper attempts to examine the nature of the dynamic relationship among stock markets in the Asian region. In particular, this study analyses the cross correlation and causality effect between stock markets in Malaysia, Hong Kong, Indonesia, Japan, the Philippines, Singapore and Thailand during and after the 1997 Asian financial crisis. The motivation of this paper is that, previous studies on the integration of the Malaysian stock market with the regional markets are rather limited whilst the methodology used are rather restricted. Past research merely focussed on the market correlation rather than the causality aspect of the market relationship. In addition, most of the earlier studies covered the period before the 1997 Asian financial crisis and did not look into the varying degree of the relationship under different economic conditions. Instead, this paper offers a more robust analysis by applying three different methodologies namely the correlation test, the Johansen cointegration test as well as the error correction model (ECM), and covers longer time period to examine the varying degree of the regional integration. The ECM, in particular, allows us to analyse the causality effect between the stock markets.

The remaining of this paper is organised as follows. Section 2 presents the literature review relevant to this study. Section 3 discusses the data and methodology used in the analysis as well as the empirical results and their interpretation. Section 4 gives the concluding remarks.

PRIOR RESEARCH

Previous studies have recorded some evidence of correlation among the international stock markets. Ripley (1973) and Ibbotson *et. al.* (1982) found significant relationship between stock markets in Europe, Asia and other English-speaking countries. Cha and Cheung (1998) observed that the impact from the US and Japan markets are larger on the Hong Kong and Singapore markets than on the South Korea and Taiwan markets after the October 1987 stock market crash. Masih and Masih (1997) studied the dynamic causal linkages among eight international market indices, and concluded that both the US and the UK markets have significant relationship with most of the Asian stock markets. On regional integration, Darbar and Deb (1997) observed

that the US and Canadian stock markets are highly correlated whilst Chen *et. al* (2002) found similar correlation among the Latin American markets.

With regards to the Malaysian stock market, Yong (1990) found that the performance of the Malaysian market is influenced by the performance of the international markets. His study covered the period from January 1984 to December 1988. Despite the interdependency however, he observed that historical price movements of the other markets do not help in the prediction of the future direction of the Malaysian market. In another study, Yong (1992) found further evidence of co-movement between stock markets in Malaysia, Hong Kong, Australia, Japan, the UK as well as the US markets.

Bekaert and Harvey (1995) observed that the level of integration between emerging markets (including Malaysia) with developed markets has increased. In the case of the Malaysian stock market, they argued that the integration is prompted by the local market's greater liquidity, easy access by foreign investors and high ratio of foreign ownership in Malaysian companies. Studies by Cha and Cheung (1998) as well as Johnson and Soenen (2002) revealed that the Asian stock markets including Malaysia have strongly integrated with the Japanese markets. Analysis by Bilson *et. al.* (2000) found that the regional integration among stock markets in Malaysia, the Philippines, South Korea, Taiwan and Thailand is even faster than their integration with the global markets.

In general, past studies have found that international stock markets are increasingly correlated. Evidence of regional market correlation is robust in the North America, the Latin America and the Asian regions. Various reasons have been suggested to explain the stock market integration. Ripley (1973) and Ibbotson *et. al.* (1982) attributed the correlation to geographical proximities, institutional currency relations, trade partnerships, cultural resemblances and similarity in economic activities. Cheung *et. al.* (1997) and Tsutsui and Hirayama (1998) suggested that the co-movement in stock prices as due to external shocks, such as a substantial changes in oil prices or stock index levels, originally occurring in a particular (foreign) country but are simultaneously monitored and responded by investors in other countries. Meanwhile, the advancement of information and telecommunication technology, growing international and regional trades, and accumulation of wealth through cross country investments (such as aggressive international fund managers) has also been cited as contributing to the integration of the international financial markets. However, although most stock markets have been found to be correlated, this does not explain the nature of the causality effect between the stock markets.

METHODOLOGY AND RESULT DISCUSSION

Data Description

Daily index closing of seven major Asian stock markets namely the Kuala Lumpur Composite Index ("KLCI"), the Straits Times Industrial Index ("STI"), the SET Index ("SET"), the PSI Index ("PSI"), the JSE Index ("JSE"), the 225-shares Nikkei Average Index ("Nikkei"), and the Hang Seng Index ("HSI") were used as samples in this study. The indices represent the main performance benchmark for stock markets in Malaysia, Singapore, Thailand, the Philippines, Indonesia, Japan and Hong Kong, respectively. The data were obtained from the *World Indices* pages available via internet through the *Yahoo! Finance* service website. The full sample period covers from July 1997 to December 2002, involving a total of 9,982 observations for all of the seven stock markets. The period was further divided into two sub-periods namely: the crisis period from July 1997 to June 1999 (Sub-Period I), and the post-crisis period from July 1999 to December 2002 (Sub-Period II). The period classification is consistent with the general believe that the Asian financial crisis started in July 1997 prompted by the *de-facto* devaluation of the Thai baht on July 2, 1997, that was followed by similar devaluation of the Philippine peso (July 11), the Malaysian ringgit (July 14), and the Indonesian rupiah (August 14) (see Chen *et. al.*, 2002). The crisis reached its peak in 1998, engulfing the entire Southeast Asian region and spread over to Hong Kong and South Korea, before it gradually abated with most of the crisis hit countries later managed to recover in 1999 albeit at different success rates.

Methodology

To ensure the reliability and robustness of the analysis, this study applied three different tests to examine the regional integration namely the correlation test, the Johansen cointegration test and the error correction model (ECM). However, since casual observation on the daily closing charts for all indices reveals that the data series are non-stationary, we first conduct unit root test to examine whether the indices are indeed non-stationary, or otherwise. We use the Augmented Dickey-Fuller (ADF) unit root test (Dickey and Fuller, 1979) to determine the stationarity (or nonstationarity) of the data series. The test involved of regressing the following equation:

$$\Delta y_t = \mu + \gamma y_{t-1} + \sum_{i=1}^{n} \delta_i \Delta y_{t-1} + \varepsilon_t \tag{1}$$

where $\Delta y_t = y_t - y_{t-1}$, t is the time or trend variable, and ε_t is assumed to be white noise. The ADF unit root test is carried out by estimating the coefficient of y_{t-1} in the above equation under the null hypothesis that $\gamma = 0$ i.e. the time series has a unit root (or is nonstationary), against the alternative hypothesis that $\gamma < 0$ i.e. the time series has no unit root (or is stationary). Thus, the rejection of the null hypothesis would imply that the time series data is stationary.

The correlation test measures the cross correlations between two time series data, namely x and y, using the following equation:

$$r_{xy}(\ell) = \frac{c_{xy}(\ell)}{\sqrt{c_{xx}(0)}\sqrt{c_{yy}(0)}} \qquad \ell = 0, \pm1, \pm2, \dots, \tag{2}$$

where;

$$c_{xy}(\ell) = \begin{cases} \sum_{t=1}^{T-\ell} (x_t - \bar{x})(y_{t+\ell} - \bar{y}) / T & \ell = 0, 1, 2, \dots, \\ \\ \sum_{t=1}^{T+\ell} (y_t - \bar{y})(x_{t-\ell} - \bar{x}) / T & \ell = 0, -1, -2, \dots, \end{cases} \tag{3}$$

The correlation test determines the cross relationship between the two variables, x and y, under the null hypothesis that the two variables are not correlated. Hence, the rejection of the null hypothesis indicates that the two variables are correlated. The correlation is measured by its coefficient of correlation that takes a value between -1 and +1. A coefficient of correlation that equals -1 signifies a perfect negative correlation whilst a coefficient of correlation that equals +1 suggests a perfect positive correlation.

The test for cointegration (long-run equilibrium) is based on methodology developed by Johansen (1991, 1995). This involved of estimating the eigenvalues, and the likelihood ratio (LR) test statistics obtained as follows:

$$Q_r = -T \sum_{i=r+1}^{k} \log(1 - \lambda_i) \tag{4}$$

where Q_r is the trace statistic, T is the number of observation and λ_i is the i-th largest eigenvalue for $r = 0, 1, 2, \dots, k$-1. The null hypothesis states that the stock market indices are not cointegrated against the alternative hypothesis that there is one or more cointegrating vector. The critical values for the trace statistic used are based on the table reported by Osterwald-Lenum (1992).

The ECM test is used to determine the causality effect relationship between two variables, x and y, and is undertaken subsequent to the cointegration test. In general, if y_t and x_t is not cointegrated the following regressions are applied:

$$Dy_t = a_0 + \sum_{i=1}^{n} a_{1i} Dy_{t-i} + \sum_{j=1}^{n} a_{2j} Dx_{t-j} + u_t \tag{5}$$

$$Dx_t = b_0 + \sum_{i=1}^{m} b_{1i} Dy_{t-i} + \sum_{j=1}^{m} b_{2j} Dx_{t-j} + v_t \tag{6}$$

where u_t and v_t are stochastic error whilst n and m are the lag of lat chosen based on the AIC. In this case, x_t is said to cause changes in y_t if the coefficient of a_{2j} in regression (5) is significant whilst the value of b_{1i} in regression (6) is not significant. On the other hand, y_t is said to cause changes in x_t if the value of a_{2j} in

regression (5) is significant whilst the value of b_{1i} in regression (6) is not significant. In addition, a bilateral causality exists between y_t and x_t if both the slope coefficients, a_{2j} and b_{1i}, are significant.

However, in the case that y_t and x_t are not cointegrated, the following regressions will be used:

$$Dy_t = a_0 + \sum_{i=1}^{n} a_{1i} Dy_{t-i} + \sum_{j=1}^{n} a_{2j} Dx_{t-j} + a_3 z_{t-1} + u_t \qquad (7)$$

$$Dx_t = b_0 + \sum_{i=1}^{m} b_{1i} Dy_{t-i} + \sum_{j=1}^{m} b_{2j} Dx_{t-j} + b_3 z_{t-1} + v_t \qquad (8)$$

where z_{t-1} represents the error correction or cointegration vector obtained from the cointegration test, x_t is said to cause changes in y_t if the value of a_{2j} or a_3 in regression (7) is significant. On the other hand, y_t is said to cause changes in x_t if the value of b_3 or b_{1i} in regression (8) is significant. In addition, bilateral causality effect exists between y_t and x_t if both the slope coefficients, a_{2j} or a_3 and b_3 or b_{1i}, are significant.

Results Discussion

Statistical descriptions on the daily return[1] profiles of the seven Asian stock markets for all periods are given in Table 1. During the period under reviewed, the Malaysian market emerged as the most volatile as compared to the other markets. The benchmark KLCI registered the highest one-day gain with a maximum return of 20.8 percent but it also suffered the largest single day loss of 24.2 percent. Both were recorded during the crisis period (July 1997 to June 1999). Nevertheless, the large decline occurred during the early part of the crisis period whilst the substantial gain was achieved in the last part of the crisis period. Based on the standard deviation, the Malaysian market was the riskiest market with standard deviation of 2.2 percent during the full period, and 3.2 percent during the crisis period. The situation however, reversed significantly in the post crisis period (July 1999 to December 2002) when the standard deviation decreased to 1.3 percent, the lowest among the Asian markets. The improvement signifies the successful implementation of the selected capital control and various economic recovery measures introduced in early September 1998 that brought stability back to the Malaysian market. On the other hand, the risk level for stock markets in the two countries most affected by the Asian financial crisis, Thailand and Indonesia, remained high during the post crisis period with standard deviation of 1.6 and 1.5 percent, respectively.

Table 2 gives the ADF unit root test result on the data series. With exception of Thailand and Indonesian markets, data for the other markets are found to contain unit root and hence, are nonstationary at their level i.e. I(0). The null hypothesis of having a unit root cannot be rejected for all markets during the crisis period. For the post crisis period, only Thailand market is stationary. To correct for the nonstationarity, the data has to be differenced once resulting in the rejection of the null hypothesis at 1 percent significance level for all markets. Therefore, the data series are said to be integrated of order 1 i.e. I(1) process.

Table 3 presents the results of correlation tests between the Asian markets. Although all markets are found to be positively correlated, the correlation levels however, are rather weak. The Malaysian market is correlated mainly with the Hong Kong, Indonesian, Singapore and Thailand markets. The correlation is stronger in the sub-period I or during the Asian crisis. This is attributable to investors' worries on the health of the stock markets in the region as a whole as the crisis heightened thus, triggering widespread selling of stocks in the region. When the crisis abated in sub-period II, the correlation level reduces allowing the affected countries to recover and improve their risk level. However, since the correlation levels are low, the test does not provide robust evidence that the Asian markets are indeed correlated particularly during the post Asian financial crisis. Among the Asian markets, Singapore has the highest correlation with the other markets especially with Hong Kong, Japan, the Philippines and Thailand markets indicating that Singaporean investors look at other regional markets considerably for leads. Nevertheless, the correlation test provides evidence that the Malaysian stock market has integrated with the regional markets and the correlation intensified especially during a crisis event.

We used Johansen cointegration test to further examine the regional integration and the result is shown in Table 4. The test reveals that the Malaysian stock market is particularly cointegrated with the Indonesian and Thailand markets. Cointegration also exists with the Hong Kong and Singapore markets during the full sample period as well as with the Japanese market during the crisis period. The strong cointegration with the

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[1] The daily return is calculated by taking the natural logarithm of prices between two time periods as follows:
$R_{it} = ln(P_{it}) - ln(P_{it-1})$.

Indonesian, Singapore and Thailand markets provides robust evidence of regional integration attributed mainly to the close geographical proximities. In addition, the result proves that all the crisis hit countries are indeed cointegrated during the crisis period.

Table 5a, 5b and 5c give the ECM test results. The tables reveal that the Malaysian stock market is strongly affected by the Indonesian, the Philippines and Thailand markets in all sub-periods. However, there is no evidence of bilateral causality between the Malaysian market with Indonesian and Thailand markets signifying that the local market does not affect the performance of its two neighbouring countries' stock markets. Instead, the Malaysian market is found to affect only the Philippines market during the full and crisis periods. The ECM test therefore, gives robust evidence that neighbouring markets has significant influence over the Malaysian market performance particularly during the crisis period. Nevertheless, the Malaysian market has strong influence over the Singapore stock market in all sub-periods but not *vice versa*. The dominant effect of the Malaysian market against the Singapore market is attributable to the close geographical proximity and some similarities possessed by the two neighbouring markets in terms of their market players[2] and trading hours[3]. The causality relationship is rather weak with respect to more distant stock markets as shown by the no causality effect between the Malaysian and Japanese market, and less than significant causality effect between the Malaysian and Hong Kong markets.

In summary, the results from various tests indicate the existence of regional market integration. Despite that all the seven Asian markets are positively correlated, the correlation level however, are rather modest and therefore, do not provide robust evidence of regional market integration. Instead, the Johansen cointegration test and the ECM test shows significant causality effect particularly among neighbouring markets. The regional market integration reflects the impact of the financial market globalisation where efficient flow of information and easy access to stock markets by local as well as foreign investors make price movements in a foreign market to have immediate effect on the direction of stock prices in the domestic market. Therefore, the performance of the domestic market is not just exclusively affected by local events but is also subjected to the developments in the international markets. The results also reveal that in the event of a crisis, the correlation and integration levels would increase significantly hence, affecting the performance of all stock markets in the region.

CONCLUSION

This study examines the nature of the dynamic relationship among stock markets within the same geographical area. Seven stock markets in the Asian region namely Malaysia, Hong Kong, Indonesia, Japan, the Philippines, Singapore and Thailand were studied. The study is based on the daily return of each of the stock market's main benchmark index, covering the period from July 1997 to December 2002. The period was further divided into two sub-periods comprising the period of during and after the Asian financial crisis. The period classification enables for a more thorough investigation on the nature of the dynamic relationship among the stock markets in each of the sub-periods. The analysis is carried out using the correlation test, the Johansen cointegration test and the error correction model (ECM).

Consistent with earlier studies, the results provide robust evidence of regional market integration. Both the correlation test and the Johansen cointegration test reveal that the Malaysian market has been well integrated with regional stock markets especially Indonesia, Singapore, Thailand as well as Hong Kong markets. The integration level increases during crisis event but is less significant otherwise as shown by the high correlation recorded in the midst of the Asian financial crisis. Meanwhile, the ECM test confirms that the integration is greater for stock markets that are closely located within the same geographical area as shown by the strong causality effect between the Malaysian market with Indonesia, the Philippines, Singapore and Thailand. However, the causality effect is less pronounces with other more distant stock markets such as Hong Kong and Japan.

The regional integration is prompted mainly by the globalisation of the world financial market, which makes the Malaysian stock market's return vulnerable to the performance of the regional markets. The findings are useful in helping investors making strategic investment decisions, especially those involving cross border investments, in view that the positive correlation between the Malaysian equity markets and its neighbouring stock markets requires investors to be equally alert on the latest developments in the regional markets.

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[2] Stock trading in Malaysia and Singapore is dominated mainly by the ethnic Chinese investors.
[3] Both Malaysia and Singapore are in the same time zone.

REFERENCES

Bekaert, G. and Harvey, C. R. (1995). "Time Varying Market Integration". *Journal of Finance,* 50, 403-444.

Bilson, C., Hooper, V. and Jaugietis, M. (2000). "The Impact of Liberalisation and Regionalism upon Capital Markets in Emerging Asian Economies". *International Finance Review,* 1, 219-255.

Cha, B. and Cheung, Y-L (1998). "The Impact of the U.S. and the Japanese Equity Markets on the Emerging Asia-Pacific Equity Markets". *Asia-Pacific Financial Markets Journal*, 5, 191-209.

Chen, G., Michael, F. and Rui, O. M. (2002). "Stock Market Linkages: Evidence from Latin America". *Journal of Banking & Finance*, 26, 1113-1141.

Cheung, Y.W, He, J. and Ng, L. K. (1997). "What are the Global Sources of Rational Variation in International Equity Returns?". *Journal of International Money and Finance*, 16(6), 821–836.

Darbar, S. M. and Deb, P. (1997). "Co-Movement in International Markets". *Journal of Financial Research*, 20, 305-318.

Dickey, D. A. and Fuller, W. A. (1979). "Distribution of the Estimators for Autoregressive Time Series with a Unit Root". *Journal of the American Statistical Association*, 74, 427-431.

Granger, C. W. J. (1969). "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods". *Econometrica*, 37, 424-438.

Gujarati, D. N. (2003). *Basic Econometrics*. Fourth Edition, New York: McGraw-Hill/Irwin.

Ibbotson. R. C., Carr, R. C. and Robinson, A. W. (1982). "International Equity and Bond Returns". *Financial Analyst Journal*, 38, 61-83.

Johansen, S. (1991). "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models". *Econometrica*, 59, 1551-1580.

Johansen, S. (1995). *Likelihood-based Inference in Cointegrated Vector Autoregressive Models*. Oxford University Press.

Johnson, R. and Soenen, L. (2002). "Asian Economic Integration and Stock Market Co-Movement". *Journal of Financial Research,* 25, 141-158.

Masih, A. M. and Masih, R. (1997). "Long and Short-Term Dynamic Interactions Between Major International Stock Markets and the Malaysian Stock Market". *MIER 1997 National Outlook Conference*. Kuala Lumpur: 2-3 December 1997.

Osterwald-Lenum, M. (1992). "A Note with Quantiles of the Asymptotic Distribution of the Maximum Likelihood Cointegration Rank Test Statistics". *Oxford Bulletin of Economics and Statistics*, 54, 461-472.

Ripley, D. M. (1973). "Systematic Elements in the Linkage of National Stock Market Indices". *Review of Economics and Statistics*, 55, 356-361.

Tsutsui, Y. and Hirayama, K. (1998). "Estimation of the Common and Country-Specific Shock to Stock Prices". *Discussion Paper in Economics and Management*, Osaka University No. 98-08.

Yong, O. (1990). "Inter-temporal Stability of the International Stock Market Relations: The Case of Malaysian Stock Market in Relation to World's Major Market". *Jurnal Pengurusan,* 9, 3-23.

Yong, O. (1992). "Co-Movement of International Stock Market from the Perspective of a Nonparametic Approach". *Jurnal Pengurusan,* 11, 63-73.

Table1: Data Description

	KLCI	STI	SET	PSI	JSE	NIKKEI	HSI
Full Period: 07/1997 to 12/2002							
Mean	-0.00036	-0.00027	-0.00039	-0.00070	-0.00039	-0.00059	-0.00033
Maximum	0.20817	0.12874	0.11350	0.16178	0.13128	0.07655	0.17247
Minimum	-0.24153	-0.16049	-0.10028	-0.09744	-0.12732	-0.07234	-0.14735
Std. Dev.	0.02182	0.01725	0.02068	0.01780	0.02090	0.01592	0.02065
Skewness	0.43002	-0.24141	0.55892	0.90142	0.13408	0.10519	0.21359
Kurtosis	30.2234	13.4129	6.4944	15.0000	9.0028	4.8250	11.1868
Sub-Period I: 07/1997 to 06/1999							
Mean	-0.00055	0.00019	-0.00033	-0.00019	-0.00020	-0.00027	-0.00021
Maximum	0.20817	0.12874	0.11350	0.09666	0.13128	0.07655	0.17247
Minimum	-0.24153	-0.09154	-0.10028	-0.09744	-0.12732	-0.05957	-0.14735
Std. Dev.	0.03197	0.02126	0.02664	0.02236	0.02804	0.01672	0.02674
Skewness	0.50126	0.46635	0.80132	0.06826	0.33949	0.17555	0.37120
Kurtosis	17.3648	7.7648	5.2945	5.5311	6.3564	4.9596	9.6566
Sub-Period II: 07/1999 to 12/2002							
Mean	-0.00024	-0.00053	-0.00042	-0.00098	-0.00049	-0.00077	-0.00040
Maximum	0.06573	0.07514	0.05342	0.16178	0.05356	0.07222	0.05434
Minimum	-0.12566	-0.16049	-0.07346	-0.09390	-0.10933	-0.07234	-0.09285
Std. Dev.	0.01286	0.01448	0.01635	0.01457	0.01543	0.01546	0.01620
Skewness	-0.94979	-1.54510	-0.20911	2.35919	-0.68240	0.04811	-0.27802
Kurtosis	16.3189	21.6810	4.8301	35.1328	8.0899	4.6631	5.5669

Notes:
KLCI   - Kuala Lumpur Stock Exchange (Malaysia)
STI   - Straits Times Industrial Index (Singapore)
SET   - SET Index (Thailand)
PSI   - Philippines Stock Index (Philippines)
JSE   - JSE Index (Indonesia)
NIKKEI   - 225-shares Nikkei Industrial Average (Japan)
HSI   - Hang Seng Index (Hong Kong)

Table 2: Unit Root Test

Markets	Full Period		Sub-Period I		Sub-Period II	
	LY	DLY	LY	DLY	LY	DLY
KLCI	-2.487	-20.296***	-1.943	-12.194***	-1.725	-16.026***
STI	-1.665	-19.872***	-1.061	-11.393***	-1.069	-16.897***
SET	-2.830*	-20.225***	-1.618	-12.266***	-2.804*	-15.720***
PSI	-1.649	-21.632***	-1.772	-12.525***	-2.111	-18.135***
JSE	-2.963**	-20.704***	-2.038	-12.493***	-2.080	-16.433***
NIKKEI	-0.616	-23.158***	-2.154	-14.641***	-0.439	-17.903***
HSI	-1.647	-20.171***	-1.587	-11.616***	-0.783	-17.077***

Notes: *, **, *** are 10%, 5% and 1% significance levels. All variable are estimated in logarithm form. L = logarithm, and D = first-difference operator. Optimum lag is selected based on the Akaike Information Criterion (AIC).

Table 3: Correlation Matrix

Markets	KLCI	STI	SET	PSI	JSE	NIKKEI	HSI
	Full Period: 07/1997 to 12/2002						
KLCI	1.0000						
STI	0.3852**	1.0000					
SET	0.3155**	0.4486**	1.0000				
PSI	0.2108**	0.4000**	0.3238**	1.0000			
JSE	0.2731**	0.3817**	0.3441**	0.3186**	1.0000		
NIKKEI	0.2088**	0.3512**	0.2309**	0.1832**	0.1901**	1.0000	
HSI	0.3300**	0.5839**	0.3747**	0.3439**	0.3281**	0.4316**	1.0000
	Sub-Period I: 07/1997 to 06/1999						
Markets	KLCI	STI	SET	PSI	JSE	NIKKEI	HSI
KLCI	1.0000						
STI	0.3972**	1.0000					
SET	0.3425**	0.4929**	1.0000				
PSI	0.2129**	0.5259**	0.3944**	1.0000			
JSE	0.2986**	0.4500**	0.4212**	0.3960**	1.0000		
NIKKEI	0.2168**	0.2707**	0.2209**	0.1794**	0.2160**	1.0000	
HSI	0.3557**	0.6102**	0.4053**	0.4446**	0.4132**	0.4017**	1.0000
	Sub-Period II: 07/1999 to 12/2002						
Markets	KLCI	STI	SET	PSI	JSE	NIKKEI	HSI
KLCI	1.0000						
STI	0.3972**	1.0000					
SET	0.2713**	0.3880**	1.0000				
PSI	0.2239**	0.2381**	0.2224**	1.0000			
JSE	0.2173**	0.2826**	0.2148**	0.1979**	1.0000		
NIKKEI	0.2415**	0.4315**	0.2500**	0.1919**	0.1744**	1.0000	
HSI	0.2895**	0.5498**	0.3274**	0.1989**	0.1832**	0.4813**	1.0000

Notes: ** - Correlation is significant at the 1% level

Table 4: Johansen Cointegration Test

Markets	KLCI					
	Full Period		Sub-Period I		Sub-Period II	
	r	Trace Test LR	r	Trace Test LR	r	Trace Test LR
STI	r = 0	20.240**	r = 0	13.239	r = 0	8.561
	r ≤ 1	2.820	r ≤ 1	1.101	r ≤ 1	1.300
SET	r = 0	14.533	r = 0	26.648**	r = 0	14.754
	r ≤ 1	5.650	r ≤ 1	2.635	r ≤ 1	4.810*
PSI	r = 0	8.622	r = 0	10.640	r = 0	8.413
	r ≤ 1	0.978	r ≤ 1	3.335	r ≤ 1	3.833
JSE	r = 0	17.194*	r = 0	11.703	r = 0	17.784*
	r ≤ 1	6.471*	r ≤ 1	3.970*	r ≤ 1	5.337*
NIKKEI	r = 0	6.484	r = 0	10.722	r = 0	4.841
	r ≤ 1	0.150	r ≤ 1	3.808*	r ≤ 1	0.187
HSI	r = 0	15.872*	r = 0	17.215*	r = 0	5.362
	r ≤ 1	2.906	r ≤ 1	2.769	r ≤ 1	0.569

Notes: *, ** are 5% and 1% significance levels, r = cointegrating vectors for null hypothesis, and LR = Likelihood Ratio.

Table 5a: Error Correction Model (Full Period)

KLCI (LY) and STI (LX) **(Bilateral Causality)**
$DLY_t = -0.0003 + 0.005DLY_{t-1} + 0.046DLY_{t-2} + 0.061DLX_{t-1} - 0.024DLX_{t-2} - 0.020e_{t-1}$
       (-0.565)   (0.181)   (1.618)   (1.655)   (-0.662)   (3.877***)
      $R^2 = 0.015$ s.e.e. = 0.022   F = 1.494   LM(2) = 1.053

$DLX_t = -0.0002 + 0.022DLY_{t-1} + 0.065DLY_{t-2} + 0.128DLX_{t-1} - 0.046DLX_{t-2} - 0.0002e_{t-1}$
       (-0.497) (0.967)   (2.906)   (4.441)   (-1.611)   (-0.046)
      $R^2 = 0.026$ s.e.e. = 0.017   F = 4.645***   LM(2) = 3.225

KLCI (LY) and SET (LX) **(SET Granger Cause KLCI)**
$DLY_t = -0.0003 - 0.012DLY_{t-1} + 0.008DLY_{t-2} + 0.081DLX_{t-1} + 0.094DLX_{t-2}$
       (-0.474) (-0.426)   (0.292)   (2.742)   (3.182)
      $R^2 = 0.015$ s.e.e. = 0.022   F = 9.423***   LM(2) = 0.181

$DLX_t = -0.0003 + 0.016DLY_{t-1} + 0.010DLY_{t-2} + 0.091DLX_{t-1} + 0.036DLX_{t-2}$
       (-0.625) (0.626)   (0.379)   (3.279)   (1.310)
      $R^2 = 0.012$ s.e.e. = 0.021   F = 0.265   LM(2) = 4.015

KLCI (LY) and PSI (LX) **(Bilateral Causality)**
$DLY_t = -0.0002 - 0.003DLY_{t-1} + 0.020DLY_{t-2} + 0.105DLX_{t-1} + 0.048DLX_{t-2}$
       (-0.397) (-0.095)   (0.719)   (3.122)   (1.444)
      $R^2 = 0.011$ s.e.e. = 0.022   F = 6.555***   LM(2) = 3.139

$DLX_t = -0.0006 + 0.092DLY_{t-1} + 0.027DLY_{t-2} + 0.144DLX_{t-1} - 0.067DLX_{t-2}$
       (-1.299) (4.255)   (1.219)   (5.330)   (-2.485)
      $R^2 = 0.042$ s.e.e. = 0.017   F = 9.686***   LM(2) = 1.778

KLCI (LY) and JSE (LX) **(JSE Granger Cause KLCI)**
$DLY_t = -0.0003 - 0.016DLY_{t-1} + 0.012DLY_{t-2} + 0.103DLX_{t-1} + 0.094DLX_{t-2} - 0.009e_{t-1}$
       (-0.472) (-0.571)   (0.453)   (3.575)   (3.259)   (-2.481)
      $R^2 = 0.027$ s.e.e. = 0.022   F = 13.302***   LM(2) = 1.377

$DLX_t = -0.0003 + 0.006DLY_{t-1} - 0.019DLY_{t-2} + 0.161DLX_{t-1} - 0.005DLX_{t-2} + 0.003e_{t-1}$
       (-0.606) (0.228)   (-0.717)   (5.824)   (-0.164)   (0.432)
      $R^2 = 0.026$ s.e.e. = 0.021   F = 0.286   LM(2) = 0.570

KLCI (LY) and NIKKEI (LX) **(No Causality)**
$DLY_t = -0.0003 + 0.017DLY_{t-1} + 0.020DLX_{t-1}$
       (-0.577) (0.615)   (0.537)
      $R^2 = 0.0006$ s.e.e. = 0.022   F = 0.289   LM(1) = 1.420

$DLX_t = -0.0006 + 0.033DLY_{t-1} - 0.015DLY_{t-2} - 0.066DLX_{t-1} - 0.049DLX_{t-2}$
       (-1.507) (1.683)   (-0.767)   (-2.445)   (-1.825)
      $R^2 = 0.008$ s.e.e. = 0.016   F = 1.701   LM(2) = 1.441

KLCI (LY) and HSI (LX) **(HSI Granger Cause KLCI)**
$DLY_t = -0.0003 - 0.006DLY_{t-1} + 0.043DLY_{t-2} + 0.085DLX_{t-1} - 0.010DLX_{t-2} - 0.015e_{t-1}$
       (-0.547) (-0.200)   (1.523)   (2.883)   (-0.350)   (-3.575***)
      $R^2 = 0.018$ s.e.e. = 0.022   F = 4.264**   LM(2) = 1.144

$DLX_t = -0.0003 + 0.023DLY_{t-1} - 0.003DLX_{t-1} - 0.002e_{t-1}$
       (-0.566) (0.858)   (-0.109)   (-0.597)
      $R^2 = 0.0008$ s.e.e. = 0.021   F = 0.736   LM(1) = 0.143

Notes: *, **, *** are 10%, 5% and 1% significance levels. F = F-Granger statistic, s.e.e. = standard error of estimation, LM = Breusch-Godfrey Lagrange Multiplier for serial correlation test and t-statistic in parentheses. Optimum lags are selected base on the Akaike Information Criterion (AIC).

Table 5b: Error Correction Model (Sub-Period I)

KLCI (LY) and STI (LX) **(KLCI Granger Cause STI)**

$DLY_t = -0.0006 - 0.047DLY_{t-1} + 0.031DLY_{t-2} + 0.120DLX_{t-1} + 0.026DLX_{t-2}$
         (-0.392) (-0.966)   (0.647)   (1.623)   (0.354)
         $R^2 = 0.009$ s.e.e. = 0.032   F = 1.506   LM(2) = 1.479

$DLX_t = 0.0002 + 0.052DLY_{t-1} + 0.086DLY_{t-2} + 0.179DLX_{t-1} - 0.062DLX_{t-2}$
         (0.230) (1.685)   (2.770)   (3.730)   (-1.311)
         $R^2 = 0.065$ s.e.e. = 0.021   F = 4.926***   LM(2) = 1.499

KLCI (LY) and SET (LX) **(SET Granger Cause KLCI)**

$DLY_t = -0.0005 - 0.019DLY_{t-1} + 0.036DLY_{t-2} + 0.048DLX_{t-1} + 0.069DLX_{t-2} - 0.078e_{t-1}$
         (-0.375) (-0.400)   (0.777)   (0.851)   (1.224)   (-4.436***)
         $R^2 = 0.055$ s.e.e. = 0.031   F = 1.163   LM(2) = 3.818

$DLX_t = -0.0003 + 0.009DLY_{t-1} + 0.023DLY_{t-2} + 0.133DLX_{t-1} + 0.004DLX_{t-2} + 0.007e_{t-1}$
         (-0.250) (0.224)   (0.601)   (2.776)   (0.093)   (0.457)
         $R^2 = 0.020$ s.e.e. = 0.026   F = 0.197   LM(2) = 2.061

KLCI (LY) and PSI (LX) **(Bilateral Causality)**

$DLY_t = -0.0005 - 0.053DLY_{t-1} + 0.005DLY_{t-2} + 0.171DLX_{t-1} + 0.147DLX_{t-2}$
         (-0.342) (-1.176)   (0.116)   (2.603)   (2.254)
         $R^2 = 0.029$ s.e.e. = 0.032   F = 6.950***   LM(2) = 0.305

$DLX_t = -0.0001 + 0.113DLY_{t-1} + 0.036DLY_{t-2} + 0.182DLX_{t-1} - 0.098DLX_{t-2}$
         (-0.110) (3.677)   (1.148)   (4.052)   (-2.206)
         $R^2 = 0.074$ s.e.e. = 0.022   F = 7.148***   LM(2) = 0.225

KLCI (LY) and JSE (LX) **(JSE Granger Cause KLCI)**

$DLY_t = -0.0005 - 0.084DLY_{t-1} - 0.002DLY_{t-2} + 0.176DLX_{t-1} + 0.168DLX_{t-2}$
         (-0.367) (-1.836)   (-0.050)   (3.373)   (3.176)
         $R^2 = 0.050$ s.e.e. = 0.031   F = 12.709***   LM(2) = 0.531

$DLX_t = -0.0002 - 0.012DLY_{t-1} - 0.026DLY_{t-2} + 0.209DLX_{t-1} - 0.006DLX_{t-2}$
         (-0.164) (-0.300)   (-0.645)   (4.533)   (-0.135)
         $R^2 = 0.042$ s.e.e. = 0.028   F = 0.242   LM(2) = 0.756

KLCI (LY) and NIKKEI (LX) **(KLCI Granger Cause NIKKEI)**

$DLY_t = -0.0005 - 0.017DLY_{t-1} + 0.031DLX_{t-1}$
         (-0.385) (-0.383)   (0.359)
         $R^2 = 0.0004$ s.e.e. = 0.032   F = 0.129   LM(1) = 0.485

$DLX_t = -0.0003 + 0.053DLY_{t-1} + 0.007DLY_{t-2} - 0.116DLX_{t-1} - 0.105DLX_{t-2}$
         (-0.342) (2.278)   (-0.767)   (-2.560)   (-2.342)
         $R^2 = 0.027$ s.e.e. = 0.017   F = 2.619*   LM(2) = 0.595

KLCI (LY) and HSI (LX) **(HSI Granger Cause KLCI)**

$DLY_t = -0.0005 - 0.055DLY_{t-1} + 0.046DLY_{t-2} + 0.138DLX_{t-1} - 0.017DLX_{t-2} - 0.043e_{t-1}$
         (-0.391) (-1.162)   (0.982)   (2.431)   (-0.301)   (-3.671***)
         $R^2 = 0.047$ s.e.e. = 0.031   F = 3.111**   LM(2) = 0.177

$DLX_t = -0.0002 + 0.038DLY_{t-1} - 0.023DLX_{t-1} - 0.001e_{t-1}$
         (-0.137) (0.959)   (-0.485)   (-0.102)
         $R^2 = 0.002$ s.e.e. = 0.027   F = 0.919   LM(1) = 1.216

Notes: *, **, *** are 10%, 5% and 1% significance levels. F = F-Granger statistic, s.e.e. = standard error of estimation, LM = Breusch-Godfrey Lagrange Multiplier for serial correlation test and t-statistic in parentheses. Optimum lags are selected base on the Akaike Information Criterion (AIC).

Table 5c: Error Correction Model (Sub-Period II)

KLCI (LY) and STI (LX) **(KLCI Granger Cause STI)**

$DLY_t = -0.0003 + 0.150DLY_{t-1} + 0.002DLY_{t-2} - 0.018DLX_{t-1} - 0.050DLX_{t-2}$
　　　　(-0.673)　(4.113)　　　(0.046)　　　　(-0.546)　　　(-1.560)
　　　　$R^2 = 0.023$　s.e.e. = 0.013　F = 1.451　LM(2) = 0.768

$DLX_t = -0.0006 - 0.096DLY_{t-1} - 0.003DLY_{t-2} + 0.078DLX_{t-1} - 0.030DLX_{t-2}$
　　　　(-1.152)　(-2.320)　　　(-0.082)　　　　(2.137)　　　(-0.836)
　　　　$R^2 = 0.009$　s.e.e. = 0.014　F = 2.826*　LM(2) = 0.728

KLCI (LY) and SET (LX) **(SET Granger Cause KLCI)**

$DLY_t = -0.0002 + 0.125DLY_{t-1} + 0.044DLX_{t-1}$
　　　　(-0.559)　(3.660)　　　(1.656)
　　　　$R^2 = 0.023$　s.e.e. = 0.013　F = 2.741*　LM(2) = 0.080

$DLX_t = -0.0004 + 0.018DLY_{t-1} - 0.027DLY_{t-2} + 0.042DLX_{t-1} + 0.085DLX_{t-2}$
　　　　(-0.722)　(0.395)　　　(-0.606)　　　　(1.225)　　　(2.452)
　　　　$R^2 = 0.009$　s.e.e. = 0.016　F = 0.236　LM(2) = 0.723

KLCI (LY) and PSI (LX) **(PSI Granger Cause KLCI)**

$DLY_t = -0.0003 + 0.143DLY_{t-1} + 0.0001DLY_{t-2} - 0.002DLX_{t-1} - 0.073DLX_{t-2}$
　　　　(-0.770)　(4.190)　　　(0.002)　　　　(-0.056)　　　(-2.453)
　　　　$R^2 = 0.027$　s.e.e. = 0.013　F = 3.051**　LM(2) = 1.728

$DLX_t = -0.0010 + 0.027DLY_{t-1} - 0.004DLY_{t-2} + 0.097DLX_{t-1} - 0.036DLX_{t-2}$
　　　　(-2.014)　(0.684)　　　(-0.108)　　　　(2.852)　　　(-1.067)
　　　　$R^2 = 0.012$　s.e.e. = 0.015　F = 0.234　LM(2) = 3.402

KLCI (LY) and JSE (LX) **(JSE Granger Cause KLCI)**

$DLY_t = -0.0003 + 0.152DLY_{t-1} - 0.008DLY_{t-2} - 0.032DLX_{t-1} - 0.023DLX_{t-2} - 0.016e_{t-1}$
　　　　(-0.651)　(4.471)　　　(-0.235)　　　　(-1.127)　　　(-0.028)　　(-3.439***)
　　　　$R^2 = 0.034$　s.e.e. = 0.013　F = 1.031　LM(2) = 2.708

$DLX_t = -0.0004 + 0.055DLY_{t-1} + 0.004DLY_{t-2} + 0.070DLX_{t-1} - 0.015DLX_{t-2} - 0.005e_{t-1}$
　　　　(-0.875)　(1.326)　　　(0.107)　　　　(2.038)　　　(-0.429)　　(-0.865)
　　　　$R^2 = 0.010$　s.e.e. = 0.015　F = 0.920　LM(2) = 3.665

KLCI (LY) and NIKKEI (LX) **(No Causality)**

$DLY_t = -0.0003 + 0.141DLY_{t-1} - 0.002DLX_{t-1}$
　　　　(-0.595)　(4.155)　　　(-.059)
　　　　$R^2 = 0.020$　s.e.e. = 0.013　F = 0.003　LM(1) = 0.294

$DLX_t = -0.0009 - 0.017DLY_{t-1} - 0.071DLY_{t-2} - 0.034DLX_{t-1} - 0.010DLX_{t-2}$
　　　　(-1.691)　(-0.419)　　　(-1.694)　　　　(-0.993)　　　(-0.302)
　　　　$R^2 = 0.006$　s.e.e. = 0.015　F = 1.662　LM(2) = 0.159

KLCI (LY) and HSI (LX) **(KLCI Granger Cause HSI)**

$DLY_t = -0.0003 + 0.155DLY_{t-1} - 0.022DLY_{t-2} - 0.033DLX_{t-1} + 0.003DLX_{t-2}$
　　　　(-0.627)　(4.453)　　　(0.629)　　　　(-1.187)　　　(0.119)
　　　　$R^2 = 0.022$　s.e.e. = 0.013　F = 0.706　LM(2) = 0.519

$DLX_t = -0.0005 - 0.017DLY_{t-1} - 0.102DLY_{t-2} + 0.024DLX_{t-1} - 0.010DLX_{t-1}$
　　　　(-0.938)　(-0.387)　　　(-2.304)　　　　(0.693)　　　(-0.294)
　　　　$R^2 = 0.008$　s.e.e. = 0.016　F = 2.944*　LM(1) = 3.541

Notes: *, **, *** are 10%, 5% and 1% significance levels. F = F-Granger statistic, s.e.e. = standard error of estimation, LM = Breusch-Godfrey Lagrange Multiplier for serial correlation test and t-statistic in parentheses. Optimum lags are selected base on the Akaike Information Criterion (AIC).

Stock Price and Exchange Rate:
An Application of Granger Non-causality Test

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ABSTRACT

This paper examines the presence of causal relationship between the stock price and exchange rate in the Malaysian financial market. Having established the stationarity condition of each series using ADF, PP and KPSS unit root tests, the causal linkages were examined using the Granger non-causality test prescribed by Toda and Yamamoto (1995). Among the finding of interest, there exist feedback interaction between exchange rate and stock price before the recent Asian financial crisis. However, the exchange rate lead stock price during the crisis.

INTRODUCTION

The collapse of Bretton woods system in 1971 and the failure of the Smithsonian agreement have set a new regime for floating exchange rate. Under the pure floating system and without government intervention, the levels of exchange rate are determined solely by market forces. During the floating exchange rate regime, there was considerable movement in exchange rates as well as stock prices have been witnessed around the world. These movements have been described as excessively volatile. One possible explanation for this condition is that both exchange rates and stock prices have diverged from market fundamentals (Shiller, 1984; Williamson, 1985).

Following the dismantlement of currency link to the sterling area management in 1972, the Malaysian ringgit (MYR) was allowed to float freely. At the same time, regulations on capital transaction with all foreign countries were substantially liberalized. Unlike the Thai bath, ringgit was not officially fixed to the US dollar during the floating exchange rate regime. Instead, the narrow trading band around the rate of MYR2.50 per US dollar was determined by the underlying demand and supply. Any day-to-day volatility in the exchange rate was occasionally moderated by Bank Negara Malaysia (the central bank of Malaysia) through minimal intervention. For a long time, Malaysian government had always believed on the exchange rate stability due to its important contributions to the development and growth of business sector.

Behind the currency stability, Malaysia had been enjoying a rapid economic growth for a long time. Before the onset of the crisis in July 1997, the growth of real Gross Domestic Product (GDP) for ten consecutive years had been around 8.5% per annum (BNM, 1999). As a result, the stock market was also growing rapidly, indicating firms' future profitability nearly assured. During 1993 to 1994, there had been huge amount of inflows of long-term capital as well as short-term capital to the country. While the average annual net inflow of total long-term private capital during the period 1990-1993 was about MYR9.5 billion a year, the short-term capital was about MYR8 billion a year (BNM, 1999). This condition was mainly attributed to a number of different factors such as the relaxation of control on capital movements and foreign exchange transactions, improvement in computer and communication technology and expansion in the operations of major multinational corporations (MNC).

Eventually, an overflow of short-term capital had led to an overheated stock market and asset prices leading to the fragility of financial system. In 1997, the depreciated Thai bath had worsened the situation by triggering a wave of currency depreciation and stock market declines. According to Moreno et al. (1998), after the second half of 1997, the value of the most affected East Asian currencies had fallen between 33% and 37% against the US dollar. In the case of Malaysia, between June 1997 and December 1998, the ringgit depreciated by 33.6 % against US dollar and reached the historic low of MYR4.88 to a US dollar on January 7, 1998. From February through June 1998, the value of the ringgit was relatively stable between MYR3.84 and MYR3.98 per US dollar. From June to August 1998, the downward pressure on the ringgit intensified following the depreciation of the Japanese Yen, the contraction in the domestic economy and increased speculative activity. To stabilize the exchange rate, the initiative was taken on 1 September 1998 to impose selective exchange controls and to fix the exchange rate at MYR3.80 to the US dollar on 2 September 1998. This represented 34% depreciation from the level prevailing prior to the crisis.

The immediate impact of the ringgit depreciation was on the stock market, with the Kuala Lumpur Composite Index (KLCI) declined by 44.8% in the second half of 1997. As the contagion spread in the region, investor confidence was further eroded. The reversal of short-term capital flows caused the ringgit to depreciate further by as much as 20% on 7 January 1998 and the KLCI to decline to a low of 286 points on 1 September 1998. This vicious cycle culminated in the recession of 1998.

The main purpose of this study is to empirically determine the causal relation between the exchange rate and stock price using Malaysian data. Our study focuses on the macro level issues and contributes to the literature in the following ways. First, the paper utilizes daily data to analyze the relationship between stock price and exchange rate. It is well known that the use of lower frequency data such as weekly and monthly observations may not be adequate to capture the dynamics of exchange rate and stock price. It has been shown that significant interaction between the two series have been diluted in data of lower frequency. The use of daily data in this study is hoped to provide more invaluable insights on the relationship between the exchange rate and stock price. Second, it considers both bivariate and multivariate model. The majority of earlier empirical works have focused on the bivariate model. It should be stressed that the use of incomplete system which fails to account for other important variable, may end up with spurious result. It is shown that the lack of causal relationship in previous studies might be because of the omission of important variable, which serves as a channel through which the exchange rate and stock price are linked. Finally, this study utilizes recent causality methodology which allow causal inferences to be conducted in a system including time series processes that may be integrated as well as cointegrated. Recent development in econometrics on the properties of time series has enable researchers to investigate the relationship between integrated economic variables with ease and can provide precise estimates, in the sense the spurious regression problems can be avoided. The Granger non-causality analysis proposed by Toda and Yamamoto (1995) provide a simplistic approach in gauging causal relations having to worry about the order of integration and/or the cointegration rank in a VAR system.

The paper attempts to answer the following questions. What is the direction of causality between the stock price and exchange rate? Has the relationship changed in the recent years following the eruption of financial crisis in 1997? What has been the effect of this crisis on the relationship? What is the impact of world market on this relationship? Apart from providing insight into the theoretical matters of interest, such as informational efficient market hypothesis, the answers to these questions will have important policy implications for designing exchange rate and stock market policies.

The rest of the paper unfolds as follows. Section II highlights some of the previous findings. The data and estimating model are discussed in sections III and IV respectively. The results of empirical test are discussed in Section V. The final section concludes.

EXCHANGE RATES AND STOCK PRICES

Theoretically, there are two contrasting views on the linkages between stock price and exchange rates. On one hand, classical economist believe that the currency appreciation under the floating exchange rate regime will affect the international competitiveness of local product and trade balance position of the nation.[1] Eventually the future cash flows are affected due to real output deterioration and result in lower stock price. Generally, this model suggests that the exchange rates lead stock price with positive correlation.

On the other hand, the proponents of 'portfolio-balance' model believe that the stock prices may lead exchange rates with negative correlation. Equity being part of wealth, may affect the exchange rates through demand for money. For example, higher stock price may result in higher demand for money with ensuring higher interest rate. In turn, this condition will attract foreign capital flow to the country resulting in appreciation of local currency.

Earlier empirical researches (see e.g., Frank and Young, 1972; Ang and Ghalap, 1976) into gauging the linkages between the exchange rate and the stock price in developed market (especially US market) have mainly focused on the exposure of MNCs stock prices to the exchange rate volatility. For example, Frank and Young (1972) examination on the U.S. MNCs finds that there is no recognizable pattern of stock price reaction to the exchange rate. Complementing this study, Ang and Ghalap (1976) who examined fifteen US MNCs conclude that the stock market is efficient and adjust rapidly to the changes in exchange rate. However, empirical examinations of the relation between stock return and exchange rate during the flexible exchange regime have largely provided mixed evidence (see e.g., Mok 1993; Bahmani-Oskoee and Sohrabian, 1992; Smith, 1992). For example, Bahmani-Oskoee and Sohrabian (1992) conclude that there is feedback interaction between US stock price and exchange rate. This finding is consistent with Mok's (1993) study on Hong Kong. In contrast, Smith (1992) finds that the stock returns have significant influence on exchange rate in Germany, Japan and the United states. In addition, Granger et al. (2000) find that the exchange rate lead stock price in Japan and Hong Kong for period of January 95 to November 97 and January 86 to November 87 respectively.

In the case of emerging market, Abdalla and Murinde (1997) investigate the interactions between the exchange rates and stock prices in the financial market of India, South Korea, Pakistan and the Philippines. Employing the monthly data in a form of bivariate vector autoregressive (VAR) model, the analysis over the period from January 1985 to July 1994 supports the "flow-oriented" model such that exchange rate changes lead stock prices in India, Pakistan and South Korea. In the case of the Philippines market, the stock price takes the lead. In contrast, Granger et al. (2000) who used daily data over the period January 1987 to December 1994 find that the exchange rate leads stock price and the a bi-directional causality exist in the Korea financial market for January 1995 to November 1997 period. Furthermore, the feedback interaction also exists for data from Indonesia and Malaysia whereas the result on Taiwan market indicates that the stock price contain predictive power.

In a sectoral study on Malaysian equity market, Amain and Law (2000) conclude that the exchange rate contains predictive power about future stock return movement. This evidence is particularly significant during the weak ringgit period (i.e. July 1997 until July 1998). Ten sectoral equity indices were utilized over the period of September 1993 to July 1998 employing weekly closing prices. As for the strong ringgit period (September, 1993 to January, 1997), there is no definite relation between exchange rate and stock price. However, the application of regression analysis does not allow causal relation to be tested.

As far as the model specification is concerned, previous macroeconomic studies have used a simple bivariate model. It should be pointed out that the approach of using a simple bivariate model in the causality test without considering the effects of other variables are subject to possible mispecification bias. The omission of important variables may lead to type 'I' and type 'II' errors, that is, spurious rejection of causal relationship as well as spurious detection of it. In a macroeconomic framework, the relationship between exchange rate and stock prices can best be captured by including other variables (see for example, Smith, 1992). Therefore, in addition to bivariate analysis, we estimate the multivariate model by including US stock price. The inclusion of US stock price in the multivariate model will increase the robustness of estimation by allowing them to exert its potential influence on Malaysian stock prices and exchange rates.

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[1] For example 'flow-oriented' model by Dornbusch and Fisher (1980).

DATA

Daily data set for exchange rate and stock price covering January 1993 to August 1998 were utilized. The advantage of using daily data is that it may better capture the dynamics of equity and exchange rate market interaction, whereas any significant interaction between the two series may have been diluted in data of lower frequency. The starting date indicates the availability of the exchange rate data and the period after August 1998 is avoided due to the imposition of capital control which completely closed the financial market to foreigner. End of day spot bilateral exchange rates vis-à-vis US dollar are utilized.[2] The capitalization-weighted Kuala Lumpur Composite Index (KLCI) is used to proxy Malaysian stock price. The index is based on the stock prices of 100 companies traded in Kuala Lumpur Stock Exchange (KLSE) and has a base value of 95.83 as of January 3, 1977. The S&P 500 index represents the US stock market. In order to better understand the relationship between stock price and exchange rate, the sample period is divided into two sub-samples. Period 1 (Pre-crisis period) cover from January 1993 to December 1996 and Period 2 (crisis period) continued from January 1997 through August 1998. After adjusting for the missing data and non-trading activities, a total number of 1378 observations for each series are available for analysis. All data were collected from Investor Digest and Monthly Statistical Bulletin published by KLSE and BNM respectively. Prior to the analysis, the data were converted into natural logarithm.

THE ESTIMATING MODEL

It is well known that in the context of integrated series, the conventional application of the F-test (i.e. in a standard VAR model) is invalid[3]. Moreover, the F-test is not valid unless the variables are cointegrated in levels. Recently an alternative approach which utilizes the Modified WALD (MWALD) test for testing linear restriction on the parameters was proposed by Toda and Yamamoto (1995). This test has an asymptotic χ^2 distribution when a VAR $(k + d_{max})$ is estimated where d_{max} is the maximum degree of integration suspected to occur in the system. Therefore, the Toda-Yamamoto causality procedure is viewed as a long-run causality test. Toda and Yamamoto (1995) point out that, for d=1, the lag selection procedure is always valid since $k \geq 1=d$. If d=2, then the procedure is valid unless k=1. Moreover, the MWALD statistic is valid regardless whether a series is I(0), I(1) or I(2), non-cointegrated or cointegrated of an arbitrary order. In addition, Zapata and Rambaldi (1997) provide evidence that the MWALD test has a comparable performance in size and power to the LR and WALD tests if (i) the correct number of lags for estimating $k + d_{max}$ is identified and (ii) no important variables are omitted, provided a sample of 50 observations is available.

Rambaldi and Doran (1996) have demonstrated that the MWALD procedure for testing Granger non-causality can be easily constructed using a Seemingly Unrelated Regression (SUR). Following Toda and Yamamoto (1995) Granger non-causality test, these variables can be causally linked in a system of two-variable, with 3-order VAR as follows[4]:

$$\begin{bmatrix} SP_t \\ EX_t \end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix} SP_{T-1} \\ EX_{t-1} \end{bmatrix} + \alpha_2 \begin{bmatrix} SP_{t-2} \\ EX_{t-2} \end{bmatrix} + \alpha_3 \begin{bmatrix} SP_{t-3} \\ EX_{t-3} \end{bmatrix} + \alpha_4 \begin{bmatrix} e_{SP} \\ e_{EX} \end{bmatrix} \tag{1}$$

where α_0 is an identity matrix and $E(\varepsilon_t) = \begin{bmatrix} \varepsilon_{SP_t} \varepsilon_{EX_t} \end{bmatrix} = 0$ and $E(\varepsilon_t \varepsilon_t') = \Sigma$. For example, if k=2 and d_{max}=1, a causality from EX to SP can be established through rejecting the null of EX_{t-1} and EX_{t-2} are jointly equal to zero in the first equation of the above system. A similar procedure can be used to test the causality from SP to EX by establishing a significance of the MWALD statistic for a group of lagged SP variables in the second equation of the system.

EMPIRICAL RESULTS

Prior to testing the non-causality test, it is necessary to determine the degree of integration of stock market indices and exchange rates. The two commonly used tests of unit root are Dickey-Fuller (DF) and Phillip-Perron (1988) (PP) tests. In both tests, the null hypothesis is that a unit root exists in the autoregressive representation

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[2] The exchange rate is expressed in Malaysian ringgit per unit of US dollar.
[3] Spurious regression due to non-standard distribution of the test statistics, see Toda and Phillips (1993).
[4] SP = stock prices; EX= exchange rates

of the time series. The DF type test attempts to account for temporally dependent and heterogeneously distributed errors by including lagged sequences of first differences of the variable in its set of regressors. The Augmented Dickey-Fuller (ADF) (Said and Dickey, 1984) test is an extension of the DF test by allowing a higher order of autoregressive process. The semi-parametric PP type tests try to account for dependent and IID processes through adopting a non-parametric adjustment, hence eliminating any nuisance parameters.

However, as evident in Schwert (1987) and DeJong et al. (1992), these tests tend to accept the null of unit root too frequently against a stationary alternative due to lack of power. Therefore the failure to reject a unit root may be simply due to low power of the standard unit root test (Masih and Masih, 1999). In addition, Stock (1995) points out that nuisance parameters such as the largest autoregressive root are quite typical of financial time series. Due to the growing controversy surrounding the specific test to employ, we complement the ADF and PP tests with mean stationary test proposed by Kwiatkowski et al. (1992) (KPSS). The KPSS test is based on the following statistic

$$\eta(u) = (1/T^2) \sum_{t=1}^{T} S_t^2 / \sigma_k^2, \text{ where } S_t = \sum_{i=1}^{t} v_t, \text{ t=1,.....T.} \tag{2}$$

where v_t is the residual term from a regression of y_t on an intercept, and σ_t^2 is a consistent long-run estimate of y_t, and T represents the sample size. If the computed value of $\eta(u)$ is larger than the critical value, then the null hypothesis of stationarity is rejected. We consider a variable to contain a unit root or be unit-root non-stationary if the null hypothesis of unit root is not rejected by the ADF and PP tests but the null hypothesis that the variable is mean stationary is rejected by the KPSS test.

The results of unit root tests reported in Table 1 indicate that the level of each series is nonstationary. Using the ADF, PP and KPSS test without trend, we found that for all series the hypothesis of level non-stationarity cannot be rejected. However, results for first-difference clearly show that the hypothesis of non-stationarity can be rejected. Thus, like most financial time series, the stock price and exchange rates require differencing to achieve stationarity or they are I(1).

Table 1: Results of Unit Root Test

Period	Variables	ADF[*]	PP[*]	KPSS[#]
		Level		
Pre-crisis	EX	-1.5280	-1.5729	1.4704 [a]
	KLCI	-2.2348	-2.1336	1.9734 [a]
	SP500	0.6544	0.7641	4.2686 [b]
Crisis	EX	-2.3865	-2.2710	1.6900 [a]
	KLCI	-1.8816	-1.9122	1.6858 [a]
	SP500	-1.6191	-1.7194	1.7418 [a]
		First Difference		
Pre-crisis	EX	-14.0545 [a]	-27.6930 [a]	0.0505
	KLCI	-11.9088 [a]	-23.6061 [a]	0.1644
	SP500	-14.9265 [a]	-29.0973 [a]	0.0170
Crisis	EX	-16.0660 [a]	-32.0176 [a]	0.0848
	KLCI	-14.7380 [a]	-31.7106 [a]	0.2237
	SP500	-10.3657 [a]	-20.5154 [a]	0.1509
		Critical Values		
	5%	-2.8657	-2.8656	0.4630
	10%	-2.8657	-2.5689	0.3470

Notes: [a] and [b] indicate rejection of null hypothesis at the 5% and 10% level respectively.

[*] The test statistics were computed with lag not exceeding the floor function $floor(4(T/100)^{2/9})$.

[#] Lag lengths were determined based on $[cT]^k$, where c=5 and k=0.25 are adopted following Bierens (2001).

Having identified that all series exhibit I(1) behavior or the maximum degree of integration in the system is one, we examine the nature of causal linkages between the leading prices by performing the Granger non-causality test. Applying the methodology proposed by Toda and Yamamoto (1995) outlined in section III, we examine the nature of causal linkages between stock price and exchange rates. The bivariate model was estimated and the results for both sub-periods are tabulated in Table 2.

Table 2: Result of Bivariate Granger Non-Causality Test Due to Toda and Yamamoto (1995)

	Hypothesis:	MWALD	Concluding remarks
Panel A: Pre-Crisis	SP – /–> ER	318.199 (14)	Reject null
	ER – /–> SP	25.450 (14)	Reject null
Panel B: Crisis	SP – /–> ER	566.842 (4)	Reject null
	ER – /–> SP	119.369 (4)	Reject null

Notes: The shaded statistics indicate rejection of null hypothesis at the 10 % level of significance.
    (– /–>) indicates does not Granger-cause.
    Lag lengths were determined using Akaike Information Criterion (AIC).

Panels A and B report the results for period 1 and period 2 respectively. The result of bivariate model suggests that there exist a bi-directional causality between exchange rate and stock prices (i.e. the null of Granger non-causality is rejected at the 10% level). However, as explained earlier, bivariate model may be flawed due to the omission of important variable. Therefore, we re-examine the causal relationship between stock price and exchange rate by including US stock price (i.e. S&P 500 index) in Equation 1. The US stock price is selected due to important impact the market has on Malaysian equity market.[5] In the present context, the US stock market representing the world market could be a channel through which the foreign exchange and stock are linked. The results of this estimation for both sub-samples are reported in Table 3.

Table 3: Result of Multivariate Granger Non-Causality Test Due to Toda and Yamamoto (1995)

	Hypothesis:	MWALD (lag)	Concluding remarks
Panel A: Pre-Crisis	SP – /–> ER	29.525 (14)	Reject null
	ER – /–> SP	22.937 (14)	Reject null
Panel B: Crisis	SP – /–> ER	4.160 (4)	Accept null
	ER – /–> SP	12.667 (4)	Reject null

Notes: The shaded statistics indicate rejection of null hypothesis at the 10% level of significance.
    (– /–>) indicates does not Granger-cause.
    Lag lengths were determined using Akaike Information Criterion (AIC).

The multivariate model for period 1 suggests that the null of Granger non-causality from stock prices to exchange rate can be rejected at the 10% level and the null of Granger non-causality from exchange rate to stock prices can be rejected at 10% level. The inclusion of US stock price does not affect the lead-lag structure for period 1. This suggests that there is strong evidence to support bi-directional causality or feedback interaction before the crisis unfolded. However, the result for period 2 indicates that only the null of Granger non-causality from exchange rate to stock price can be rejected at the 10% significant level. This is indicative of the one-way causality running from exchange rate to stock price. Further investigation unveiled that the series are highly negatively correlated.[6]

CONCLUSION

This study contributes to the debate about the relationship between the two leading prices (i.e. stock prices and exchange rates) by examining their causal relation using Malaysian daily data as a case study. This study employs both bivariate and multivariate models covering a sample period ranging from January 1993 to August 1998. Essentially, the unit root properties of each series were determined using the ADF, PP and KPSS tests. Having established the order of integration of the individual series, we move to testing for causal linkages using the Granger non-causality test prescribed by Toda and Yamamoto (1995). Among the finding of interest, bi-directional causality exists in a bivariate model. However, this model is potentially misspecified and may be flawed due to the omission-of-variable phenomenon. Therefore, we re-examine the relationship between the stock prices and exchange rate in a multivariate setting by allowing US stock price to exert their potential influences on local stock prices and exchange rates. The result for period 1 indicates the robustness of the estimation as the inclusion of US stock price does not change the lead-lag structure. The bi-directional causality prevails between the series in period 1. With respect to informational efficient market hypothesis, this finding suggests that both stock and foreign exchange markets are not efficient with regard to each other as information in one market can be used to predict the movement of other market. However, the result for period 2 suggests that there is only one-way causality running from exchange rate to stock price.

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[5] Wei et al. (1995) found that US market has more impact than Japan stock market on Asian equity markets.
[6] Correlation coefficient equals -0.8623.

The existence of one-way causality from exchange rate to stock price (based on multivariate model), during the recent crisis suggests that the exchange rate movements in Malaysia have important implications on the stock market behavior. Although the 'flow-oriented" model suggest that the exchange rate take the lead, the negative correlation between the series however has ruled out this possibility. Basically, the model suggests that the exchange rate lead stock price with positive correlation (i.e. currency appreciation (depreciation) leads lower (higher) stock price). However, this was not the case as recent crisis unveiled a simultaneous occurrence of currency and stock price depreciations. The recent behavior in Malaysian financial market may be accurately explained by herding behavior. A fall in stock price follows the depreciation of Malaysian ringgit as fear of further currency depreciation encouraged people to liquidate their shares holding. This psychology factor is not considered in both portfolio-balance and flow-oriented models.

REFERENCES

Abdalla, I.S. and Murinde, V., 1997, Exchange rate and stock price interactions in emerging financial markets: evidence on India, Korea, Pakistan, and Philippines, Applied Financial Economics 7, 25-35.

Amain B. A. and Law, S.H., 2000, The relationship between stock price and exchange rate: Empirical evidence based on the KLSE market, The Asian Economic Review 42,39-49

Ang, J. S and Ghalab, A., 1976, The impact of us devaluation on the stock prices of multinational corporation, Journal of Business Research 4:25-34.

Bahmani-Oskooee, M. and Sohrabian, A., 1992, Stock prices and the effective exchange rate of the dollar, Applied Economics, 24, 459-64.

Bank Negara Malaysia. Monthly Statistical Bulletin, various issues.

Bierens, H. J., 2001, "EasyReg International 2001", Department of Economics, Pennsylvania State University, University Park, PA

BNM (Bank Negara Malaysia), 1999, The Central Bank and Financial System in Malaysia – A decade of Change, Kuala Lumpur.

DeJong, D.N., Nankervis, J.C., Savin, N.E. and Whiteman, C.H., 1992, Integration versus trend stationarity in time series. Econometrica, 60, 423-433.

Dornbusch, R. and Fisher, S. 1980, Exchange rates and the current account, American economic review, 70, 960-971.

Frank P. and Young, A., 1972, stock price reaction of multinational firms to exchange realignments, Financial Management, 1,66-73.

Granger C.W.J., Bwo-Nung, H., Yang, C.W., 2000, A bivariate causality between stock prices and exchange rates: Evidence from recent Asia flu, The Quarterly Review of Economics and Finance, 40, 337-354.

KLSE (Kuala Lumpur Stock Exchange). Investor Digest, various issues.

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P. and Shin, Y., 1992, Testing the null hypothesis stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root?, Journal of Econometrics, 54,159-178.

Masih, A.M.M. and Masih, R., 1999, Are Asian stock market fluctuations due mainly to intra-regional contagion effects? Evidence based on Asian emerging stock markets, Pacific-Basin Finance Journal, 7,251-282.

Mok, H.M.K. 1993. Causality of interest rate, exchange rate and stock price at stock market open andclose in Hong Kong. Asia Pacific Journal of Management 10, 123-143.

Moreno, R., Pasadilla, G., and Remolona E., 1998, Asia's financial crisis: lessons and policy responses, Pacific Basin Working Paper Series, (Federal Reserve Bank, San Francisco).

Phillips P. C. B. and Perron, P., 1988, Testing for unit root in time series regression, Biometrika, 75, 335-46.

Rambaldi, A.N and Doran, H.E, 1996, Testing for granger non-causality in cointegrated systems made easy (University of New England, Australia).

Said,D.E. and Dickey, D.A., 1984, Testing for unit root in autoregressive moving average models of unknown order. Biometrika, 71, 599-607.

Schwert, G.W., 1987, Effects of model specification on tests for unit roots in macroeconomic data, Journal of Monetary Economics, 20, 73-103.

Shiller, R. 1984, Stock prices and social dynamics, Brookings Papers on Economic Activity, 2, 457-510.

Smith, C., 1992, Stock markets and exchange rates: A multi-country approach, Journal of Macroeconomics, 14, 607-29.

Stock, J.H., 1995, Cointegration, long-run comovements, and long-run horizon forecasting. (University of New South Wales, Australia).

Toda, H. Y. and Phillips, P.C.B., 1995, Vector autoregressions and causality, Econometrica, 61,1367-1393.

Toda, H. Y. and Yamamoto, T., 1995, Statistical inference in vector autoregression with possibly integrated processes, Journal of Econometrics, 66, 225-250.

Wei, K.C.J, Yu-Jane, L, Chau-Chen, Y., Guey-Shiang C. 1995, Volatility and price change spillover effects across the developed and emerging market, Pacific-Basin Finance Journal, 3, 113-36.

Williamson, J. 1985, The exchange rate system, Washington, DC: Institute for International Economics.

Zapata, H.O., and Rambaldi A.N., 1997, Monte Carlo evidence on cointegration and causation. Oxford Bulletin of Economics and Statistics, 59(2), 285-298.

The Effect of Environmental Rules on Trade Practice:
The Case Of Malaysia

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ABSTRACT

The objective of this paper is to explore the present environmental rules, be it Malaysia's own rules or the international environmental agreement, and their effect on Malaysia's trade practice. It will also discuss how a developing country such as Malaysia would comply with these rules and whether to follow them in order to preserve its environment. By complying with them, will Malaysia somehow bend its trade rules and policy and being a member of the World Trade Organizations (WTO), the General Agreements of Tariff and Trade (GATT) and further sacrifices its intention and every rapid activities to improve and increase its economy. The role of the World Trade Organizations (WTO) will also be discussed here. It is hope that this paper would make us aware of the importance of the environment in the world trading system.

INTRODUCTION

In the World Trade Organization's (WTO) case of United States-Import Prohibition of Certain Shrimp and Shrimp products (http://www.wto.org, 2nd July, 2004), India, Pakistan, Thailand and Malaysia filed a complaint to the World Trade Organization (WTO) Dispute Settlement Bodies against the United States in 1997 for imposing an embargo on their exports of shrimps and shrimps product. The United States claimed that these countries have been using harvesting techniques or a form of technology, which harm sea turtles. The United States would only lift the ban if these countries would use a turtle exclusions device (TED). This is a device which the United States government believed will not harm sea turtles, a species which is considered protected under the Convention on International Trade in Endangered Species (CITES) 1973. The United States regulation has certainly blocked these countries exports of shrimps into their market by imposing this environmental measure. Is a country allowed to use their environmental measures to block the market access of another country? The issue that the Dispute Settlement Body had to decide was whether the United States was justified in using environment conservation and that is the protection of sea turtles as a trade measure and bans the imports of shrimps and shrimps product from these countries (Schultz,1999). The objective of this paper is to explore Malaysia's position and reaction to this so call environment and trade conflict and whether it has affected Malaysia's trade practice.

THE SHRIMP-TURTLE CASE

Shultz (1999) stated that the United States had imposed an import ban on all shrimps and shrimps product from countries that used harvesting tactics, which were harmful to sea turtles. Sea turtles were listed as an endangered and threatened species under the Convention on International Trade in Endangered Species (CITES) 1973. Under the United States Endangered Species Act (ESA) 1987 regulation, it was stated that all United States shrimp trawlers were to use a Turtle Excluder Devices (TED).Further under the ESA, Section 609 of the United States Public Law 101-162 Relating to the Protection of Sea Turtles in Shrimp Trawl Fishing Operations was also enacted and it imposed the rules, which strictly requires that all shrimp trawlers to use TED in their shrimp trawling activities. This regulations further rules that United States should not import shrimp or shrimp products which are harvested by a technology that harmed sea turtles.

Shultz (1999) further stated that Malaysia is one of the countries that are affected by this regulation and in 1997 together with India, Pakistan and Thailand, filed a complaint to the Dispute Settlement Body of the World Trade Organizations (WTO). According to Schultz (1999), in April, 1998, the Dispute Settlement Panel of the WTO had decided that Section 609 has violated Article XX of the General Agreement of Tariff and Trade (GATT). It was held

by the Dispute Settlement Panel that the import ban by the United States on the shrimps and shrimps product from India, Pakistan, Thailand and Malaysia constituted an "unjustifiable discrimination" and inconsistent with the WTO practices of multilateral trading system. She further claimed that in July 1998, the United States filed an appeal to the Appellate Body of the WTO, which then analyzed the decision made by the Dispute Settlement Panel. They agree with the Panel's decision that the United States had violated the GATT Article XX but did not agree to the Panel's argument in that case. Schultz (1999) claimed that the Panel made a decision based on the fact that the United States regulation was threatening the multilateral trading system and unlike the Appellate Body, did not examined whether the United States regulation was "unjustifiable" and "discriminatory" and not inconsistence to GATT Article XX (b) and (g).

Schultz (1999) also stated that one of the reasons that the United States failed in this case was because the United States government did not give enough time for these countries especially developing countries to use or to change their technology in their fishing practices into a new form. She also believed that when the US government decides to impose such regulation, they should have entered into a multilateral agreement with every country that may be affected by this regulation. Section 609 is a unilateral rule that is made by the United States to be implemented through their own shrimp trawlers and further to other countries trawlers without them agreeing to it.

However the World Trade Organization (WTO) (http://www.wto.org, 1st July, 2004) stated that the United States did not lift the ban but only corrected the measures that said to be discriminatory by the Appellate Body. They had merely issued a Revised Guidelines for the Implementation of Section 609 of Public Law 101-162 Relating to the Protection of Sea Turtles in Shrimp Trawl Fishing Operations. Malaysia contested this and believed that the United States should obey the Appellate Body decision by lifting the ban completely. The United States admitted that their measure was inconsistent with Article XI:1 but it was justified under Article XX (g). So they believed they could still maintained the ban but remedied whatever that was claimed to be unjustified by the Appellate Body. The Appellate Body agreed with the United States arguments and believed that the United States had made an effort in the implementation of the Appellate Body decision by negotiating with the relevant countries concerning the ban. Malaysia's claim that an international agreement should be concluded in regards to the lifting of the ban had been dismissed by the Appellate Body.

In the above case, it is believed that Malaysia has no choice but to adhere to the decision of the WTO Appellate Body. This is one of the situations where a developing country such as Malaysia should be concern of as it's not only involved the relationship of environment and trade but also affect Malaysia's global market. The developed countries could use environment concerns as a trade measure and thereafter discriminate the developing and undeveloped countries products. What does a developing country such as Malaysia have to do about it? How would it react to the environmental friendly trade measures, policies and regulations and whether these multilateral environmental agreements have an impact on its trade practice?

THE WORLD TRADE ORGANIZATION'S (WTO) ROLE IN CONTAINING THE ENVIRONMENT AND TRADE CONFLICT

The World Trade Organization (WTO) (http://www.wto.org, 1st July, 2004) is playing a major role in ensuring that the environmental policies and measures will not be an obstacle to the international trade. The WTO has established the Committee on Trade and Environment in 1994 to tackle issues which will arises from the environment and trade conflict and that which will affect trade practices. The said Committee could amend any trade agreements that will affect the global environment protection in any way (http://www.wto.org, 1st July, 2004).

The WTO (http://www.wto.org, 1st July, 2004) also encourages its members to enter into multilateral agreements in order to carry out their efforts to protect the environment and to contain issues that arise from the environment and trade measures conflict. Out of 200 international agreements that have been entered into by the WTO members, only 20 of these agreements have an effect on the global trading system. A few of these agreements are the Montreal Protocol 1987, an agreement which is entered into for the protection of ozone layers; the Basel Convention 1989, an agreement which concerns trade or transportation of hazardous waste across international borders and of course, the Convention on International Trade in Endangered Species (CITES) 1973.

The WTO (http://www.wto.org, 1st July, 2004) further believes that by entering into multilateral agreements, it would settled the environment and trade measures conflicts, protect the environment and fair trade could be carried out successfully. By entering into these agreements, every member will agree on a trade measure, plan, trading practices and therefore international conflicts could be prevented. If there are issues that need to be clarify or solved,

these members could apply to the WTO to set up a panel to settle the conflict. In the World Trade Organization's (WTO) case of Malaysia-Prohibition of imports of Polyethylene and Polypropylene (http://www.wto.org, 2nd July, 2004), in 1995 the Government of Singapore expressed their concern on the Government of Malaysia restrictive trade policies in respect of their export of plastic resins to Malaysia. They requested that Malaysia enter into consultations in regards to the prohibition of imports of polyethylene and polypropylene carried out by Malaysia under Malaysia's Customs (Prohibition of Imports)(Amendments)(No. 5) Order 1994. Malaysia objected to this complain and refused to lift the restriction. The discussion carried out between the two countries has failed and Singapore requested to the WTO that a panel should be established to settle the matter.

The WTO also has their Dispute Settlement Body (DSB). The objective of the DSB panel is to settle any dispute that may arises between members and to carry out all obligations under the WTO regardless whether a member would agree to them or not (Bhagirath Lal Das, 1999).

The developing and undeveloped countries are worried that by following these environmental friendly trade measures, it might affect their international trading and their access to the global market (http://www.wto.org, 1st July, 2004). The WTO (http://www.wto.org, 1st July, 2004) does not dismiss the fact that the developing and undeveloped countries need help in carrying out these environmental friendly trade measures. Therefore, the developing and the undeveloped countries are given longer terms by the WTO to implement any trade measures that are required under the WTO and they were also assisted by the WTO in terms of providing new technologies in order for these developing countries to carry out the trade measures.

MALAYSIA'S EFFORT

According to the Ministry of International Trade and Industry (MITI, 2003) since Malaysia is a member of the General Agreement of Tariff and Trade (GATT) from 1957, it automatically became a member of WTO when the WTO was form through the Marrakesh Agreement in 1995. It is important for Malaysia to be a member of the WTO(http://www.miti.gov.my, 6th August, 2004). The Ministry of International Trade and Industry (http://www.miti.gov.my, 6th August, 2004) states that Malaysian economy dependant on exports of goods and materials. Therefore, it needs the WTO because it is the only international body that deals with international trade and the multilateral trade agreements which is entered by many countries. Through these agreements, the WTO could govern the international trade and protect the rights of its members if dispute arises, the Dispute Settlement Bodies of the WTO could settle them (http://www.wto.org, 1st July, 2004). The WTO not only provides a fair trade and sound condition in the world trading system, but it will also provides a wider and easier market access to Malaysia and the other developing countries (http://www.miti.gov.my, 6th August, 2004). As WTO main principles are providing fair trade and to prevent unjustified discrimination, this is a good opportunity for the developing countries to boost their international trade and obtained rapid development (http://www.wto.org, 1st July, 2004).

Sham Sani (1993) stated that Malaysia has participated and is a signatory to many conventions, which includes the Convention on International Trade in Endangered Species (CITES) in 1973, United Nations Convention on the Law of the Sea in 1982, International Tropical Timber Agreement in 1983, Vienna Convention for the Protection of the Ozone Layer in 1985 and the Montreal Protocol in 1987. However he claims that Malaysia's concern in the environmental- trade issues did not only begin from the Shrimp-Turtle's case but it goes way back to the agreement made in the 1987 Montreal Protocol. Sham Sani (1993) also claimed that the developing and undeveloped countries did not take an active part in drawing up the terms and conditions of this protocol and it jeopardized their rights in the trading system. In the protocol it was agreed that the developing nation were to consume only 0.3 capita of chlorofluorocarbons (CFCs) where else they are the countries that needed the CFCs most for their development. With only 0.3 capita of CFCs to be used, not much could be done by the developing countries for their development and further caused a major impact on their trading. The protocol did not benefit these countries much and more in favor of the developed countries.

Due to this the developing countries especially Malaysia started to take an active part in every steps of the global move in conserving the environment (Sham Sani, 1993). After the Montreal Protocol in 1987, it continues to participate in the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal in 1989, the Framework Convention on Climate Change and Convention on Biological Diversity in 1992 (Sham Sani, 1993). It even hosted the Second Ministerial Conference of Developing Countries on Environment and Development in Kuala Lumpur in 1992 so that the developing countries would be able to discuss their stand before they attended the United Nations Conference on Environmental and Development (UNCED) held on the same year (Sham Sani,1993).

According to (Ben Boer et al., 1998), at the regional level, Malaysia together with the other ASEAN countries has also organized conventions and conferences to tackle this environment issues. Malaysia hosted the Ministerial Meeting on the Environment (AMME) in Subang in 1990 and had declared the Kuala Lumpur Accord on Environment and Development. This Ministerial Meetings were organized and attended by all the ASEAN countries. These meetings focused on all the problems and issues arise in the ASEAN countries.

As we can see, Malaysia has entered in to multilateral environmental agreements and held conventions in order to be involved in the maintenance of the global environment. This is to enable it to uphold its policies, to maintain its views in world issues and to protect its rights especially in those that are trade related.

For environmental issue at home, the laws and regulations on the management of environment have been enacted as early as the 1920's beginning with the Waters Enactments 1920 (Sham Sani, 1993). Although Malaysia has a lot of environmental related legislations, it does not have any particular legislation that covers every part of the environmental problems not until the Environment Quality Act 1974 (Act 127) (EQA) was enacted (Sham Sani 1993). It is believed that the government policy on environmental protection could be carried out well through the EQA (Sham Sani, 1993).

The Malaysian Industrial Development Authority (MIDA) (http://www.mida.gov.my, 30th July, 2004) states that through the EQA, the government requires that a project that is going to be carried out in Malaysia should be tested with the environmental impact assessment. Malaysia also introduced the National Environmental Policy where it aims "at the continued economic, social, cultural progress of Malaysian and enhancement of the quality of life of its people through environmentally sound and sustainable development." (http://www.mida.gov.my, 30th July, 2004). The government also discussed environmental issues in their development plan for the country (Sham Sani, 1993).

CONCLUSION

It is to be concluded that Malaysia can avoid these conflicts and managed to contain any problems that may arises in future. Firstly, through the multilateral agreements entered between the member countries of the WTO. Through the said agreements, better understanding of the trade practices between countries could be achieved. Then fair trade would be practiced without any discrimination and injustice and further, wider market access could be provided. Secondly, Malaysia should continue to host conventions and conferences with other member countries at the international and also at the regional level. Thirdly, considering the impact of the 1987 Montreal Protocol has on the developing and undeveloped countries, Malaysia should be
concerned and take an active role in the drawing up of the terms and condition of any agreement that is going to be entered in future. Fourthly, Malaysia should take the opportunity and make use of all the special treatments that the WTO provided to the developing and undeveloped countries. We could only hope that the WTO would continue and serious in its effort to help the developing countries in the global trading.

The question whether the environmental issues would affect Malaysia's trade practice will depend on how Malaysia handled the problems at hand. Being the member of the World Trade Organization has it advantages. Malaysia's trade practice may not be affected if the countries that Malaysia trade with especially the member countries of the WTO, would in the first place have agreed on the trade practices and the measures that is carried out by Malaysia.

REFERENCES

Jenny Schultz.1999. *Balancing the Relationship between Trade and the Environment within the World Trade Organization : Is this the end of the Sea Turtle?.* Asia Pacific Journal of Environmental Law. Volume 4: Issue 1. Kluwer Law International. 37-60
Ben Boer, Ross Ramsay & Donald R. Rothwell. 1998. *International Environmental Law in the Asia Pacific.* London. Kluwer Law International
Sham Sani. 1993. *Environment in Malaysia : Changing Concerns and Approaches.* Kuala Lumpur. Institute of Strategic and International Studies
MITI. 2003. *Malaysia and the WTO.* Kuala Lumpur. Ministry of International Trade and Industry Malaysia
Bhagirath Lal Das. 1999. *The World Trade Organisation : A guide to the Framework for International Trade.* London, New York, Penang. Zed Books and Third World Network

Environment backgrounder : Brief History of the Trade and Environment Debate . Trade and Environment of the WTO. http://www.wto.org/english/tratop_e/envir_e/envir_backgrnd_e/cls2_e.htm Accessed 1st July, 2004

Environment backgrounder : Brief History of the Trade and Environment Debate. Parameters of the Discussion in the WTO. http://www.wto.org/english/tratop_e/envir_e/envir_backgrnd_e/cls3_e.htm Accessed 1st July, 2004

Environment backgrounder: Environment-Related Disputes : An Overview. WTO cases. http://www.wto.org/english/tratop_e/envir_e/envir_backgrnd_e/c8s2_e.htm. Accessed 1st July, 2004

Understanding the WTO : Cross Cutting and New Issues. http://www.wto.org/english/the wto_e/whatis_e/tif_e/bey2_e.htm . Accessed 1st July, 2004

United States- Import prohibition of certain Shrimp and Shrimp products http://docsonline.wto.org/GEN_viewerwindow.asp?D:/DDFDOCUMENTS/T/WT/DS/58R Accessed 2nd July, 2004

Malaysia – prohibition of imports of Polyethylene and Poly propylene http://docsonline.wto.org/GEN_viewerwindow.asp?D:/DDFDOCUMENTS/T/WT/DS/1-1 Accessed 2nd July, 2004

Environmental Management. http://www.mida.gov.my/beta/view.php?cat=3&scat=32&pg=162 Accessed 30th July, 2004

What is the World Trade Organization. http://www.miti.gov.my/trd-multilateral.html. Accessed 6th August, 2004

Social Demographic Conditions in West Kalimantan:
Segmenting the Market

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ASTRACT

Globalization creates borderless market. Businesspersons have to know any market opportunity before making any decision. One way to obtain information on market opportunity is by segmenting the market. This study has five objectives as follows: 1) to describe social and demographic conditions of West Kalimantan 2) to analyze market opportunity in West Kalimantan 3) to describe imported products in West Kalimantan 4) to describe which countries having market in West Kalimantan and 5) to describe investment opportunities in West Kalimantan. This study mainly utilizes data published by Central Bureau of Statistics and Trade and Industrial Agency. The study concludes that West Kalimantan provides market opportunity for businesspersons and investment opportunity for investors in Borneo. Products especially food, household appliances, fashionable products, education and health have a good market in West Kalimantan. People in West Kalimantan have been looking for a good quality of services such as health and education in other countries in Borneo, such as in Sarawak of Malaysia, other than Jakarta. There are still limited countries, which set West Kalimantan as their target market. In line with this situation, businesspersons are most welcome either to involve in through international trade and/or foreign direct investment in certain recommended fields.

INTRODUCTION

Business managers do not have any control on external environment but they have to consider this environment for their business survival. In the era of a competitive market, social and demographic conditions are part of the external factors influencing decisions of business managers. One way to obtain information on consumers is by segmenting potential consumers based on their social and demographic characteristics.

> "Market segmentation is an attempt to subdivide the overall market into smaller groups of potential consumers who share some common need and characteristics. The four most common who share common bases for segmenting the consumer market are demographic, geographic, behaviouristic, and psychographics " (Rachman et al, 1990:309).

Market segmentation is an important factor in the era of competitive marketing. This study will segment the consumers in West Kalimantan based on some social and demographic characteristics. Social characteristics include geography, economy, and education and labor force participation as approach to behavior and psychograph characteristics. Demographic characteristics consist of age and sex.

Geographic position of West Kalimantan province in the context of Borneo intensifies penetration of globalization in this province. Like it or not, even before formal implementation of the free trade era in the ASEAN countries in 2003, both legal and illegal free trade has been part of the West Kalimantan economy due to West Kalimantan geographic position.

Condition in West Kalimantan confirms argument of Ohmae (1995) in his book entitled "The End of the Nation State".

> The evidence, then, is as exhaustive as it is uncomfortable is a borderless economy, the nation-focused maps we typically use to make sense of economic activity are woefully misleading. We must, managers and policymakers alike, face up at last to the awkward and uncomfortable truth; the old cartography no longer works (Ohmae, 1995: 19-20).

Globalization accompanied by free market has reduced barriers for foreign products to entry a particular country. Competition between products is getting tight that encourage business managers to apply the right strategy to survive by applying competitive marketing. The stages of competitive marketing are: 1) find out consumer's needs and preferences and analyze the competition, 2) produce products that appeal to consumers and offer a competitive advantage, 3) plan advertising and sales methods to appeal to consumer, (3) advertise, (4) develop sales force (5) take orders and (6) ship goods (Rachman, et al 1990: 297).

This study has five objectives as follows: 1) to describe social and demographic conditions in West Kalimantan, 2) to analyze market opportunity in West Kalimantan, 3) to describe imported products in West Kalimantan market, 4) to describe which countries having market in West Kalimantan and 5) to describe investment

opportunities in West Kalimantan. This study mainly utilizes data published by Central Bureau of Statistics, and Trade and Industrial Agency.

SOCIAL AND DEMOGRAPHIC CONDITIONS OF WEST KALIMANTAN

Geography

Geographic position of West Kalimantan province in the Indonesian context is unique. The only legal land border crossing between Indonesia and overseas is located in Entikong district of West Kalimantan. West Kalimantan province especially border districts are more closed to Sarawak of East Malaysia than to Pontianak and the other parts of Indonesia.

West Kalimantan and Sarawak are linked with land transport and the transport facilities have been relatively sufficient and good. A number of public buses travel from Pontianak (capital city of West Kalimantan province) to Kuching (capital city of Sarawak) or vice versa both in the morning and at night. From Kuching, the travelers may continue their travel to Miri and then Bandar Seri Begawan, Brunei Darussalam. Consequently, penetration of globalization in some cases in West Kalimantan is more rapid and intensive than in the other parts of Indonesia. In the near future, there will be land road that links West Kalimantan and the other provinces in Kalimantan (South, East and Central Kalimantan).

Economy

West Kalimantan economy has not been well developed. Past economic growth – before 1997 – ever reached 7 per cent and over, but the economic growth was only less than 3 per cent by 1997 onwards. The high economic growth in the past, however, has not brought any significant impact on provincial economic development. Human Development Index (HDI) in this province is the fourth lowest in Indonesia.

The number of unemployed persons in 2000 was about 90 thousands. This figure could be much higher since there are discouraged persons who are not actively looking for a job but they actually need a job. Moreover in the recent years, many wood processing companies that absorbed a large number of labors, have to stop their production due to run out of woods. Thousands of labors laid off cannot be avoided. Condition is getting worse since industrial sector other than processed woods are slowly developed.

General economic condition has not been good. This is indicated by per capita income in the year 2000 (Rp. 1,975 thousand) that was the lowest in Kalimantan. However, a small proportion of the population in West Kalimantan has income that is much higher than per capita income that enables them to consume the expensive products such as branded products, sending children to study overseas or having general health check up overseas.

West Kalimantan produces raw materials such as palm oil and crumb rubber and processed wood that are mainly for export, except palm oil that has to be processed further in Sumatera. Of the total export in 2000, the share of processed wood and crumb rubber was 52 per cent and 30 per cent respectively. West Kalimantan also produces a number of crops with a limited amount of production such as rice and some kinds of vegetables. Most of these crops will be sold to the market that will provide greater revenue to the traders that can be in Sarawak or West Kalimantan. West Kalimantan is highly dependent on imported products for daily needs, both from other parts of Indonesia especially Java, and overseas.

Demography

The number of population in West Kalimantan has been increasing due to natural growth (number of births is greater than number of deaths) and net migration (in-migration is greater than out-migration). More than half of the population resides in rural areas. By the year 2000, the number of population was 3.7 million or 0.5 million larger than the number of population in 1990. Age structure of population in West Kalimantan is dominated by those who are in the productive age group (15-64 years) that was around 64 per cent of the total population.

Education and Labor Force

Higher aspiration towards education encourages daughters and sons to stay longer at schools. Many daughters and sons from rural areas migrate to urban areas for having a further study. Consequently, they have to stay in a separate house with their parents though they have not been married. After completing the education, migrants from rural areas are most likely to continue staying in urban areas since job opportunity in urban areas is greater than in rural areas. Not surprisingly, people in urban areas have a higher level of education than people in rural

areas. For instance, population-having education higher than Senior High School in urban areas was more than two fold (38 thousand) than those who was in rural areas (16 thousand).

Of the total population, almost half are women. Increasing level of education among women (6 per cent in 1990 and 10 per cent in 2000 for women having Senior High School education or higher) has increased their participation in the labor force (28 per cent in 1990 and 59 per cent in 2000) especially in the formal sector (12 per cent in 1990 and 17 per cent in 2000). A higher wage in Sarawak compared to West Kalimantan encourages women to work in Sarawak as a housemaid or a labor in wood processing companies or palm oil estates.

The formal sector is identified as the sector whereas housework and office work are not compatible. Nowadays, finding women who want to be employed, as a full time housemaid in urban Kalimantan, is not easy. This condition creates difficulties for women who work in the formal sector.

MARKET OPPORTUNITY IN WEST KALIMANTAN

Social and demographic conditions in West Kalimantan previously discussed have indicated market segmentation. This is important information for businesspersons who are interested to extend their market in West Kalimantan. The following section will discuss implications of market segmentation on some commodities, which have market opportunity in West Kalimantan.

Food

Rice is a staple food for people in West Kalimantan. Rice consumption is dynamic following income pattern of the population. Increasing income increases desire to consume a better quality of rice, which is more likely to be identical with imported rice both from Java and Thailand. People having high-income prefer to consume good quality of imported rice. Both in traditional markets and supermarkets, imported rice is easier to be found than the local rice, except in Sambas and Singkawang districts, locations of central production of the local rice.

West Kalimantan produces rice (local rice). There are three perceptions towards the local rice. First, some people said that the local rice is regarded as having a good quality because it is fresh and natural or least likely to use chemical fertilizer. The local rice traders said that some people in Sarawak prefer to consume the local rice from West Kalimantan that encourages the traders to export the local rice to Malaysia illegally. This factor is believed as one of the factors that reduce availability of the local rice in the local market.

Second, price of the local rice is more expensive than some brands of the imported rice. The imported rice has wide ranges of quality, from the lowest to the highest. The price of the lowest quality of the imported rice is cheaper than the local rice. Third, the local rice has not been popular among people who have high- income in West Kalimantan.

Increasing income in West Kalimantan especially in Pontianak, creates two variances of the restaurants. The first variance is fast foods restaurants such as KFC and Pizza Hut mainly established along with establishment of shopping centers. The second variance is modern restaurants for traditional Malay foods. These types of restaurants are relatively expensive for people in general. Increasing women who work in the formal sector increases demand for ready-made food with relatively cheap price that induces business activity of ready-made food vendors and caterers.

Household Appliances

The increase in female labor force participation especially in formal sector, accompanied by difficulties in employing housemaids, encourages the working women to utilize household appliances to reduce their burden in doing housework. Availability of household appliances at home also helps to reduce the burden of housemaids that may prolong their engagement in a particular house. Household appliances such as washing machines, gas stove, refrigerator, blender, vacuum cleaner and the likes have a good market in West Kalimantan. Companies of household appliances actively promote their products such as by having house visit to introduce their products to potential consumers.

Fashionable Products

Half of the population in West Kalimantan is women who are more interested in fashionable products such as cloths and shoes compared to men. Pontianak has many small shops selling fashionable products with relatively cheap price. Along with establishment of shopping centers in Pontianak, some retailed shops sell branded products that are expensive according to people in general. Fashionable products such as cloths have to compete with imported used cloths from Malaysia. Some shops in Pontianak, Singkawang and Sambas districts especially sell imported used cloths from Malaysia.

Education and Health

The high-income families nowadays are more likely to obtain international quality of services especially in education and health. Other than Jakarta, the high-income families in West Kalimantan have an alternative to send their children to international quality schools in Sarawak especially at the level of university. Every year, colleges in Sarawak actively promote in Pontianak and these colleges have had agents in Pontianak. Businesspersons in Pontianak have anticipated this trend by establishing pre and primary schools applying foreign language, usually English and or Mandarine, to their students in daily activity. The high-income families also tend to have medical treatment in Malaysia. One agent of private hospital from Sarawak has been established in Pontianak that helps the potential consumers to obtain services in Sarawak.

Imported Products in West KalimantanMarket

As previously mentioned, West Kalimantan is highly dependent on imported products for daily needs. What kind of imported products found in West Kalimantan will be described as follows.

Using broad economy category, imported goods in West Kalimantan consist of consumption goods, capital goods and raw material/auxiliary goods. In year 2002, from the three categories, value of imported consumption goods placed second position (37 per cent) below the value of imported capital goods (42 per cent). While in the first semester of 2003 value of imported consumption goods placed third position (16 per cent) compensated by the increase in the percentage of imported capital goods share (59 per cent) and raw material/auxiliary goods share (25 per cent).

Consumption goods imported by West Kalimantan mostly are food products such as rice, dried food (fruit/vegetable/chilly/anchovies), salted food (fish, egg), frozen fish, fresh fruit/vegetable (potato/carrot/cabbage/bean/ groundnut kernel, pears), garlic, etc followed by kids toy, electric tools/parts, and other households necessities. In national level, consumer expends 38.8 per cent of their income on food/drink and tobacco. Imported capital goods consist of product related to agricultural and industrial sector in West Kalimantan, such as fertilizer, plywood steam oven, etc. While imported raw material/auxiliary goods mostly consist of chemical product and wood product to support paper industry.

Imported goods in West Kalimantan come not only through Pontianak and Ketapang seaport but also through another entry point, which is cross-border gate of Entikong, especially for imported products from Malaysia. Malaysia, particularly East Malaysia uses West Kalimantan to market its products that is able to compete with products originally from West Kalimantan and products from the other regions in Indonesia and overseas. Main commodity imported from Malaysian side is fresh fruits, soft drinks, milk, dry bread, poultry feed, eggs, wheat, and other food products and cosmetics.

West Kalimantan also fulfills its necessities by goods from other region in Indonesia via inter-island trade. This situation allows imported goods to enter West Kalimantan via other provinces/ports. There are four categories of goods in inter-island trade, which are: basic necessities, strategic goods, oil/non oil, and others. In 2002, 50 thousand tons of rice and 16 thousand tons of sugar enter Pontianak and Ketapang seaport. Around 50 thousand tons of imported asphalt also enters Pontianak in 2002 along with other commodity such as 16 thousand tons of concrete iron and 828 thousand tons of fuel.

WHICH COUNTRIES HAVE SET WEST KALIMANTAN AS A TARGET MARKET?

It is obvious that Malaysia, as the closest country, has the best chance to set Indonesia, especially West Kalimantan, as their target market. Imported product in West Kalimantan comes from 31 countries in Asia, America, Europe, Africa, Australia and Oceania. Asia still plays most important role since 73 per cent of the year 2002 total import (non-oil) in West Kalimantan comes from Asian countries, especially ASEAN countries. Import realization of non-oil and gas by 5 biggest seller countries are as follows:

Table 1: The value of Non-Oil and Gas Import by Country of Origin 2002
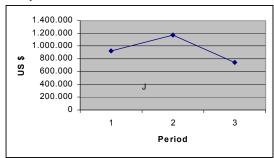
No	Country	Value (US $)	per cent Share to Total Non Oil & Gas Import
1	Malaysia	11,398,577.85	28,79
2	Thailand	9,880,790.20	24,95
3	China	3,718,840.70	9,39
4	United States	2,912,391.63	7,35
5	Singapore	2,709,601.22	6,84

Sources: West Kalimantan Trade and Industrial Agency, 2003

Largest part of West Kalimantan imported commodity come from Malaysia. The value of imported goods from Malaysia in 2003 (MoM) tends to fluctuate due to internal and external factor that influenced import. Imported food products from Malaysia are highly demanded during each religion holiday (Idul Fitri, Christmas, Imlek, etc) while demand for fertilizer is inline with planting seasons.

Table 2: Indonesia Non Oil Import From Malaysia January – March 2003

Period	US $	per cent Change
January	920.561,65	-
February	1,177,984.91	27
March	742,662.04	-36

Sources: West Kalimantan Trade and Industrial Agency, 2004

Even though there is high intensity of trade between West Kalimantan and Malaysia, in national level, imported goods from Malaysia only constitute 3,06 per cent of Indonesia total non-oil and gas import. On the other Indonesia has not been a target market for Malaysia. Indonesia is not one of major export partner for Malaysia as shown in Table 3.
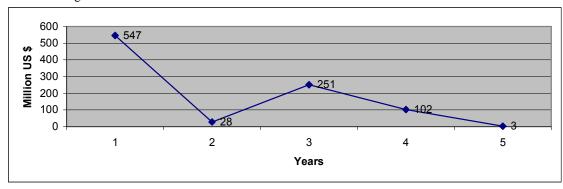
Table 3: Malaysian Export Base on Major Commodity and Trade Partner

Export commodity	Food product, fertilizer, electronic equipment, petroleum and liquefied natural gas, chemicals, palm oil, wood and wood products, rubber, textiles
Export partner	United States (21 per cent), Singapore (18 per cent), Japan (13 per cent), Hongkong (5 per cent), Netherlands (5 per cent), Taiwan (4 per cent), Thailand (3 per cent).

Source: CBS, 2004

SEEKING INVESTMENT OPPORTUNITIES: FOREIGN DIRECT INVESTMENT (FDI) IN WEST KALIMANTAN

One of the problems faced by West Kalimantan in promoting its development is lack of investment. Contribution of Foreign Direct Investment (FDI) in West Kalimantan is mostly in forestry, plantation and mining sector. The nature of such project attracts large investment in early stage, followed by a longer period of modest investment. As much as 44 per cent of FDI in West Kalimantan is in mining sector followed by plantation (20 per cent) and forestry (14 per cent). Trend of FDI approval in West Kalimantan has shown decreasing of FDI.

Trend of Foreign Investment in West Kalimantan 1996-2000

The results of interview with local businesspersons in West Kalimantan show their aspiration towards investment development policy and management in order to attract investors to West Kalimantan as follows:

Development policy	Development management
▪ Establishing an enabling environment for private sector activity with particular attention to region's attractiveness to the foreign and domestic investor.	▪ Providing basic infrastructure or coordinating and regulating the private provision of infrastructure ▪ Simplify bureaucracy by creating one stop service (samsat) ▪ Tax reform to compensate research conducted by companies ▪ Assure secure business environment using community development program
▪ Acting as facilitator in promoting foreign and domestic investment	▪ Involving private sector in planning for the region development at an early stage ▪ To provide accurate and up-to-date information for investment and business development ▪ Establishment of good coordination and communication among local governments (provincial – districts governments and among neighboring district governments) ▪ Establishment of good communication between government and business sectors

Existing Business Condition and Prospectiveness

Based on Memorandum of Understanding between governor and all mayors/head of districts in West Kalimantan, there are five sectors to be promoted:

1. Food crop agriculture
2. Agribusiness (Oil Palm/Rubber Plantation and downstream industries)
3. Marine and fishery
4. Livestock
5. Tourism

Investment opportunity in food crop cultivation (aloe vera, corn, orange, other local/tropical fruits) is supported by wide unutilized area, suitable land condition and socio-cultural aspect of local communities. Agribusiness sector is still focusing in development of new estate plantation with partnership management between farmers and estate companies. Most interviewed local businesspersons agree that agribusiness sector has the best prospective among all in the future with following new trend: rehabilitation/ replacement of old/unproductive plantation with high yielding one; development of downstream industries (rubber based, palm oil based, etc); organic farming in almost all inland area.

Existing business in fresh water fishery is still limited. Businesspersons prefer to open their fishery business in coastal area (Sambas and Ketapang districts) where larger market is easier to access. They agree that in the future, fishery in common is prospective especially for export market.
Livestock is also promising since excess demand for beef still persists in domestic market, especially in holiday seasons. On the other hand, wide unutilized land is still available for beef fattening business in Sambas, Bengkayang, Singkawang, Landak and Ketapang districts.

So far tourists visit West Kalimantan as a place for transit before visiting Malaysia or Singapore in order to avoid fiscal payment or for business meeting/gathering. According to businesspersons, city tour package is quiet not prospective compare to eco-tourism, while hotel and restaurant business are prospective for transit tourist and businesspersons. Beside, there are still no five star hotels in West Kalimantan as a representative place for business gathering.

Negative List of Investment

Based on Presidential Decree 96/2000 jo.118/2000, several business fields are included in negative list with following categories:
1. List of business fields absolutely closed for investment
2. List of business fields closed to investment in which a part of the share is owned by foreign citizen and/or foreign business entities.
3. List of business fields open to investment under condition of a joint venture between foreign and domestic capital.
4. List of business fields open to investment under certain conditions

Investment Policies

Policies on investment in national level are found on idea that investment should contribute to strengthening and deepening the country's industrial structure. Therefore, the government gives priority to industries that produce capital goods, intermediate product and raw material needed to construct a strong foundation for the acceleration of industrial growth. Priority is accorded to investments that base on natural resources as well as human resources, so that those industries will have strong roots and excel in competition because of their inherent comparative advantage.

Investment producing goods for export will particularly be encouraged. In fact the government provides additional facilities for such export-oriented industries including concessionary export credits, bounded areas, and the development of concept of export processing zones. Investment effecting the region outside Java, especially the eastern part of the country, which open up new centers of economic growth, develop the potentially available natural resources and relate to transmigration schemes are given special priority. Investment should also contribute to the enhancement of the quality of life protection of environment.

CONCLUSION

West Kalimantan provides market opportunity for businesspersons and investment opportunity for investors in countries of Borneo outside Indonesia. Market opportunity in West Kalimantan can be segmented based on social and demographic conditions in this region. Market opportunity in West Kalimantan in the future is promising since West Kalimantan can be an entry point for businessperson to extend the market to the other provinces in Kalimantan or outside Kalimantan. On the other hand, West Kalimantan can also be an entry point for people from other parts of Indonesia to go to the other countries in Borneo for various needs.

Products such as food, household appliances, fashionable products, education and health have prospective market in West Kalimantan. This is mainly due to West Kalimantan which is highly dependent on imported products for daily necessities. Relatively large proportion of women will be promising for fashionable products. Increasing women who work in formal sector increases demand for household appliances that will reduce burden of women to do household chores. The high income increases demand for high quality of services in education and health. Location of developed countries in Borneo provides an alternative for people in West Kalimantan to obtain the high quality of services in education and health in neighboring countries of Borneo.

West Kalimantan as market, has been targeted by ASEAN countries to market their products. So far biggest seller country to West Kalimantan is Malaysia. Although in national level imported goods from Malaysia only constitute 3,6% of Indonesia total imports, leaving the market wide open for other countries. Businesspersons can use this opportunities either through international trade and foreign direct investment. Government of Indonesia encourages foreign investors in certain field such as exported goods industries and utilization of abundant natural and human resource utilization in West Kalimantan.

REFERENCES

BPEK (2004). "Investment Opportunity in West Kalimantan", BPEK: West Kalimantan.
BPEK (2004), "Investment Policy in West Kalimantan". BPEK: West Kalimantan.

Bank Indonesia (2004), "Regional Economic – Financial Statistic", BI, Pontianak.

CBS (2001), "West Kalimantan In Figure", CBS, Jakarta.

CBC (2001), "Statistic of Indonesia" , CBS, Jakarta Harris, Dagupta, Scherer (1997) "Regional Development in Indonesia". World Bank.

http://www.bkpm.go.id/bkpm, "Trend of Foreign Investment Approval by Location 1996-2000.

http://www.bkpm.go.id/bkpm, "Indonesia Investment Online, Negative List of Investment".

http://www.bps.go.id/cgi-bin/releases, "Overview of Indonesia Export & Import".

http://www.bexi.co.id/kajian/eksmigas, "Trend of Non-Oil Export and Import in Indonesia".

Industrial and Trade Agency (2004). Annual Speech of West Kalimantan Governor". West Kalimantan.

Kenichi Ohmae (1995)," The End of the Nation State: The Rise of Regional Economics," the Free Press, A Division of Simon & Schuster Inc. New York.

Planning Board Agency (2004), "Study on In-dept Concept Formation of Masterplan for Inland Development in West Kalimantan, Bappeda, West Kalimantan.

Rachman, Mescon, Bovee and Thill (1990). "Business Today". Mc Graw Hill, New York.

Spencer and Quane (1999), "Agribusiness Opportunities in Kalimantan and Sulawesi", RIRDC.

Barriers to Implementation of Environmental Management System in Malaysian Manufacturing Industries

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ABSTRACT

Environment Management System (EMS) is a system related to the protection of environment against industrial waste. Increasing global pollution has led to greater environmental consciousness towards protecting the earth. Hence, the application of EMS has become a major consideration among industries all over the world. Studies have shown that the implementation of EMS by firms improved their competitiveness (Everett et al.,1993; Elkington, 1994; Bonifant et al., 1995; Porter and Van der Linde, 1996; Hart, 1997 and Howes et al., 1997). However, implementing EMS in Malaysia is a difficult challenge as the actual links between the environment and development planning are not very strong (UNESCAP report, 2003). Therefore, it is important to understand the barriers to the successful implementation of EMS in Malaysian industries. A mail survey was conducted on 214 manufacturing industry in Johor Bahru and 92(43%) were duly completed and returned for future analysis. Results from analysis showed that the lack of knowledge and experience stand out as the most dominant barrier to the implementation of EMS in the manufacturing industry. This lack of knowledge and experience resulted in firm's implementing EMS in an indiscriminate manner which was also the next most dominant barrier to EMS's implementation. Recommendations to facilitate EMS's implementation were given to at the end of the study.

INTRODUCTION

Last quarter of the century had accounted for a number of large-scale industrial disasters. Events such as the gas leakage at a chemical plant in Bhopal, India; the nuclear catastrophe in Chernobyl, USSR; the oil spilled by Exxon Valdez off the coast of Alaska; the fire at a warehouse of a chemical manufacturer at Switzerland; the Love Canal toxic waste site that led to the complete disruption of its community and environment and many others have been embedded in the public mind (Fischer & Black 1995; WCED 1987; Shrivastava 1997; Ritchie & Hayes 1998; Johnson 1997). These environmental disasters had raised global concerns about industry's impacts on the environment and had generated global interest in preventing pollution. The consequences of insufficient management of the organizational activities on environment had resulted in severe pollution and other related problems. Hence, new ways to tackle the environmental and societal issues and the need to minimize and repair the environmental damage have become issues of paramount worldwide importance (Ritchie & Hayes 1998; Johnson 1997). The development of Environmental Management System, EMS is increasingly seen as one of the ways to integrate these issues.

EMS is a well-documented and structured approach to coping with regulations and customer requirements related to environmental issues. It examines issues such as the allocation of resources, alignment of responsibilities, and systematic evaluation of practices, procedures and processes (Wu & Tan 1996).

There are several EMS standards currently adopted by different regions and countries (Subhash 1996). However, among the standards, ISO 14001, which was published in final form in September 1996, is considered the most important and beneficial for organizations intending to implement EMS (Woodside & Aurrichio 2000). ISO 14001 helped companies to monitor the actual performance towards environmental goals (Zhi et al. 2000). Its also benefited organization in terms of direct cost savings on energy consumption and raw material input, in waste management and improving organization's public image which tends to attract foreign investors' interest and credibility (Speerli & Zust 1995; Sweatman, Simon & Blomberg 1997; Lin 1995; Sayre 1996; Chin, Chiu & Pun. 1998; Aboulnaga 1998; Clement 1996; Chattopadhyay 2001).

However, these benefits do not translate to higher number of firms adopting EMS. Only 145 manufacturing organizations in Malaysia implemented ISO 14001 for the year 2001 (SIRIM QAS Directory of Certified

Product and Company 2001), and another 28 manufacturing organizations obtained ISO 14001 certification successfully in 2002 (SIRIM 2002).

PROBLEM STATEMENT

Pollution problem in Johor is among the most severe in Malaysia. According to the Department of Environment (1998), Johor had the most number of stationary sources, followed by Selangor and Sarawak. The same report also indicated that Selangor and Johor together made up of more than half of the total number of water pollution sources from the 5,498 agro-based and manufacturing industries identified in 1998. Report from the SIRIM QAS Directory of certified Products and Company 2001 shows that only 18 out of 486 manufacturing companies in Johor Bahru are ISO 14001 certified. While we understand that ISO 14001 is a voluntary effort, it is rather suprising that only a handful of the manufacturing industries in Johor Bahru see the importance of this certification especially since they stand to gain so much. Hence, it is important for us to ask what barriers they face in the adoption of an EMS.

OBJECTIVE OF THE STUDY

The purpose of this study is to determine the barriers to the successful implementation of environmental management system in Johor Bahru industrial zone. The manufacturing industries in Johor Bahru were chosen in this study because they are believed to be the main actors in the control of environmental degradation here.

LITERATURE REVIEW

As a management-based system, the success of implementing the EMS relies upon the commitment of all employees, especially senior management (Hughes 1996). Without management commitment to EMS, the implementation of EMS in a company will fail (Kuhre 1995a). Gayler (1997) argues that if the implementation doesn't have the full support and commitment of all members from the organization, especially the top management, no matter how careful an EMS has been designed, it is unlikely to achieve its goals. Unfortunately, environmental department is usually considered and treated as redundant, and it is poorly understood, meagrely funded, undermanned with little or without recognition, support or direction from the top management (Kuhre 1995a).

Manager in an organization are the ones who integrate and coordinate the work of others (Robbins & Coulter 1999). Thus, the understanding and perception of EMS among the members of managerial level are important ingredient for the successful implementation of organization's EMS. According to Hilary (1999), understanding and perception become the barriers to successful implementation of EMS when the management is less aware of EMS benefits, lacking in the understanding of environmental statement and its systems, perception of bureaucracy, perception of the high cost for implementation and maintenance of EMS.

Simply affirming a commitment to top environmental performance is not sufficient without active participation in environmental management training (Johnson 1997). This is because the implementation of EMS will lead to changes in an organization (Chapman 1994; Lin 1995). Education and training are needed to enable the employees to meet the knowledge or skill requirement of the new system and should be started early to ensure better awareness (*Environmental Management System* 2001).

In order to ensure the various parts of the system consistency and effectiveness, organizations are required to give consideration to fully documenting EMS (Woodside, Aurrichio & Yturri 1998). EMS processes and procedures are documented and kept up-to-date. Hence, paper work needs to be processed and the productivity of employees will be affected. The increased paper work and perceived reduction in efficiency have frustrated many companies in their efforts to implement ISO 14001 (Jackson 1996).

The cost of implementing EMS is high (Cascio, Woodside & Mitchell. 1996; Abdul Aziz Long 1998). Organization has to pay the yearly recurrent costs for certification renewal, auditing team and technical expenses if technical service or support is needed besides the process costs, material costs, training cost and overhead costs (Kazmiercyk 1996). Hence, an organization's financial situation will determine the success and failure of the system. This problem is serious, especially in small and medium sized enterprise because they usually face scarcity or shortage of needed resources (Haksever 1996; Henricks 1992).

According to Gale and Sturm (1996), implementing an EMS requires that an interdisciplinary team posses a good mix of technical, socio-economic, expertise. Without adequate expertise, the process of implementing EMS may become difficult for the organization and it is unable to maximize the benefits of implementing EMS.

The roles, responsibilities and authority of the employees must be defined, documented and communicated to all organization members clearly and properly because of their direct impact on the environment (Sturm 1996; Johnson 1997). These steps are important in order to facilitate effective EM (Johnson 1997). Without clearly defined responsibilities, employees are unable to play their role properly and may result in conflicts with their existing work. Thus, the progress of EMS implementation will also be affected and consequently lead to failure.

Job load is another barrier that affect employees' decision in adopting EMS and obtain ISO 14001 certification in an organization. Implementing EMS in an organization, will increase employees' job loads because organizations need to follow the extra procedures and steps required by the ISO 14001 standard (Tan, 1999).

METHODOLOGY

The survey method was employed in this study. The instruments were divided into two sections consisting of respondents' demographic information and items on barriers to the implementation of EMS. A list of 35 variables using a 5-point Likert scale was used to identify the barriers to EMS implementation. Respondents must rate their agreements on each statement on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Respondents consist of managing director or equivalent from the manufacturing industries in Johor Bahru industrial park. 214 questionnaires were distributed out of which 92 questionnaires were returned and analysed. Principle component factor analysis was performed on the barriers to EMS implementation's instruments to determine its construct validity. Reliability analysis was also conducted to ensure the internal reliability of the said instrument.

FINDINGS

A reliability analysis was performed on the survey instrument and it yielded a Cronbach Alpha value of 0.9522. This shows that the instrument of the study has a very high level of reliability. The overall mean score of 3.05 indicates that respondents are more inclined to 'less agree' to the statements made. Table 1 shows the mean score for each statement.

Table 1: Mean Score

Items	Mean	Std. Deviation
Lack of technology to implement the ISO 14001.	3.00	1.04
Lack of data or information to implement the ISO 14001.	2.96	.95
Lack of trade association or business network support to implement the ISO 14001.	3.10	.93
Lack of government support to implement the ISO 14001.	3.09	.98
Lack of education and training to implement the ISO 14001.	3.11	.93
Lack of appropriate authorities given by top management to the person in charge of ISO 14001 implementation.	2.86	.99
Lack of understanding about environmental statement of ISO 14001.	3.01	1.11
Unclear responsibilities of employees to implement the ISO 14001.	2.97	1.13
There is no specific position in the organization to oversee the implementation of ISO 14001.	2.97	1.03
Inappropriate training program for the implementation of ISO 14001.	2.80	.98
Lack of education and training to implement the ISO 14001.	3.20	1.02
Lack of awareness of ISO 14001 benefit.	3.15	.88
Resistance to change among the employees.	3.13	.98
ISO 14001 involve too many requirements or procedures.	3.14	1.02
The implementation of ISO 14001 requires multiple skills and knowledge.	3.19	.92

The findings of this study reveal that the highest scores were for items relating to 'lack of education and training to implement the ISO 14001' and 'the implementation of ISO 14001 requires multiple skills and knowledge'. This indicates that the respondents see ISO 14001 EMS as complicated and thus there is a need to be properly trained in order to implement it.

Based on Table 2, the relatively high value of 0.889 for the Kaiser-Meyer-Olkin Measure of sampling adequacy indicates that the proportion of variance in the variables are caused by underlying factors hence allowing for the application of factor analysis. This is also supported by the Bartlett's test of Spherecity value of 0.00 which is less than 0.05 proving that the analysis is appropriate.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.889
Bartlett's Test of Spherecity	Approx. Chi Square	1988.341
	df	496
	Sig.	0.000

The results of the principal component factor analysis, based on VARIMAX rotation using an eigen value of one or greater as the criterion, along side the scree test, suggests a six-factor solution to the barriers to implementation of EMSs' instrument. However, only three factors were found to have reliability in terms of Cronbach's alpha. Examination of the content of the items loading on each factor resulted in the following names being applied to the various factors:

Table 3:

Factor 1	Infrastructure and network support
Factor 2	Organizational structure
Factor 3	Employees' readiness

A summary of the rotated factor analysis variables found in this study is presented in Table 4. Reliability analysis of these three factors shows satisfactory alpha values (more than 0.5).

Table 4: Summary Of The Rotated Factor Analysis Variables

Item	Factor		
	1	2	3
Lack of technology to implement the ISO 14001.	0.664		
Lack of data or information to implement the ISO 14001.	0.751		
Lack of trade association or business network support to implement the ISO 14001.	0.668		
Lack of government support to implement the ISO 14001.	0.633		
Lack of education and training to implement the ISO 14001.	0.627		
Lack of appropriate authorities given by top management to the person in charge of ISO 14001 implementation.		0.605	
Lack of understanding about environmental statement of ISO 14001.		0.766	
Unclear responsibilities of employees to implement the ISO 14001.		0.751	
There is no specific position in the organization to oversee the implementation of ISO 14001.		0.767	
Inappropriate training program for the implementation of ISO 14001.		0.613	
Lack of education and training to implement the ISO 14001.		0.623	
Lack of awareness of ISO 14001 benefit.			0.666
Resistance to change among the employees.			0.611
ISO 14001 involve too many requirements or procedures.			0.775
The implementation of ISO 14001 requires multiple skills and knowledge.			0.671
Cronbach's alpha	0.8575	0.8851	0.7929

Note: * only loading having absolute value greater than 0.600 are shown

Results indicate that there are three reliable dimensions of barriers to EMS implementations. The items loading onto factor 1 (infrastructure and network support), relate to barriers in the form of infrastructure and information provided by the government and business community on activities related to the implementation of EMS. Factor 2 (organizational structure) consists of six items which focuses on the availability of person(s) or department(s) responsible to ensure the implementation of EMS in the organization as well as providing sufficient training

program. The third factor (employees' readiness) includes issues related to the readiness and understanding of employees with regards to EMS implementation.

DISCUSSION AND CONCLUSIONS

Overall, the findings of the study seem to indicate that the barriers to the implementation of EMS in the manufacturing industries are related to:

1. the availability of the industry and government network support
2. the availability of person(s) entrusted to implement it. In another word, the ISO 14001 EMS is seen as complicated and only trained personnel with sufficient authority and knowledge are able to implement it successfully.
3. the readiness of employees to ensure acceptance and compliance of the system

The industry, government and statutory body like SIRIM, play a vital role in the adoption of EMS among industries in Malaysia. However, in a developing country like Malaysia, the lack of good governance, weak coordination between the specific authorities, a lack of statutory instrumentation, resources, implementation and enforcement of existing legislation, institutional capabilities and trained personnel, environmental awareness among the general public, and poverty are the main constraints to integrating environmental considerations into development planning (UNESCAP, 2003). Therefore, it is imperative for the government and the industry to get together and shared their knowledge and experiences to ensure greater acceptance and implementation of EMS.

Having a designated manager related to environmental management is able to raise the profile of pollution prevention in the business and operation plans of a firm, and increase the potential consideration of environmental impact in every business decision (Theyel, 2000). This is consistent with the finding of the study where environmental champion is required to ensure effective implementation of EMS. Without a body or person to champion environmental issues at the implementation level, and with project monitoring systems that are heavily biased towards physical and financial targets, it is no surprise that environmental measures often get relegated to the background (UNESCAP, 2003). However, having a designated manager may not be enough, as this individual also needs to be involved in the decision making of the firm.

Environmental awareness is still in its preliminary stage in Malaysia. There are still many who want bigger houses and greater mobility. If there is any collective protest at all, it is to express opposition to the location of disposal dumps for waste materials and toxic waste in accordance with the Not-In-My-Back-Yard (NIMBY) principle (UNESCAP, 2003). Thus there is an acute need for consumers as well as employees to adopt more environmentally conscious ways. The management may step up efforts to inform as well as train employees about the relative environmental merits of various efforts. Holding regular meetings and consultations between the management and employees is another vehicle to build awareness and consolidate participation for good environmental management. Attempts must also be made to emphasize the fact that environmental problems are connected and that employees must end its practice of resisting change while hoping others 'will do something' about the environmental deterioration. This will ensure greater understanding and acceptance of the EMS.

Malaysia has invested relatively little in environmental management to date. For example, in the solid waste management current methods tend not to recover costs. Recycling is limited to rag pickers in the informal sector (UNESCAP, 2003). Hence, to improve environmental management in Malaysia manufacturing industry, political will and the administrative commitment are necessary. Nevertheless, this study does indicate to a certain extent that there is some effort on the part of top management in Malaysia to implement EMS within their organization.

REFERENCES

Aboulnaga, I.A. 1998, 'Integrating Quality and Environmental Management as Competitive Business Strategy for 21st century', *Environmental Management and Health* [Electronic], pp. 65 – 71, in Pun, K.F. and Hui, I. K. 2001 in 'An Analytical Hierarchy Process Assessment of the 14001 Environmental Management System', *Integrated Manufacturing Systems*, pp. 333-345.

Bonifant, B., Arnold, M. and Long, F. 1995, 'Gaining competitive advantage thourgh environmental investments', *Business Horizons*, 38(4), pp. 37 – 48.

Chapman, T. S. 1994, 'Achieving Better Environmental Performance: Are You Ready?' Green Productivity, Hong Kong Productivity Council, no.4, Hong Kong, in Chin, K. S., Simon, C. & V. M. Rao Tummala

1999, 'An Evaluation of Success Factors Using the AHP to Implement ISO14001-based EMS', *International Journal of Quality & Reliability Management*, vol. 16, no.4, pp. 341-361.

Chattopadhyay, S. P. 2001, 'Improving the Speed of ISO 14000 Implementation: A Framework for Increasing Productivity', *Managerial Auditing Journal*, vol.16, no.1, pp. 36 – 39.

Clement, R. B. 1996, *Complete Guide to ISO 14000*, Prentice Hall, New Jersey in Hesan A. Quazi 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data System*,pp. 302-311.

Elkington, J. 1994, 'Towards the sustainable corporation: win-win-win business strategies for sustainable development', *California Management Review*, 36(2), pp. 90 – 100.

Everette, M., Mack, J.E. and Oresick, R. 1993, 'Toward greening in the executive suite' in K. Fischer and J, Schot 1993, 'Environmental strategies for Industry. International perspectives on research needs and policy implications', Washington, DC: Island Press, pp. 63 – 78.

Fischer F. and Black B. 1995, *Greening Environmental Policy – The Politics of A Sustainable Future*, Paul Chapman Publishing Ltd, London.

Gayler, D. 1997, 'Implementation of Environmental Management Standards in Australia', *Speech at APEC Seminar*, Singapore, in Hesan, A. Quazi 1999, 'Implementation of an Environmental Management System: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Hart, S.L. 1997, 'Beyond greening: strategies for a sustainable world', *Harvard Business Review*, January-February, pp. 66 – 76.

Henricks, M. 1992, 'Quality make a difference', *Small Business Reports, December*, pp. 29-38 in Hesan A. Quazi 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Hesan A. Quazi. 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Hillary, R. 1999, *Evaluation of Study Report on the Barriers, Opportunities and Drivers for SMEs in the Adoption of Environmental Management Systems*, *London: Network for Environmental Management and Auditing* [Online], Available: http://http://www.inem.org/htdocs/iso/hillary.html.[2002, June 9].

Hormozi, A.M. 1997, 'ISO 14000: The Next Focus In Standardization', *SAM Advanced Management Journal*, vol. 62. no. 3, pp. 32 – 41 in Hesan A. Quazi 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Howes, R., Skea, J. and Whelan, R. 1997, 'Clean and Competitive? Motivating environmental performance in industry', London: Earthscan.

Hughes, D. J. 1996, 'Environmental Management Systems', *Quality World, September* in Hesan A. Quazi 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Jackson, S. L. 1996, *ISO 14001 Implementation Guide: Creating an Integrated Management System*, John Willey and Sons, New York in Hesan A. Quazi. 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Johnson, P. L. 1997, *ISO 14000 Road Map to Registration*, McGraw-Hill, New York.

Kazemiekzyk, P. 1996, 'Environmental Management Systems', *The Bulletin, Spring* in Hesan A. Quazi 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Kuhre, W. L. 1995a, *ISO 14001 certification, Environmental Management Systems*, Prentice Hall, New Jersey, in Hesan, A. Quazi 1999, 'Implementation of an Environmental Management System: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Kuhre, W. L. 1995b, *ISO 14001 certification, Environmental Management Systems*, Prentice Hall, New Jersey, in Chin, K. S., Simon, C. & V. M. Rao Tummala. 1999, 'An Evaluation of Success Factors Using the AHP to Implement ISO14001-based EMS', *International Journal of Quality & Reliability Management*, vol. 16, no.4, pp. 341-361.

Lin, C. M. 1995, 'The Significance of ISO 14000 Environmental Standards for Asia-Pacific', *APO Productivity Journal*, vol. 4, pp. 65-82 in Chin, K. S., Simon, C. & V. M. Rao Tummala. 1999, 'An Evaluation of Success Factors Using the AHP to Implement ISO14001-based EMS', *International Journal of Quality & Reliability Management*, vol. 16, no.4, pp. 341-361.

Nordstrom, A. 1998, *EMS-Does It Payoff? A study of Swedish small and medium sized enterprises*, The International Institute For Industrial Environmental Economics [Online], Available: http://www.lu.se/IIIEE/publications/theses-98/ann_abst.html. [2002, June 28].

Porter, M.E. and Van der Linde, C. 1995, 'Green and Competitive: ending the stalemate', *Harvard Business Review*, September-October, pp. 120 – 134.

Pun, K.F. & Hui, I. K. 2001, 'An Analytical Hierarchy Process Assessment of the 14001 Environmental Management System', *Integrated Manufacturing Systems*, pp. 333-345.

Ritchie, I. & Hayes, W. 1998, *A Guide to the Implementation of the ISO 14000 Series on Environmental Management*, Prentice Hall, New Jersey.

Robbins, S. P. & Coulter, M. 1999, *Management*, 6th edn, Prentice Hall, New Jersey.

Shrivastava, P. 1997, *Bhopal: Anatomy of a Crisis*, Ballinger Publishing Co., Cambridge in Quazi, H.A. 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

SIRIM 2001, *SIRIM QAS Directory of Certified Product and Companies 2001*, pp. 250-258, SIRIM QAS Sdn. Bhd., Shah Alam.

SIRIM 2002, *Addendum to SIRIM QAS Directory of Certified Product and Companies 2001*, pp. 17-18, SIRIM QAS Sdn. Bhd., Shah Alam.

Speerli, F., Züst, R. 1995, 'The Relationship Between Environmental Management System and Design for Environment', *International Conference on Engineering Design ICED 95*, Praha, August, pp. 22-24.

Sweatman, A., Simon, M., & Blomberg, S. 1997, 'Integrating Design for the Environment within An Environmental Management System', ICED 97, Tampere [19-21 August] in Santos-Reyes D.E. & Lawlor-Wright T. 2001, 'A Design for the Environment Methodology to Support an Environmental Management System', *Integrated Manufacturing System,* vol. 12, no. 5, pp. 323-332.

Tan, C. P. 1999, 'Successful Implementation and Maintenance ISO 14001 Environmental Management System', *Conference on Experience and Implementation of ISO 14000 Environmental Management Systems*, pp. 18-19 in Chon, H. S., Mohd Saffry Ibrahim, Norlina Ibrahim, Ratnawati @ Nurul Hana Nashirudin & Teng, L. M. 2001, *Kelebihan Bersaing yang dinikmati oleh Syarikat-syarikat yang mendapat Pengiktirafan ISO 14000 di Malaysia*, Universiti Teknologi Malaysia, Johor Bahru, Unpublished Thesis.

Theyel, G. 2000, 'Management practices for environmental innovation and performance', *International Journal of Operations & Production Management*, Vol. 20 No. 2, 2000, pp. 249-266.

United Nations Economic and Social Commission for Asia and the Pacific Report, 2003, "INTEGRATING ENVIRONMENTAL CONSIDERATIONS INTO ECONOMIC DECISION-MAKING PROCESSES AT LOCAL LEVEL:THE CASE OF KUALA LUMPUR, MALAYSIA" [Online], Available http://www.unescap.org/drpad/publication/integra/volume2/malaysia/2my005.htm[2004, July 9].

Woodside, G. & Aurrichio, P. 2000, *ISO 14001 Auditing Manual*, McGraw-Hill, New York.

Wu, T.M. & Tan, I. 1996, 'ISO 14001 – Its Impacts on Productivity and Competitiveness', *Productivity Digest, PBS, July*, pp. 2 – 8 in Quazi, H.A. 1999, 'Implementation of an Environmental Management: The Experience of Companies Operating in Singapore', *Industrial Management & Data Systems*, pp. 302-311.

Zhi, Hui Zhang, Li, Yin Shen, Peter E.D., Love & Graham Treloar 2000, 'A Framework for Implementing ISO 14000 in Construction', *Environmental Management and Health,* vol. 11, no. 2, pp. 139-149.

Market-Based Instruments for Environmental Protection:
Piloting Presumptive Charge and Emissions Trading in Malaysian SMIs[1]

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ABSTRACT

The Government advocates expanded use of market-based instruments (MBIs) in high-level planning, including the Seventh and Eighth Malaysia Plans and the National Economic Recovery Plan. The palm oil and rubber mills effluent charge system implemented in 1978 in Malaysia was one of the first (MBIs) in the world that is still functioning today. Another successful use of MBIs for other environmental problems has been limited to the differential pricing on leaded and unleaded petrol, introduced in 1994. User fees charged by treatment facilities for scheduled waste (Kua1iti Alam) and centralized wastewater treatment plants at industrial estates (e.g., Bukit Kemuning) can be regarded as recent examples of MBIs.

Malaysian documents often refer to all economic instruments as MBIs. Our paper first clarifies the differences between MBIs and other environment-related economic instruments, such as the fiscal and financial incentives. We also highlight the differences between MBIs and "command and control" (CAC) approaches.

We review previous studies and reports on Malaysia's experience in the use of MBIs, and finally, assess the feasibility of introducing two new promising MBIs: a **presumptive charge** on input material containing toxic or hazardous substances for the textiles industry, and an **emissions trading system** for BOD for food processing industries.

INTRODUCTION

Malaysia was one of the first few countries in the world to implement market-based instruments (MBIs) for environmental protection when, in 1978, it introduced charges on effluent from palm oil and rubber mills. This effluent charge system is still functioning today, more than twenty-five years later. Despite this pioneering effort, Malaysia has made little use of MBIs for addressing other environmental problems, except for the differential pricing of leaded and unleaded petrol that was introduced in 1994. However, neither the agro-based effluent charges nor the differential pricing of petrol represent pure applications of MBIs; in both cases, command elements were also important. User fees charged by treatment facilities for scheduled waste (Kua1iti Alam) and centralized wastewater treatment plants at industrial estates (e.g., Bukit Kemuning) can be regarded as recent examples of MBIs. In some ways, these user fees are more "market-based" than the earlier examples because they involve transactions between private parties.

The Government has advocated expanded use of MBIs in high-level planning documents issued both before, during and after the financial crisis. The *Seventh Malaysia Plan 1996-2000* and the *Eighth Malaysia Plan 2001-2005* made several references to MBIs:

- "In order to further substantiate efforts to promote sustainable development, innovative economic mechanisms will be instituted to supplement legislative and enforcement means to encourage the private sector to adopt and develop environmentally-sound technologies." (7MP: p. 589)

- "This legal and regulatory framework [i.e., the Environmental Quality Act and associated regulations] will be complemented by the use of innovative economic and tax instruments such as presumptive charges which collect payment based on presumed annual total pollution discharge, forest taxes based on impacts of different types of activities, pollution charges based on levels of compliance. ..." (7MP: p. 606)

- "... the imposition of fees will be considered for wastewater discharge." (7MP: p. 608)

- "Efforts will also be channeled at promoting environmental performance measurements and market-based instruments as well as engaging communities in addressing environmental and natural resource issues." (8MP: p 539)

- "… increasing the use of fiscal policy in pursuit of environmental objectives and promoting the use of appropriate market-based instruments and self-regulatory measures among industries. … (8MP: p.549)

The National Economic Recovery Plan (NERP), issued in August 1998 endorsed **MBIs** as medium- and longer-term measures for reducing environmental degradation in the country, recommending "that an economic approach, via the usage of economic or market based instruments, be used in addressing environmental and resource issues" (pp. 141-142). It also stated that "taxes for the environment should be based on the polluter pays principle and should be calibrated according to the damage that a firm's pollution causes in the environment."

In this paper, we review Malaysia's experience with MBIs applied to pollution problems. We draw upon information from our study on textiles and food processing industries, and two primary documents: a book on economic approaches to natural resource and environmental management in Malaysia, *Environment and Development in a Resource-Rich Economy: Malaysia under the New Economic Policy* (Jeffrey R. Vincent, Rozali bin Mohamed Ali, and Associates, Harvard University Press for HIID, 1997), and a consulting report prepared for MOSTE and funded by UNDP, "A study of economic instruments for environmental policy in Malaysia" (Stein Hansen and Goh Kiam Seng, August, 1997). These two documents complement each other, as the latter draws extensively upon an early draft of the former and provides broader and more recent coverage of MBIs. The former provides a detailed analysis of the country's experience with the palm oil effluent charges in one of the chapters, i.e. chapter 10 and the related earlier publications by Khalid, 1993, 1994a, 1994b, 1884c, 1996.

We also assess the feasibility of introducing two new MBIs: a **presumptive charge** on input material containing toxic or hazardous substances, and an **emissions trading system** for BOD[2]. The presumptive charge is a promising instrument for improving collection and treatment of scheduled waste generated by the target SMI sector, textiles, while a BOD trading scheme for SMI food processors. In both cases, these new MBIs should apply to all companies, not just SMIs.

Before examining these specific instruments, we clarify the differences between MBIs and other environment-related economic instruments, such as the fiscal and financial incentives. Malaysian documents often refer to all economic instruments as MBIs. In fact, MBIs have certain distinguishing characteristics. We also highlight the differences between **MBIs** and **"command and control" (CAC)** approaches.

MBIs: KEY FEATURES AND GENERAL ISSUES

MBIs vs. fiscal and financial incentives

Both MBIs and environment-related fiscal and financial incentives can strengthen economic incentives for companies to invest in pollution control. The key difference is that only MBIs are fully consistent with the "polluter pays principle." They place the full burden of pollution control costs on pollution sources. In contrast, fiscal and financial incentives enable companies to share this cost with the public sector, by reducing companies' tax burden or a cost of capital. In this sense, they represent subsidies for pollution control. This is a point made in the UNDP/MOSTE report. MBIs make the act of discharging pollution more costly for companies, while fiscal and financial incentives make pollution control less costly. One is a stick, the other a carrot.

MBIs are "market-based" in that they require companies to pay for using the pollution disposal services of the environment, just as companies must pay for labor and other goods and services used during the production process. By giving pollution disposal a "price," MBIs induce companies to think of pollution disposal in the same way they think of goods and services they purchase in actual markets. This encourages companies to conserve on their use of the environment by reducing pollution discharge. This is the source of the ***incentive effect*** of MBIs.

Because they are linked directly or indirectly to pollution discharge, MBIs are part of the environmental regulatory system, while fiscal and financial incentives, which are linked mainly to environmental investment,

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[2] Biochemical Oxygen Demand (BOD) is one of the parameters used to measure water pollution.

are not. Consequently, companies always have an incentive to reduce pollution when faced with an MBI, even if they are not offered fiscal or financial incentives, while fiscal and financial incentives have this property only if companies also face MBIs or CAC measures. In our study we found that limited regulatory pressure appears to be a prime reason few companies have taken advantage of available fiscal incentives in Malaysia.

Properly designed MBIs promote *cost-effective* pollution control: they reduce the amount of expenditure required to achieve a given amount of pollution control for both individual companies and pollution sources in the aggregate (Khalid, 1994a). Subsidies like fiscal and financial incentives do not typically have this characteristic. In fact, because they reduce the cost of environmental expenditure from a company's standpoint, they have the opposite tendency. For example, financial incentives tend to encourage excessively capital-intensive solutions to pollution problems. Worse, when regulatory pressure is strong enough to induce companies to use fiscal or financial incentives to purchase pollution control equipment but too weak to induce them to operate it on a regular basis, the incentives sacrifice public funds for negligible environmental gains.

MBIs vs. CAC

Cost-effectiveness at the aggregate level - i.e., across pollution sources- is MBIs' main advantage compared to CAC. This advantage requires a bit more explanation. Marginal cost curves for pollution control typically slope upward: unit costs escalate as treatment reduces residual pollution concentrations to lower and lower levels. For example, the paper company Genting Sanyen reports that tertiary treatment of wastewater from paper manufacturing triples the operating cost of a wastewater treatment plant while reducing COD[3] concentration by less than 25 percent. MBIs induce companies to compare marginal cost to price. The objective is to minimize cost, and that "price" is the amount the company must pay if it discharges pollution into the environment, not the amount it receives for selling its output as in production decisions.

For example, suppose a company must pay an effluent charge on every ton of BOD it discharges into a river. The company can reduce its charge payments by treating its wastewater, but treatment is not free: marginal costs are higher for treatment processes that remove more of the BOD. A cost-minimizing company will remove BOD up to the point where the marginal cost of removal equals the effluent charge. If it removes more, the additional treatment cost exceeds the charge it would otherwise have paid. If it removes less, the additional charge exceeds the reduction in its treatment costs.

To illustrate, suppose that a company generates 1000 tons of BOD. Primary treatment enables it to reduce the concentration of BOD in its wastewater by half, which reduces its discharge by 500 tons. The unit cost of this technology is RM25/ton. A secondary treatment technology, which enables it to reduce discharge by an additional 300 tons, is also available. Its unit cost is RM40/ton. Finally, zero-discharge, removing the remaining 200 tons, requires the use of tertiary treatment, which costs RM100/ton. Now, suppose that the company faces an effluent charge of RM50/ton. Given its treatment cost schedule, the company minimizes the combined cost of treatment and effluent charges by investing in primary and secondary treatment, because their unit costs are less than the effluent charge. It avoids tertiary treatment, whose cost, RM20,000 (= RM100/ton x 200 tons), exceeds the charge payment on the remaining 200 tons, RM10,000 (= RM50/ton x 200 tons).

The aggregate cost-effectiveness of MBIs stems from the fact that marginal treatment costs vary across pollution sources. This variation reflects differences in company size, ownership, production technologies, managerial skill, access to technology, and other factors. It means that some companies can achieve a given discharge standard at a relatively low cost, while others must incur much higher costs to achieve the same standard. In this situation, requiring all companies to achieve the same standard - which is a normal feature of CAC - is not the most cost-effective means of reducing the aggregate pollution load. The cost can be reduced if companies with lower marginal costs remove more pollution and companies with higher marginal costs remove less. As long as marginal treatment costs differ, the aggregate cost can be reduced by continuing to reallocate pollution reduction from high cost to low cost abaters. Opportunities for cost-savings are exhausted when marginal treatment costs are the same for all firms.

In theory at least, this outcome occurs when MBIs are used. As discussed earlier, a company facing a pollution charge minimizes its costs by reducing pollution until its marginal treatment cost equals the charge. If the charge is the same for all polluters, then marginal costs must be the same for all polluters, too. MBIs and CAC are in a sense mirror images: CAC measures like uniform discharge standards sacrifice equal marginal treatment costs across sources in order to gain equal discharge concentrations; MBIs sacrifice equal pollution discharge concentrations in order to gain equal marginal costs. Both approaches can be used to achieve the same

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[3] Chemical Oxygen Demand, another parameter used to measure water pollution.

aggregate amount of pollution reduction, but MBIs do so at a lower cost. That is, in the aggregate, companies spend less money on pollution control under MBIs than under CAC.

Mixed systems and emissions trading

For pollutants that disperse easily and evenly into the receiving water or air, the variation in discharge concentrations that occurs under MBIs is not a problem from an environmental standpoint. Some pollutants, however, tend to create local "hot spots" if pollution loads are high in the immediate vicinity. For this reason, MBIs are often combined with discharge standards to form a mixed regulatory system that seeks to preserve some of the cost-effectiveness of MBIs while reducing the risk of "hot spots." A common example is to combine pollution charges with discharge standards by having a two-tiered charge, which is higher above the standard than below. This approach was followed in Malaysia in the case of the palm oil effluent charges. Although the standard introduces an economic distortion that reduces cost-effectiveness, the reduced risk of "hot spots" can justify its introduction (Khalid, 1996).

Charge *cum* standard systems provide more assurance that aggregate pollution control targets will be met than do pure pollution charge systems (Khalid, 1994b). Another MBI, emissions trading, provides even greater assurance. Under emissions trading, a company must hold a "permit" for every ton (or kilogram, etc.) of pollution it discharges. The company is violating the law if it discharges pollution exceeding the number of permits it holds. The total number of permits is determined by the environmental protection agency. In the long run, this amount should be linked to the assimilative capacity of the environment. The environmental protection agency must also devise a system for initially allocating the permits. Options include auction schemes, which take into account historical pollution loads of individual companies. Once the initial allocation is made, companies are free to buy and sell permits. Companies that would like to discharge more pollution must buy additional permits from other companies. In this way, the aggregate pollution load is "capped."

Emissions trading are the most "market-based" of MBIs, as it involves the creation of an actual market in which transactions occur and prices are determined by the interplay of supply and demand. It is consistent with the "polluter pays principle" because polluters must purchase permits to cover any pollution they discharge over and above their initial allocation. It promotes cost-effective pollution treatment, because polluters equate their marginal treatment costs to the market price of the permits.

Unlike pollution charges, an emission trading has not been tried in Malaysia, but has been studied and simulated (see Khalid, 1993, 1994a and the Appendix). Later in this paper, we will discuss the feasibility of introducing a pilot scheme for BOD.

MALAYSIAN EXPERIENCE WITH MBIs FOR POLLUTION CONTROL

The UNDP/MOSTE study provides the most comprehensive survey available on Malaysia's experience with MBIs. The study produced two reports. The phase 1 report, which was completed in May 1996, reviewed existing MBIs at the federal, state, and local levels in Malaysia, other Asian countries, and Scandinavia. It covered what it termed "tax incentive structures": "taxes, charges, tax differentiation schemes, performance bonds, and deposit-refund schemes." That is, it covered fiscal incentives as well as true MBIs. It addressed natural resources like minerals, timber, fisheries, and water as well as air and water pollution and solid waste. It drew heavily on *Environment and Development in a Resource-Rich Economy* as a source of information on natural resources.

The phase 2 report focused more exclusively on Malaysia, although it brought in lessons from other countries. It provided recommendations for improving the performance of existing instruments and information on new instruments that appear to hold promise for implementation in Malaysia. Box 1 lists the instruments it covered.

Box 1
MBIs Discussed in Phase 2 Report of UNDP/MOSTE Study

1. Water pollution
   - User fees for municipal wastewater (sewage)
   - Palm oil and rubber effluent charges
   - Palm oil and rubber research cesses
   - Charge on agrochemicals (fertilizers and pesticides) *[new instrument]*
   - Performance bonds to reduce sedimentation from logging, road construction, and land development *[new instrument]*
   - Emissions trading *[new instrument]*

2. Water supply
   - User fees for piped water
   - Charges for irrigation and drainage
   - Charges for groundwater depletion *[new instrument]*

3. Air pollution from mobile sources
   - Fuel prices
   - Vehicle purchase taxes and annual ownership fees
   - Airline passenger tax
   - Differentiated charge on sulfur content of diesel fuel *[new instrument]*
   - Area licensing scheme for traffic congestion *[new Instrument]*
   - Charges on CO_2, NO_x, and CH emissions from aircraft *[new instrument]*

4. Air pollution from stationary sources
   - Oil and coal pricing for electric utilities
   - Peak load power pricing
   - Price differentiation for energy saving light bulbs
   - Differentiated charge on sulfur content of oil and coal *[new instrument]*
   - Charge on NO_x emission *[new instrument]*

5. Solid waste
   - Charges for municipal solid waste collection and disposal
   - Deposit-refund scheme for motor vehicles *[new instrument]* "
   - Charges on beverage containers and packaging *[new instrument]*

6. Scheduled waste
   - User fees for scheduled waste (Kualiti Alam)
   - Deposit-refund scheme for lubricant oils *[new instrument]*
   - Deposit-refund scheme for batteries *[new instrument]*
   - Deposit-refund scheme for electric and electronic waste *[new instrument]*

As this list indicates, the report contains less information on MBIs for natural resource management (other than water supply) than the phase 1 report. It also indicates that the report covers non-industrial pollution issues more thoroughly than industrial pollution issues, especially reviewing existing instruments. This is not surprising, given that Malaysia has implemented relatively few MBIs for industrial pollution. It is also appropriate from the broad perspective of environmental management in Malaysia, given that non-industrial sources are more significant than industrial sources for both air and water pollution.

The report analyzes in most detail the palm oil effluent charges, drawing primarily on *Environment and Development in a Resource-Rich Economy, 1997,* which was first published in Khalid (1993). It refers to this experience as a "blueprint" for a mixed MBI/CAC approach for addressing serious pollution problems in other industrial sectors. We also review this experience, and we provide some analysis of the relative roles of the charges and CAC features of the Crude Palm Oil Regulations in reducing the BOD load discharged by crude palm oil mills in section 3.1 below. The phase 2 report analyzes the second major example of a pollution-related MBI in Malaysia (albeit a non-industrial one), the differential pricing of leaded and unleaded petrol in section 3.2. We review this report and provide a more thorough analysis and reach a different conclusion about the significance of differential pricing in reducing the market share of leaded petrol. The phase 2 report makes no reference to user fees for centralized wastewater treatment at industrial estates which we provide in section

3.2 below. Finally, the phase 2 report comments on Kualiti Alam's user fees for scheduled waste management only in passing, which were just being introduced at the time the report was completed, and we analyze this MBI in section 3.4 below, and are especially relevant to SMIs.

More generally, the phase 2 report presents certain conclusions about MBIs that bear repeating:

•   *MBIs are cost-effective and promote innovation:* "Experience elsewhere in the world strongly suggests that as a result of introducing such dynamic environmental policy measures [i.e., MBIs], the affected industries that have innovative and dynamic leadership will accelerate the development and installation of new and more cost-effective processing and waste management techniques and procedures " (p. 3).

•   *Generation of government revenue is not the main objective of MBls:* "... this study is not about how to raise more revenue for Government. In fact, if successful, some economic instruments should as a result of reducing pollution raise no revenue whatsoever!" (p. 1).

•   *The costs of MBIs to industries are less than they appear:* "... in almost all cases, part of the immediate extra cost imposed by [an MBI] will be passed on forward to customers and backwards to suppliers of inputs. Only in exceptional cases will the industry targeted by the [MBI] bear the entire initial burden " (p. 3). This was one of the major findings in Khalid (1991) and Khalid and Braden, (1993).

•   *MBls should be introduced gradually:* "It is crucial to the consent of industry and the public at large that environmental policy measures are introduced in such a way that those affected are able to adapt. This means (a) that a schedule of gradual implementation must be presented, and (b) that those affected can rely on the Government commitment to the published implementation schedule as a basis for sound environment management investments." (p. 3)

•   *Administrative costs of MBIs are relatively low:* "... these taxes, tradeable permit systems, and cesses demand very low administrative expenses compared to conventional taxes such as personal income taxes." (p. 3)

•   *MBls require effective enforcement:* "... a necessary condition for success is that there is strict enforcement of whatever is implemented..." (p. 2)

•   These are consistent with our conclusions and underlie our recommendations in our study. The phase 2 report's recommendations for new MBIs related to industrial pollution are also generally consistent with ours. We comment on them at the end of this paper, when we present our recommendations for presumptive charges and emissions trading.

Palm oil effluent charges

The charges on effluent from crude palm oil mills (CPO) and rubber mills are structured similarly. We focus on the former, which have been analyzed more thoroughly. We draw primarily upon Chapter 10 in *Environment and Development in a Resource-Rich Economy*, which contains much more detail than is presented here. We highlight lessons for the design and implementation of new MBIs.

The Department of Environment (DOE) announced the Crude Palm Oil Regulations on July 7, 1977. The regulations declared crude palm oil mills "prescribed premises" that must apply for an operating license every year. They imposed discharge standards for BOD and seven other parameters in palm oil effluent. They linked the size of a mill's annual license fee to its projected BOD load. The fee was RM10 per tonne for BOD concentrations up to the standard and RM100 per tonne for exceedances.[4] The regulations announced a standard of 5,000 mg/l effective July 1, 1978. Hence, an average- sized mill that discharged 100,000 tonnes of effluent with a BOD concentration of 12,500 mg/i owed RM5,000 for the BOD it discharged within the standard (RM10/tonne x 100,000 tonnes x 5,000 mg/l) and RM75,000 for the exceedance amount (RM100/tonne x 100,000 tonnes x 7,500 mg/l, the difference between the concentration and the standard). The license fee thus amounted to a two-tiered effluent charge. To monitor the accuracy of the mills' projections, the regulations required them to file "quarterly returns" every three months, which reported actual amounts of effluent discharged and average BOD concentrations.

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[4] This is for discharge into waterways. There are also fees for discharge onto land.

Crude palm oil mills were the single worst source of water pollution in the country before the introduction of the regulations, and they were a growing problem. The daily BOD load discharged by the industry rose from less than 100,000 tonnes in 1965 to more than 500,000 tonnes in 1977. But in the first year of the regulations, the load fell by more than half. It continued to fall in succeeding years, despite a significant expansion in the number of crude palm oil mills. By the mid-1980s, the BOD load was less than 1 percent of the 1977 level.

Although the dramatic decrease in BOD load coincided with the introduction of the effluent charges, the former was not due primarily to the latter. The regulations also included significant CAC features. The main one was that compliance with the BOD standard was mandatory after the first year. Mills no longer could choose either to comply or to pay the RM100/tonne exceedance charge: they needed to comply. The DOE signaled its intention to enforce the standards by suspending the operating licenses of violators, starting with the highly publicized case of a mill on the Sungai Langat in November, 1979. Any incentive effect from the remaining RM10/tonne charge on the BOD load within the standard was overwhelmed by a rapid tightening of the standards. The regulations announced an increasingly stringent set of standards, from 5,000 mg/l on July 1, 1978 to 2,000 mg/l on July 1, 1979; 1,000 mg/l on July 1, 1980; and 500 mg/l on July 1, 1981. The DOE tightened the standards further on July 1, 1982, to 250 mg/l, and July 1, 1984, to 100 mg/l. The enforcement of increasingly stringent discharge 17: standards, not the imposition of effluent charges, thus drove the reductions in BOD loads after 1978.

Because the regulations announced the tightening of the standards, even the reduction during the first year, when the standard was not mandatory, was not due entirely to the effluent charges. The DOE estimated that the RMIOO/tonne exceedance charge was approximately double the average cost of achieving the initial standard. It expected the charge to encourage mills to begin operating treatment facilities during the first year instead of waiting until the standard was mandatory. The charge had this effect. But at the same time, mills knew they faced increasingly stringent standards that would be mandatory after the first year, and they built their treatment systems accordingly. That is, they built them to meet future, not just current, standards. The reduction in BOD load during the first year thus reflected not only the static incentive effect of the charges - mills comparing their marginal treatment cost curves to the charges - but also the pressure to ensure that the treatment system would be able to satisfy tighter standards in twelve months time, so that mills would be allowed to operate.

Many mills chose to pay the exceedance charge during the first year instead of complying with the standard. This is evidence that the charges generated some cost savings by enabling mills to avoid even higher treatment costs. But the mandatory, increasingly stringent standards curtailed the cost-effectiveness of the RM10/tonne charge, which remained in effect, in subsequent years. Potential cost-savings were also mitigated by the fact that many mills were quite similar and had similar treatment options. Hence, their marginal treatment cost curves did not differ much. A simulation analysis of ten mills on the Sungai Johor estimated that the cost of achieving the aggregate pollution reduction associated with a discharge standard of 5,000 mg/l was 16.5 percent higher than the same reduction achieved via an effluent charge (see Appendix). This is not large compared to the estimated cost savings reported in other studies of MBls. For a discharge standard of 100 mg/l, the difference was even smaller, less than 1 percent.

Despite the fact that their incentive effect and their cost-effectiveness were muted, the palm oil effluent charges offer several useful lessons for pollution regulation in Malaysia.

1. **firm action against pollution discharge does not necessarily prevent industrial expansion**. Output of crude palm oil has more than tripled since the regulations went into effect.
2. **the regulations were designed in consultation with industry and the research community**. These ware feasible in light of available technology, or technology that could reasonably be developed.
3. **they were pre-announced and phased in**. These gave industry time to adjust.
4. **both MBIs and CAC require an effective enforcement effort**. The self-reporting of BOD loads by crude palm oil mills via the quarterly returns, which are the source of information for both the charge calculations and the checking of compliance with discharge standards, is backed up by site visits by DOE officers. As noted above, violators are subject to severe penalties.
5. **given the opportunity to do so, industries respond to pollution control regulations through more than end-of-pipe solutions**. Although most mills have met the standards by building treatment ponds, a significant number have developed commercial byproducts from the effluent and thus avoided the costs of treatment as well as pollution charges. Byproducts include animal feed, fertilizer, and biogas. DOE did not direct mills to use specific: technologies to treat their effluent, and mills responded to this flexibility in innovative ways.

All these lessons potentially apply to SMIs. Another set of lessons helps explain why, government action was seemingly much more concerted in the case of palm oil effluent than it has been in the case of pollution from

SMIs. The palm oil effluent problem had certain characteristics that improved the politics of a regulatory response: (see Khalid, 1996).

- The problem was obvious and significant (many rivers were literally choked with effluent, making them unusable for drinking, bathing, fishing, etc.)
- The source of the problem was obvious and well-defined (i.e., crude palm oil mills)
- The parties suffering from the problem (mainly rural *bumiputera)* were politically influential
- The parties causing the problem (many mills were foreign-owned) were less influential
- Prospects for developing affordable technologies to address the problem appeared good

Contrast these characteristics to those of SMI pollution problems: some of the more important pollutants discharged by SMIs (e.g., heavy metals) are insidious; SMIs are dispersed, individually often discharge relatively small amounts of pollution, and are typically not the only sources of those pollutants in a given area; the parties suffering from SMI pollution may not know they are being exposed; the sources of the problem, SMIs, are politically favored; and costs of treatment technologies appear high relative to the scale and resources of SMIs.

Differential pricing of leaded and unleaded petrol

The second primary example of a charge-based MBI in Malaysia is the differential pricing of leaded and unleaded petrol. This instrument is quite different from the palm oil effluent charges, as it pertains to air pollution instead of water pollution, non-industrial mobile sources instead of stationary industrial sources, and a charge on a product instead of a pollutant. But Malaysia's experience with the two instruments is fundamentally similar in that both were associated with CAC measures that were ultimately more responsible for the significant reduction in pollution emissions achieved. Nevertheless, the differential pricing of petrol offers a useful precedent for presumptive charges on other inputs linked to particular pollution problems, and for that reason it is worth examining here.

Malaysia introduced 97 octane-unleaded petrol on December 1, 1991.[5] The Government, which controls the prices of petroleum products,[6] set the price at 113 sen/l. This was the same as the price of 97 octane leaded petrol. The Government achieved this price parity by reducing customs duties on unleaded petrol, whose international price was higher at that time. *The* 1992 *Budget* justified this action by stating, "We need to pay for clean air" (p. 46). It was not until January 1, 1994, however, that the Government introduced a true price differential, when it reduced the price of unleaded petrol to 110 sen/l. It maintained the price of leaded petrol at 113 sen/l.

The market share for unleaded petrol was 31 percent in both 1992 and 1993, when its price was the same as that of leaded petrol. In 1994, when the price differential was introduced, its share jumped to 48 percent. It jumped by even more in 1995, to 68 percent, and it has continued rising every year since. The Government has announced plans to phase out leaded petrol altogether during the first quarter of 1999. Representatives of the petroleum industry confirm that they stopped producing leaded petrol as of January 1, 1999 and that the only leaded petrol that is now available for sale comes from remaining stocks.

The coincidence of the introduction of the price differential and the upward trend in market share for unleaded petrol suggests that the price differential had a strong incentive effect. As in the case of the palm oil effluent charges, however, this conclusion is not completely correct. The 3 sen/l price differential probably was instrumental in convincing a number of motorists to try unleaded petrol in 1994, but it existed only in that year. On January 1, 1995, the Government changed the octane levels of leaded petrol, eliminating the two existing grades, 97 octane and 85 octane, and introducing a new grade, 92 octane. It priced 92 octane leaded petrol at 106 sen/l i.e. 4 sen/l *below* the price of 97 octane-unleaded petrol.

One therefore cannot attribute the continuing increase in market share for unleaded petrol after 1994 to a lower relative price. The explanation instead involves two other factors. First, consumers who wanted to buy high octane petrol for their vehicles had no choice but to buy unleaded after January 1, 1995. The 20-point jump in market share for unleaded during 1995, from 48 percent to 68 percent, probably reflects mainly consumers who were willing to pay an extra 4 sen/l for an extra 5 octane/l. Second, Proton, the leading seller of automobiles in

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[5] This was preceded one year earlier by a reduction in the lead content of petrol from 0.84 to 0.15 grams per liter, as required by the 1985 Control of Lead Concentration in Motor Gasoline Regulations. See *Seventh Malaysia Plan 1996-2000,* p. 593.
[6] Technically, the Government sets maximum prices, but according to the Ministry of Domestic Trade and Consumer Affairs, companies rarely charge less than the maximum amount.

the domestic market, began phasing out production of passenger vehicles with engines designed for leaded petrol in the early 1990s. The changing composition of the vehicle fleet explains why there was substantial demand for unleaded petrol even in 1992-93, before the price differential was introduced. The Government coordinated the introduction of unleaded petrol with the promotion of locally manufactured vehicles with engines advertised as designed to use it.

The shift in leaded/unleaded market shares is therefore not a simple story of market responses to a price differential. Instead, it represents the combined impact of a CAC supply action (eliminating high-octane leaded petrol, and ultimately eliminating all leaded petrol) and a CAC demand action (eliminating production of vehicles using leaded petrol). The price differential contributed to the shift in the one year that it was operative (1994), but it was not the only factor in that year and not a factor at all in subsequent years.

User fees for centralized wastewater treatment

Bukit Kemuning Electroplating Park is the first industrial estate in Malaysia with a centralized facility for treating wastewater containing toxic compounds. The owner of the treatment plant, Bank Industri and Press Metal Berhad (BI-PMB) Waste Management Sdn. Bhd., operates the plant on a for-profit basis. Companies in the industrial estate pay BI-PMB user fees for the wastewater treatment services they receive. Those fees represent applications of the polluter pays principle. In fact, the fees are even more purely market-based than the palm oil effluent charges, as the Government does not set the rates or collect the revenue. The system operates entirely within the private sector.

The treatment technology is of German origin. It is aimed at four main types of pollutants: chromium, cadmium, acids, and alkali. It is designed to remove 98-99 percent of the pollution load from the wastewater. DOE tests the effluent from the treatment plant monthly. The compliance rate has been above 90 percent so far. The treatment process generates sludge, which BI-PMB sends to Kualiti Alam's Bukit Nanas facility for treatment.

BI-PMB meters the amount of wastewater each factory generates. It bases each factory's monthly user fee on the amount of wastewater, the concentration of specific pollutants in it, and the unit cost of treating wastewater with those characteristics (including a 15 percent profit margin). Hence, factories that generate more waste, and waste that is more difficult to treat, pay higher fees. This creates an incentive to reduce the amount of waste generated (e.g., through the adoption of cleaner technologies) and to shift toward plating processes that involve less toxic solutions. Companies sign annual contracts with BI-PMB that provide detailed information on the fees and how they are calculated.

BI-PMB projects that the average monthly user fee will be approximately RM2000 per factory. This appears to be consistent with the available information on BI-PMB's costs. Bukit Kemuning provides evidence that a centralized treatment facility reduces wastewater treatment costs for SMIs. According to BI-PMB, an individual electroplating factory would need to pay about RM100,000 for treatment equipment alone if it decided to build its own treatment plant. The total cost for 32 factories would thus be RM3.2 million, which is 60 percent more than the cost of the treatment equipment at Bukit Kemuning. Centralized treatment offers substantial economies of scale, and thus substantial savings for SMIs.

There is also evidence that the user fees will indeed induce SMIs to introduce cleaner processing technologies. One electroplating company, which was preparing to relocate to Bukit Kemuning stated that the prospect of paying the user fees had already prompted it to investigate recycling and other process changes as means of reducing its monthly payments. Such responses are analogous to the ones made by crude palm oil mills in response to the Crude Palm Oil Regulations.

To avoid putting SMIs in a position of paying either unduly high user fees to BI-PMB or unduly high costs for their own treatment plants, the Government should encourage companies in addition to BI-PMB to build industrial estates with centralized wastewater treatment plants. A number of fiscal incentives for doing this already exist, or would exist if existing incentives were modified. Offering these incentives is not enough, however; the Government must also minimize obstacles to obtaining them.

User fees for scheduled waste management

The centralized services that Kualiti Alam provides companies generating scheduled waste are analogous to those that BI-PMB provides electroplating companies at Bukit Kemuning, albeit on a much larger geographical

scale and in a more comprehensive and integrated fashion. Kualiti Alam Sdn. Bhd. is a private company that was formed on December 9, 1991. It is a consortium of three companies, two Malaysian and one Danish. UE Construction Sdn. Bhd., whose primary businesses are engineering and construction, has a 50 percent equity stake. Arab-Malaysia Development Bhd., which is diversified into many activities, has a 25 stake. Danish Waste Treatment Services A/S has a 25 percent stake.

On December 18, 1995, Kualiti Alam and the Government signed an agreement that gives the company the exclusive right to provide scheduled waste management services in Peninsular Malaysia for 15 years. These services include:

1. Waste analysis,
2. Waste transportation,
3. Waste treatment,
4. Waste incineration, and
5. Waste disposal.

Kualiti Alam opened its waste management centre in Bukit Nanas, Negeri Sembilan, in 1998. The centre was designed to handle 90 percent of the industrial scheduled waste generated in the Peninsula. It is able to treat all 107 scheduled wastes listed in the Scheduled Wastes Regulations, but it does not handle explosive, radioactive, or infectious hospital wastes. Its treatment technologies include stabilization solidification, physical/chemical treatment, and incineration. It has a secure landfill for final disposal of treated wastes.

For management purposes, Kualiti Alam classifies scheduled waste into the eight groups. Its treatment fees are linked to those groups. Its waste transportation fees are based solely on trucking distances from the Bukit Nanas facility. That is, they are not differentiated by type of waste. They are quoted in RM per tonne, include applicable tolls, and are uniform within a given state.

The annual treatment capacity of the Bukit Nanas waste management centre is approximately 75,000 tonnes, allocated among the three technologies as follows:

- Stabilization/solidification : 25,000 tonnes
- Physical/chemical : 20,000 tonnes
- Incineration : 30,000 tonnes

Kualiti Alam's fee schedule, which shows great differences between rates for waste that can be directly landfilled and waste that requires some form of treatment before disposal, suggests that treatment technologies offer the greatest scope for cost savings. This also makes intuitive sense, as new treatment technologies are continually being developed. Indeed, the Government's own fiscal incentives include Pioneer Status or Investment Tax Allowance (ITA) for the "Development and production of biotechnology processes for waste treatment". Malaysia will be more likely to identify and pilot test more cost-effective treatment technologies if many companies, not just one, are in the market for them. The fact that the Bukit Nanas waste management centre is designed to handle 90 percent of the scheduled waste generated by industries in Peninsular Malaysia, not 100 percent, and the availability of accelerated depreciation allowance for "facilities to store, treat, and dispose toxic and hazardous waste by companies that generate waste", signal that the Government does not object to companies treating (and even disposing) their own scheduled waste. Furthermore, the example of Bukit Kemuning Electroplating Park indicates that the Government eventually decided that on-site treatment by industrial estates, with one company providing treatment services for others, does not violate its agreement with Kualiti Alam. Given these precedents, the Government should not delay in approving technically sound proposals from companies other than Kualiti Alam for facilities to treat their own scheduled waste or centralized treatment facilities at industrial estates.

According to information the Federation of Malaysian Manufacturers (FMM) received from the Ministry of Science , Technology and Innovation (MOSTI), what *would* violate the Government's agreement with Kualiti Alam would be a facility outside an industrial estate that treats waste from waste-generating companies other than the one that built it. This is not surprising, as it would create a true market in waste treatment services, with many sellers as well as many buyers. The Government should allow such facilities once its agreement with Kualiti Alam expires. It should consider allowing them even sooner if Kualiti Alam provides inadequate services (e.g., if its capacity cannot handle the quantity of waste requiring treatment), although its legal basis for doing so depends on the specific language in the agreement.

PROPOSED NEW MBIs FOR INDUSTRIAL POLLUTION

One of the main recommendations of our study is to call for a study, to design "a limited number of implementation-oriented pilot studies". We emphasize the need to tailor MBIs to suit specific circumstances: considerable analysis is required before pilot projects can actually be implemented. We would propose **presumptive charges** on products containing toxic substances such as the textiles industry and **emissions trading** (i.e., tradeable discharge permits) for water pollution such as in food processing industries.

We believe that these are attractive candidates for further consideration, and we discuss them in more detail in this section. Unfortunately, we were not able to conduct quantitative economic analyses of these instruments, for several reasons. First, plant-level data on pollution emissions and pollution control costs are virtually nonexistent in Malaysia. These data are necessary for estimating marginal cost curves and the potential cost savings from MBIs compared to CAC. Although Malaysia's system for collecting data on ambient air and water quality appears to be one of the best in Asia, its system for collecting emissions data is one of the worst. One of our prime environmental information recommendations is that DOE should initiate a regular survey of plant-level pollution emissions and pollution control costs. Second, design of MBIs, which as noted earlier are part of the environmental regulatory system, requires close collaboration with environmental authorities. Any subsequent projects directly concerned with the design and implementation of MBIs should have DOE as implementing agency and a project office in DOE.

Presumptive charge for inputs containing toxic or hazardous substance

A presumptive charge offers a promising way for Kualiti Alam to provide seemingly free waste collection and treatment services without causing either it to go broke or waste-generating industries to get a free ride. It can be structured as an **advanced disposal fee** levied on inputs containing toxic and hazardous substances. As a charge on an input instead of a pollutant, it bears a certain similarity to the higher price that the Government charged on leaded petrol. It also appears to be consistent with the Customs, Excise, and Sales Tax Acts. A hypothetical example for the dyeing and finishing (D&F) industry illustrates how it might work in Malaysia.

Many dyes contain toxic substances that contaminate the D&F industry's waste. Under Malaysian law, this waste must be treated in accordance with the Scheduled Wastes Regulations. Currently, however, many D&F houses dispose of such waste through inappropriate means rather than paying what they view as Kualiti Alam's high prices.

The presumptive charge system would have two principal components. The first would be the charge mechanism itself. Suppose that a particular dye costs RM15/kg, and that on average 20% of the dye winds up in the sludge from D&F operations. Furthermore, suppose that Kualiti Alam's charge for collecting the sludge is equivalent to RM5/kg of waste dye. Then, the presumptive charge would be calculated as:

$$20\% \times RM5/kg = RM1/kg.$$

This charge would be added to the market price of the dye, thus raising the price from RM15/kg to RM16/kg.

The second component would be the rebate mechanism. Companies that dispose of their sludge properly should receive a rebate, or else they would be double-charged for it. Here, there are several options. The simplest would be for the charge to be treated as an advance disposal fee: Kualiti Alam would collect the sludge free of charge, and then it would invoice the Government (say, monthly or quarterly) for the associated collection and treatment costs. That is, companies would not receive a rebate directly; instead, they would receive it in kind, in the form of "free" collection and disposal services. Several states in the U.S. have employed this approach to encourage households and companies to deliver waste material containing toxic and hazardous substances to approved collection and treatment centres.

Because they would not need to pay directly for waste collection and treatment, D&F houses would have no reason not to allow Kualiti Alam to collect their waste. They would thus be more likely to comply with the Scheduled Waste Regulations. But because they *would* be paying a premium for more toxic dyes, they would still have an incentive to shift toward safer dyes and to waste less dye during processing, for example through the adoption of better housekeeping practices and cleaner technologies.

Revenue from the presumptive charge would be fully sufficient to cover Kualiti Alam's reimbursement claims, as long as: (i) the calculations underlying the charge are sound, and (ii) the quantities claimed in Kualiti Alam's invoices match the actual amounts of waste it collects. The former involves mass-balance calculations familiar

to environmental engineers. DOE would need to update these calculations regularly as industrial processes change. The latter should be relatively easy to monitor, through random comparisons of Kualiti Alam's invoices and D&F houses' receipts (which they need to demonstrate compliance with the Scheduled Waste Regulations).

This system would simplify Kualiti Alam's financial accounting and collection procedures dramatically. Instead of having to collect payments from thousands of waste-generating companies, Kualiti Alam would invoice a single "client" - the Government, which would have collected in advance all the revenues needed to pay the invoice. The system would not necessarily require any new administrative apparatus. For example, if the dyes in question are mainly imported - which is indeed the case in Malaysia - then the charge could be administered as an ordinary import duty.[7] If some of the dyes were made locally, which is one of the objectives of the Industrial Master Plan 2 (IMP2), then the charge would also need to be administered as an ordinary excise duty. Systems a1ready exist in Malaysia for the collection of both import and excise duties, through the Customs Service.

While this example focuses on dyes used by the textile industry, the system could be applied to any intermediate input that contains toxic and hazardous substances. Other obvious inputs that would be good candidates for a presumptive charge include chemicals used by metal finishers, oil and grease used by repair shops, solvents used by the chemical industry, and so forth. In these cases as well as dyes, the charge would apply to purchases by all companies, not just SMIs. While one could conceive of a system with charge levels that were lower for SMIs than for large companies, such a system would involve administrative complications for all parties involved (companies, the Government, and Kualiti Alam).

Emissions trading program for BOD

The United States has more experience with emissions trading than any other country. It has implemented programs for both air and water pollution. Best known is the SO_2 Allowance Program, which is a national program, aimed at reducing SO_2 emissions from power plants. It was introduced in the early 1990s and includes several thousand sources. The U.S. Environmental Protection Agency estimates that it has reduced the power industry's expenditure on pollution control by 60 percent, while simultaneously reducing emissions. Other studies estimate lower cost savings, on the order of 20-40 percent, but these are still large amounts. The water trading programs are all limited to specific river basins. The state of North Carolina has used trading to lower the costs of reducing nutrient loads (nitrogen and phosphorus) from point and non-point sources in the Tar-Pamlico River basin. For example, wastewater treatment plants can finance relatively inexpensive actions to reduce fertilizer runoff from farms (e.g., converting cropland in riparian zones to grass) in lieu of more costly upgrading of treatment facilities. Participants report that they have spent less on pollution control than they would have spent if they had faced more rigid regulations. In some other cases, e.g. the Fox River in Wisconsin, excessive restrictions on trading have prevented potential cost savings from being fully realized. Emissions trading programs come in a variety of forms. The most "market-based" are allowance programs. The government annually issues a limited number of "allowances," each of which confers the right to discharge one unit of a specified pollutant. Allowances can be freely bought and sold as long as sellers have a surplus (their allowance holdings exceed the pollution load they discharge). Additional requirements can also be imposed, but they run the risk of reducing the program's cost-effectiveness. Sources that are allocated fewer allowances than the pollution load they expect to discharge in the course of the year must either purchase additional allowances from other sources or undertake pollution reduction activities. The aggregate pollution load across all sources thus cannot exceed the total number of allowances issued: it is "capped."

Credit programs differ in that sources "earn" marketable emission rights by over complying with existing regulations. For example, suppose that the BOD discharge standard is 100 ppm and that a particular source emits 100,000 tonnes of wastewater per year. This implies that the source can discharge up to 10 tonnes of BOD per year. If the source actually achieves a concentration of 70 ppm, then it earns a credit of 3 tonnes of BOD, which it can sell to sources that would otherwise be out compliance.

The U.S. has experimented with both types of programs. Early trading programs in the U.S. were all credit programs, but allowance programs have gained favor more recently. The reasons include greater ease of administration (the number of tradable rights is known in advance) and greater control over the total pollution load (although credit programs can provide similar control if the existing regulatory system is based on pollution

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[7] The Tax Analysis Division of the Ministry of Finance pointed out that international trade laws might place limits on the level of import duties implemented for environmental reasons. Violations of international laws are less likely, however, if excise duties on the same goods manufactured locally are set at the same level.

permits and not just discharge standards). For these reasons, our tentative recommendation for Malaysia is an allowance-trading program.

We recommend that the program focus on BOD, which is a serious problem in many river basins in Malaysia. According to the several issues of Environmental Quality Data in Malaysia BOD concentrations worsened in almost half of the rivers with complete readings. About two-fifths of these rivers were classified as "very" or "slightly" polluted; conditions deteriorated in nearly a quarter of the remaining, "clean" rivers. Domestic sewage and pig rearing are by far the most important sources of this problem. Among manufacturing industries, the leading source is food and beverages, which is dominated by SMIs. It accounted for 20 percent of the BOD load discharged by manufacturing industries. With the creation of *Indah Water Konsortium* (IWK), a major portion of the BOD load from all these source categories is now linked to identifiable private parties that could be required to participate in a trading program.

At a general level, the key steps in designing a BOD allowance-trading program would include the following:

1. Identify a river basin where the total BOD load significantly exceeds the estimated assimilative capacity of the receiving waters and where BOD sources are of various types and are easily identifiable. This could be one of the basins indicated above, or another one identified following further analysis.
2. Calculate current BOD loads from individual sources included in the program.
3. Decide on the target aggregate BOD load from those sources taken together (i.e., the "cap" This target should be based on the river's assimilative capacity.
4. Set the target number of years for reducing the current aggregate BOD load (from the calculations in step 2) to the target level determined in step 3. The amount should probably not be less than 10-20 years, to allow time for necessary investments in pollution reduction (whether cleaner technology or pollution control).
5. *Allocate BOD discharge allowances - where* 1 *allowance confers the right to discharge* 1 *tonne (or similar unit) of BOD per year - among the sources.* The easiest way to do this would be to allocate each source a number of allowances matching its current BOD load. As an alternative, SMIs could be favored by receiving slightly more allowances (say, an additional 25-50 percent above their current BOD load). These surpluses would need to be balanced by making slightly lower allocations to other sources. This arrangement would create an incentive for other sources to buy the surplus allowances from SMIs, thus providing a financial flow to SMIs. Alternatively, SMIs might prefer to save the surplus allowances to ensure that they will remain in compliance in future years even if they expand their operations.
6. *Determine the rate at which the allowance allocations will be reduced each year.* The easiest way would be to reduce each source's allocation proportionally, to achieve the aggregate BOD reduction implied by the amounts in steps 2 and 3 within the time period given in step 4. For example, if the aggregate reduction is equivalent to 40 percent of the current BOD load, and the time period is 10 years, every source's allocation would be reduced annually by an amount equaling 4 percent of its initial allocation. The rate of reduction could be less for SMIs, to give them more time to adjust and to provide a relative surplus of allowances that they could sell. The rate of reduction needs to be announced before the start of the program, so that sources can make pollution management decisions that are efficient in the long run.

Once the system is set up, a source should be entirely free to sell allowances as long as it has a surplus, i.e. as long as its allowance holdings exceed its BOD discharge. It should be entirely free to buy them as long as the BOD concentration in the portion of the river where it is located meets minimum quality standards (aimed at preventing "hot spots"). That is, sources should not need to obtain the approval of DOE or any other agency before trading.

This does not mean that there is no government role in the program. In fact, the success of the program depends critically on the government's ability to conduct several activities in a timely and reliable manner, i.e. by:

1. maintaining accounts that list each source's up-to-date allowance holdings and record trades,
2. monitoring each source's emissions (self-reporting is possible, but systems are needed to ensure that emissions are reported truthfully),
3. confirming that sources' emissions do not exceed their allowance holdings,
4. confirming that buyers are in locations where ambient concentrations do not exceed minimum quality standards, and
5. imposing penalties on sources whose BOD loads exceed their allowance holdings.

These activities and their institutional requirements are the program elements that must be considered most carefully during the design phase. Monitoring emissions and comparing emissions to allowance holdings might be done as infrequently as once a month, which is more frequent than the quarterly reporting under the Crude

Palm Oil Regulations but less frequent than the continuous emissions monitoring required under the SO_2 Allowance Trading Program. The resulting information should be made public.

Penalties for noncompliance should be stiff. For example, sources could be assessed a fine of 5 - 10 times the prevailing allowance price for the shortfall in the number of allowances they hold, and could have their next year's allowance allocation reduced by that number. Emissions trading is perhaps more reliant on effective enforcement than any other MBI.

From an institutional standpoint, emissions trading would be a bigger step in Malaysia than in some other countries in Asia. In China, for example, the government has long had a pollution permitting system, under which enterprises are expected to limit their pollution loads to amounts agreed upon with environmental authorities. Recently, China introduced a "Total Amount Control" system that places limits on aggregate pollution loads at the national and sub-national (provincial, county, etc.) levels. The combination of aggregate load limits and individual pollution permits means that China already has in place some of the key components of a trading program.

In Malaysia, in contrast, pollution regulation is based on discharge concentration standards, not pollution loads. With the exception of agro-based industries (palm oil and rubber mills), which as prescribed premises are required to report their BOD loads quarterly information on BOD loads from individual sources is extremely limited and calculated crudely. For example, BOD loads from sewage and pig farms are estimated by multiplying human and animal populations,[8] respectively, times assumed per capita and per animal BOD loads. In the case of sewage, some rough adjustments are made for the proportion of sewage that is treated. BOD loads from manufacturing industries are calculated by a variety of methods, none of them based on direct measurements (although some information from enforcement visits is reportedly used) or even on Malaysia-specific emission factors (which the DOE is just starting to develop).

An essential preliminary step for evaluating the feasibility of a pilot BOD trading program in Malaysia would therefore be to construct accurate BOD emissions inventories, based on sound statistical techniques, in 3 - 4 candidate river basins. This activity alone might take a year or more. It would generate information necessary for setting the initial emissions cap and allocating allowances to sources. It should be complemented by a parallel study on BOD concentrations at various points along the river, in particular points upstream and downstream of major point and non-point sources. In some cases, existing water quality monitoring stations might be sufficiently numerous to generate the needed information; in other cases, additional measurements might need to be taken. The emissions and monitoring data should then be used to develop an integrated model of the discharge and dispersion of BOD loads in the river basin. This model, which should be continually refined over time, would generate the information needed to determine the assimilative capacity of the river, set minimum quality standards at different points, and set the target BOD load to be achieved by the end of the program.

The candidate river basins should be ones that include a variety of sources and are heavily polluted. The existence of a variety of sources increases the probability that abatement costs will vary substantially across sources and, consequently, that the program will generate abatement cost savings. The Tar-Pamlico program in North Carolina includes, among point sources, municipal wastewater treatment plants, and, among nonpoint sources, crop and animal (pig) farms. River basins In Malaysia with a similar variety of sources include:

- Johor: Sg. Johor, Sg. Muar, Sg. Skudai.
- Melaka: Sg. Melaka
- Negeri Sembilan: Sg. Linggi
- Pulau Pinang: Sg. Jejawi, Sg. Juru, Sg. Prai
- Selangor: Sg. Langat, Sg. Selangor, Sg. Sepang.

SOCIAL IMPACTS OF RECOMMENDATIONS RELATED TO MBIs

Two examples of MBls are recommended in our paper: **presumptive charges** (a simplified deposit-refund system) and **emissions trading**. The presumptive charge scheme is considered most promising for controlling scheduled waste from textile industries, while the emissions trading scheme may be applied to reducing BOD from food processing as well as other non-SMI industrial and non-industrial sources.

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[8] From the Veterinary Department in the Ministry of Agriculture.

The social impact of these two MBIs will depend on how the programs are designed. Our proposal only discusses how the instruments will work in principle, while offering a hypothetical example of a presumptive charge program applied in the dyeing industry. However in general, the recommendations related to user fees for scheduled waste treatment will benefit SMIs by promoting treatment approaches that have scale economies and thus offer lower treatment costs. They will also keep costs down by discouraging monopoly pricing. By encouraging SMIs to relocate to industrial estates with appropriate treatment facilities, they will reduce exposure of the current neighbours of highly polluting SMIs to toxic and hazardous wastes.

Presumptive Charge

The proposed presumptive charge, or advanced disposal fee as it was described, is really just a change in the payment mechanism for scheduled waste management services, which law-abiding SMIs (and other companies) should already be purchasing. It will impose an increased burden only on SMIs that are currently not complying with the Scheduled Waste Regulations. For those that are already complying, it will simplify interactions with Kualiti Alam.

The nature of the proposed presumptive charge program suggests that due to the presumptive charge (i.e., tax on.dyes) firms that use toxic chemicals and discharge toxic wastes will pay a higher price on their input, and the tax revenue will go to the Government. The Government in turn pays the waste treatment facility (Kualiti Alam) a "refund" for collecting the scheduled waste from firms such as the dye houses.

Whether firms will prefer paying a presumptive charge or a collection fee directly to the waste treatment facility (as is the case currently, although few SMIs actually pay to have their waste collected) depends on the relative cost of the two schemes. However, since very few SMIs are currently treating their waste or paying to have it collected and treated by Kualiti Alam, the proposed presumptive charge program will invariably lead to an increase of the input cost across the board of all SMIs in those sectors. Since dyeing are very competitive industries, it may be rather difficult for SMIs to simply pass the cost increase to their customers, and therefore they will have to bear the burden themselves.

As a result of the presumptive charge, in the short run, the profit margin of these firms will likely shrink, and less competitive firms may be forced to shut down. In the long run, however, if the increase in input price induces cost cutting and technical innovation (including reducing the quantity of the toxic chemicals used or switching to less toxic chemicals so long as the program distinguishes the toxicity of the chemicals), then the presumptive tax program may hold the promise of not only being effective in reducing pollution but also conducive to the long-term development of SMIs.

Emissions Trading

The proposed emissions trading program promises to reduce the aggregate costs of reducing BOD emissions compared to CAC approaches. This will benefit SMIs and other participating companies. Moreover, it will impose a lower financial burden on participating companies than price-based MBIs like the palm oil effluent charges. Finally, the allowances can be allocated so that trading will generate a net flow of financial resources to SMIs.

Section 4.2 lays out key steps in designing an emissions trading program for BOD involving both SMIs and other sources. The social impact of such program on SMIs will depend on at least three factors:

1. how BOD discharge allowances are allocated;
2. how rapidly the allowance allocations will be reduced over time; and
3. the shape of SMIs' marginal abatement cost (MAC) curves and SMIs' MACs relative to those of other industrial and non-industrial sources.

If BOD discharge allowances are allocated to SMIs free of charge based on their current BOD load, the immediate financial impact of the tradable permits system on SMIs will likely be inconsequential. If more allowances are given to SMIs than their current BOD level, then SMIs will be better-off financially because they can keep the surplus allowances for future use or sell them to other sources. The higher the price of the allowance, the more financial benefit SMIs will reap.

However, emissions trading programs designed to give away allowances for free invariably favor existing sources and discriminate against new entrants to the market, since the existing sources have been assured the

right to pollute while new sources have to buy the right to pollute. For SMIs (as well as other sources), this means that the proposed emissions trading program will make it more difficult and costly to build new food processing factories (and other factories affected by this program), or to expand production by the existing SMIs if they are granted with surplus allowances.

If the rate at which the allowance allocations are reduced over time is rapid, then firms will be forced to reduce their BOD discharge rapidly. Or else they will have to purchase allowances to cover their unmet reductions. For SMIs as a group, another important factor may be how rapidly they can reduce their BOD discharge relative to non-SMI sources. The higher the relative rate of reduction, the more beneficial the program will be for SMIs.

Finally, the impact of emissions trading on SMIs hinges upon their marginal costs of abating BOD discharge. If the shape of SMIs' MAC curves is steep, then expansion of production by SMIs will be relatively difficult, because they will have to either spend more money on their own pollution control or buy pollution allowances from the market. A related factor is the relative MAC between SMIs and other sources. If SMIs' MAC is lower than that of other sources, the emissions trading program will benefit SMIs relatively more than if their MAC is higher than that of other sources. In any event, the proposed emissions trading program will conceivably have little adverse impact on SMIs, and if designed favorably, it may even benefit the existing SMIs.

CONCLUSION

This paper has made a distinction between market-based instruments (MBIs) and fiscal/financial incentives, with the former being defined as a stick (emissions charge) and the latter a carrot (subsidies for pollution control). As such, MBIs are linked to pollution discharge, while fiscal/financial incentives mainly target environmental investment.

With this distinction in mind, generally speaking, fiscal/financial incentives are beneficial to SMIs, while MBIs impose a cost on SMIs to conduct business (as well as an incentive to control pollution).

These two sets of incentives/instruments are interrelated, however. Fiscal and financial incentives for SMIs are plentiful, including those for pollution control, yet a few SMIs have taken advantage of them. The reason is that despite the availability of the carrot, it is not attractive enough by itself, given that there is little stick being applied.

In this paper we propose piloting presumptive charges and emissions trading that are relevant to the industrial pollution problems. We favor presumptive charges over charges directly on pollution discharged by SMIs for two reasons. First, pollution charges require relatively accurate monitoring of pollution loads. While this was fairly straightforward in the case of crude palm oil mills, it would be much more difficult in the case of scattered and diverse SMIs discharging individually small amounts of pollutants. Moreover, in contrast to BOD, some of the more important pollutants discharged by SMIs (e.g., dyes in the textiles industry) require more sophisticated laboratory procedures for determining concentration levels accurately. The second reason is that the risk of "hot spots" might be unacceptable when pollution charges are applied to especially toxic or hazardous substances. Although this risk could in theory be managed by using a charge *cum* standard approach as in the case of the palm oil effluent charges, this would again require more accurate monitoring than is likely to be possible.

The version of the presumptive charge that we have described is equivalent to a deposit-refund scheme, but it is likely to be easier to administer. It also ties in more directly to the scheduled waste management system that the Government has designed, with Kualiti Alam as its centerpiece. It is especially promising for the textiles industry, which is an important source of scheduled waste.

The emissions trading proposal pertains to BOD, which is the principal pollution problem associated with the food processing industry. It is attractive because there are many sources of BOD in addition to food processing. Hence, marginal costs of abatement are likely to vary considerably. The time seems ripe in Malaysia for determining the feasibility of a system of tradeable discharge permits as a least cost option to meet preset environmental standards in, e.g., watercourses". BOD seems to be the best candidate for an emissions trading system in the case of water pollution. Although it expresses some skepticism about the need for trading given how successful the charge *cum* standard approach has been in the case of palm oil mills, this skepticism is justified only if the trading program is limited to that single industry. Our proposal is for a program that would include multiple industries, and in fact non-industrial as well as industrial sources, to take advantage of differences in marginal costs. One of the most appealing traits of such a program is that it could be structured to direct financial flows toward SMIs.

REFERENCES

Jeffrey R. Vincent, Rozali bin Mohamed Ali, and Associates, (1997). *Environment and Development in a Resource-Rich Economy: Malaysia under the New Economic Policy*, Harvard University Press for HIID, 1997.

Khalid Abdul Rahim (1991). Internalisation of Externalities: Who Bears the Cost of Pollution Control? *The Environmentalist*, Vol. 11, No. 1, 19-25.

Khalid Abdul Rahim (1993). "The Economics of Pollution Control: Does Malaysia Need Regulatory Reform?" in *Contributions to Training in Environmental Economics in the Asia-Pacific Region, NETTLAP Publication*, John E. Hay and Basil M.H. Sharp (eds.) No. 6, November, p. 135-172. United Nations Environment Programme.

Khalid Abdul Rahim (1994a). "Tradeable Discharge Permits: A Cost-effective Instrument in Pollution Control". *Malaysian Journal of Agricultural Economics*, Vol. 11, 43-63.

Khalid Abdul Rahim (1994b). The Standard-cum-Charge Approach in Environmental Policy: The Malaysian Experience in *Applying Economic Instruments to Environmental Policies in OECD and Dynamic Non-Member Economies*, David O'Connor (ed.) ISBN 92-64-14212-6, OECD, Paris, p. 59-82.

Khalid Abdul Rahim (1994c). "Recent Developments in the Use of Economic Instruments in Environmental Policies". *Asian Journal of Environmental Management*, Vol 2, No. 2, 127-132.

Khalid Abdul Rahim (1996). "Why Pollution Standards are Preferred by Industries: Pragmatism and Rent-seeking Behaviour". *The Environmentalist*, **16**:49-53.

Khalid Abdul Rahim (1997). "Water Pollution Control" in *Environment and Development in a Resource-Rich Economy: Malaysia under the New Economic Policy*, Vincent and Rozali, aus; Chapter 10, p. 319-349. HIID/Harvard University Press.

Khalid Abdul Rahim and John B. Braden (1993). Welfare Effects of Environmental Regulation in an Open Economy: Malaysian Palm Oil, *Journal of Agricultural Economics*, Vol. 44, No. 1, 25-37.

Malaysia: Eighth Malaysia Plan 2001-2005, Kuala Lumpur.

Malaysia: National Economic Recovery Plan (1998), Kuala Lumpur.

Malaysia: Seventh Malaysia Plan 1995-2000, Kuala Lumpur.

Stein Hansen and Goh Kiam Seng (1997), "A study of economic instruments for environmental policy in Malaysia", a report prepared for MOSTE, funded by UNDP, (August, 1997).

Appendix

THE SUNGAI JOHOR SIMULATION

This section is extracted from Khalid (1993, 1994a, 1997). The results of this study have been used in the two documents mentioned in the paper.

The Sungai Johor river basin has 16 crude palm oil mills in operation, of which 10 discharge effluents into the river. The remaining six discharge palm oil mill effluents onto land. All 10 mills used similar ponding system to treat their effluents before discharging them into the river. The river receives the largest aggregate BOD load, by virtue of having the largest number of mills in the country. The ten mills in aggregate produced an average of 205,713 tonnes of effluents per quarter in 1991.

Data Requirement

Information required for the study are obtained from the mills' annual license applications and quarterly returns submitted to the DOE for 1978-91. However, we used the 1984-91 data for our analysis, when the standard was the same in each year and when effluent treatment technology was well established. With differing numbers of observations for each mill because of differences in age, a total of 172 quarterly observations are obtained for the period.

Variables in the Model

We defined quarterly BOD abatement as the difference between the BOD load for untreated effluent and the actual treated BOD load. This is obtained by multiplying the weight of effluents produced (in tonnes) with the difference between 25,000 ppm (i.e. the mean concentration of BOD in untreated effluent) and the actual concentration.

The marginal costs of abatement is obtained directly from the effluent charges where one would expect a mill with rational behaviour to choose the BOD concentration when the cost of abating the last unit of BOD equals the effluent charge the mill would be required to pay. The nature of the data on effluent charges complicates estimation of the marginal cost curve. First, when a mill's BOD concentration exactly equals the standard, its marginal cost of abatement does not necessarily equal the basic charge. It may range from as low as RM10 per tonne to as high as RM100 per tonne of BOD. However, this problem is dealt with by defining the data into two sets: the full and the partial data sets. The full data set includes all the data while the partial set includes only data for which we are 95% confident that the charge equals the marginal cost of abatement, i.e. when the mills do better than the standard. Secondly, the charges do not vary over time, but this problem is overcome since there is substantial variation in the data for charges as the basic and excess charges differ from RM10 to RM100 per tonne. In addition, the real value of the charges can be determined by deflating them with 1978 as the base year.

Capacity utilisation, i.e. the ratio of crude palm oil output to processing capacity, is an additional variable used to explain the shift in the marginal cost of abatement due to unusually large amounts of effluents generated as a result of bumper harvests.

Method of Estimation

The expression on the marginal cost of abatement is estimated using the ordinary least squares (OLS) method and tested for heteroscedasticity and for no correlation in the error components with the explanatory variables. These are carried out by Breusch-Pagan and Hausman tests respectively.

      Three versions of the estimates are evaluated:
1) The Ordinary OLS estimates - These are total effect estimates with the intercept constrained to be the same across mills.
2) The Fixed Effects (FE) estimates - These are OLS estimates with the intercepts allowed to vary across mills.
3) The Random Effects (RE) estimates - These are estimates in which we assume that there is a common mean intercept, but actual intercepts vary randomly (error components).

The Empirical Estimate

Assuming that the quarterly total variable cost of operating a treatment system is of a Cobb-Douglas form we derived a log-linear function for the marginal cost of abatement which is more conveniently estimated. The derivation of the marginal cost of abatement function of our simulation model is presented in the Appendix. The estimating equation is of the form:

$$\ln(MCA_t) = \alpha_i + \beta\ln(ABATE_{it}) + \gamma\ln(CAP_{it}) + \varepsilon_{it}$$

where

MCA is the marginal cost of abatement, which is equal to the charge;
ABATE, the level of abatement; and
CAP, the capacity utilisation ratio.

ε is an error term, which is assumed to be independently and identically distributed (i.i.d.) across mills and time periods.

The estimates of the parameters are given in Table 1. As expected β is positive indicating that the marginal cost of abatement rises with the level of abatement, but it is inelastic: the marginal cost of abatement rises by less than one percent given a one percent increase in the abatement level. Similarly, γ is also positive and less than one.

There is no evidence of heteroscedasticity in our estimation with this specification of the model, and according to the F test for fixed effects we failed to reject the hypothesis that the intercepts are identical. This is reassuring as the treatment technologies are similar among mills. According to the Hausman test we also failed to reject the hypothesis that the error components are uncorrelated with the explanatory variables. Thus, the random effects model is preferred over the fixed effects model. The results for each model do not differ relatively between samples in the full and partial data sets. Since the full data set sample includes more data as well as data on all mills, we prefer the estimates based on the full data set sample. Indeed the effluent charges equal the marginal cost of abatement not only for samples in the partial data set but also in the full data set.

Results of Simulation

Using the random effects model with full data set we simulate the aggregate costs of abatement for an average quarter in 1991 under four policy options: standards, effluent charge, standards-cum-charge, and TDPs that achieve identical reductions in the aggregate BOD load. The results are presented in tables 2 through 5. The aggregate resource costs of abatement are represented by the sum of areas under the marginal costs of abatement, *ceteris* <u>paribus</u>. The total cost to the industry in the river basin is the sum of aggregate abatement resource costs and effluent fees. The aggregate BOD load is the total effluent generated by the 10 mills, which for an average quarter in 1991 is 205,713 tonnes, multiplied by the BOD concentration. The aggregate BOD load is essentially the amount of permits (in tonnes) that would be issued to achieve a desired level of water quality.

Policy Implications

Given the policy options, it is clear that the least-cost option to the industry is the TDPs. Revenues from the sale of excess permits for low-cost abaters are exactly offset by the additional cost of permits for high-cost abaters, making them a zero-sum. Thus, the total cost to the industry is represented only by the costs of abatement.

In terms of efficiency in effluent abatement, TDP option is identical to the pure effluent charge, except that the latter involves the payment of effluent fees which constitutes an additional cost to the industry (Table 6). These two options are more efficient in effluent abatement compared to the standards and standards-cum-charge options, which are in themselves identical.

In terms of total cost to the industry, the standards option is preferred over anything that involves effluent charges (i.e. the pure effluent charge and standards-cum-charge) but is less preferred than the TDP option. Thus, we are able to rank the TDP as superior to the other three options in terms both of efficiency in effluent abatement and the total cost to the industry.

The divergences in abatement resource costs and in the total cost to the industry between the four policy options are more evident, in absolute and in relative terms, at low levels of pollution standards. Thus, the scope for variation in abatement levels, hence abatement cost savings, is greater at less stringent standards. At low levels

of abatement, say in achieving 5000 ppm BOD concentration, the TDP scheme generates a cost saving of RM 9,485 per quarter or 14.13% of the costs of abatement compared to the uniform standards approach. The TDP scheme would save the industry some RM 16,184 to RM 29,775 per quarter or 21.92% to 34.06% of the costs of abatement when compared to the existing policy of standards-cum-charge.   At higher levels of abatement the cost savings from TDP option are small relative to the total cost of abatement. The TDP generates a cost saving over the standards option of some RM 1,248 per year (RM 312 per quarter) or 0.34% of the cost of abatement to the industry with the highest level of abatement. Compared to the existing policy of standards-cum-charge the TDP would save the industry some RM 462 to RM 522 per quarter or 0.50% - 0.57%. These savings may not be significant given that transaction and administrative costs were not considered in the analysis.

Table 1: Parameter Estimates of the Marginal Cost of Abatement

	Full Data Set			Partial Data Set		
	OLS	FE	RE	OLS	FE	RE
β	0.488*** (0.092)[1]	0.316 (0.211)	0.427*** (0.150)	0.571*** (0.116)	0.295 (0.196)	0.413** (0.159)
γ	0.694*** (0.128)	0.412** (0.168)	0.487*** (0.149)	0.844*** (0.131)	0.276 (0.178)	0.388** (0.157)

** significant at 0.05 level,
*** significant at 0.01 level,
1. figures in parentheses are standard errors.

Table 2: Costs of Abatement for Uniform Standards, Sungai Johor

Standard (ppm)	5000	1000	500	100
Aggregate Abatement Resource Costs (RM)	67,117	87,065	89,666	91,763
Minimum Marginal Cost (RM)	6.51	7.03	7.10	7.15
Maximum Marginal Cost (RM)	37.62	40.67	41.03	41.31
Aggregate BOD Load (tonnes)	1029	206	103	21

Table 3: Costs of Abatement Under Effluent Charge, Sungai Johor

Aggregate BOD Load (tonnes)	1029	206	103	21
Effluent Charge (RM)	29.03	37.57	39.00	40.15
Aggregate Abatement Resource Costs (RM)	57,632	84,250	88,184	91,451
Aggregate Effluent Fees (RM)	29,848	7,735	4,022	824
Total Cost to Mills (RM)	87,480	91,985	92,206	92,275
Minimum Concentration (ppm)	0	0	0	0
Maximum Concentration (ppm)	14,098	5,064	3,243	1,711

Table 4: Costs of Abatement With Standards-cum-Charge, Sungai Johor

Standard (ppm)	5000	1000	500	100
Aggregate BOD Load (tonnes)	1029	206	103	21
Aggregate Abatement Resource Costs (RM)	67,117	87,065	89,666	91,763
Basic Effluent Fees (RM) @ RM 10.00 (Upper Limit)	10,290	2,060	1,030	210
Basic Effluent Fees (RM) @ Min. Marginal Cost	6,699	1,448	731	150
Total Cost to Mills (RM)	73,816 to 77,407	88,513 to 89,125	90,397 to 90,696	91,913 to 91,973
Minimum Marginal Cost (RM)	6.51	7.03	7.10	7.15
Maximum Marginal Cost (RM)	37.62	40.67	41.03	41.31

Table 5: Costs of Abatement With Tradeable Discharge Permits, Sungai Johor

Aggregate BOD Load (tonnes) Permitted	1029	206	103	21
Aggregate Abatement Resource Costs (RM)	57,632	84,250	88,184	91,451
Total Cost to Mills (RM)	57,632	84,250	88,184	91,451
Minimum Concentration (ppm)	0	0	0	0
Maximum Concentration (ppm)	14,098	5,064	3,243	1,711
Tradeable Permit Price (RM)	29.03	37.57	39.00	40.15

Table 6: Comparative Costs of Environmental Policy, Sungai Johor

POLICY OPTION	ABATEMENT RESOURCE COST (RM)	EFFLUENT FEES (RM)	TOTAL COST (RM)
Standard	91,763	-	91,763
Effluent Charge	91,451	824	92,275
Standard-cum-Charge	91,763	150 to 210	91,913 to 91,973
Tradeable Discharge Permits	91,451	-	91,451

Green Marketing:
A Study of Environmental Knowledge and Attitudes of University Undergraduates

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ABSTRACT
Environmental concern becomes a national issue with the launch of "Earth Day" on April 22 1970. After increasing in media and press attention, consumers have focused their concern on issues like air and water pollution, depletion of ozone layer, deforestation, and other environmental issues. The paper explains about green marketing consciousness among undergraduates' consumers and seeks to examine its impact on their buying behavior. A survey was conducted among two hundred undergraduate students of Universiti Utara Malaysia, to assess their environmental awareness as the consumers. Generally, the findings show that the respondents have a favorable response to the environmental concern. Furthermore, the results also indicate that both knowledge and attitude have significant relationship with consumer green purchasing behavior.

INTRODUCTION

Environmental concern becomes a national issue with the launch of "Earth Day" on April 22nd 1970. After increasing in media and press attention, public has focused their concern on issues like air and water pollution, depletion of ozone layer, deforestation, and other environmental issues. There were various studies and research on environmentalism has been immense (Grunert and Grunert 1993; Ottman, 1993; Chan, 1996; Follows and Jobber, 2000). One of the most often discussed is the impact of the environment due to consumption. Beside that, majority of these studies also have discussed and found demographic variables and behavioral indicators of environmental commitment (Zimmer et al., 1994).

Generally, the environmental concern is an attitude toward substantive issues limits the construct to awareness and knowledge of specific environmental problems, especially those promoted in the media. Study by Dunlap and Van Leire, (1984) environmentalism embraces the belief that humanity and the biophysical environment are interdependent. In other words, it is the belief of an individual about the importance of the environment to himself. This includes the personal relevance, interest and concern on environment issues, and feelings of connectedness with environment. Beside that is also influence the behavior of individual, for instance product choice and purchase.

Consumer environmental awareness has increased, and some consumers have translated their resulting environmental concern into actively purchasing green products (Smith,1990). According to Ottman (1993), environmentally conscious consumers are those who actively seek out products perceived as having relatively minimal impact on the environment and are assumingly educated, affluent, and who represent the most desirable of consumer target markets.

Meanwhile, companies have come forward to respond to the growing environmental concern of consumers with the introduction of variety of green products (Kangun et al., 1991). Promotion of these green products attempts to influence green consumer behavior and stimulate green product purchases. However, marketers need to give more attention to environmental issues related with their marketing strategies, particularly to products that they sell. They need to improve their products and marketing strategies towards going green marketing. To access this changing trend, it is the purpose of thus study to evaluate the level of knowledge and attitude of consumers towards green products purchase behavior.

OBJECTIVES OF THE STUDY

This study is an exploratory study which aims to achieve the following objectives:
i)   To examine consumers' knowledge about green products.
ii)   To examine consumers' attitude towards the effects of green products on the environment
iii)   To investigate the relationship between knowledge and attitudes with green purchase behavior.

LITERATURE REVIEW

Green or environmental concern values are becoming important as they relate to specific consumer behaviors. Since last two decades, environmental concerns become important issues and become an area of various researches especially for the social sciences. Over the years, a majority of consumers have realized that their purchasing behavior had a direct impact on many ecological problems. These environmentally aware consumers called as 'green consumers' go after products that designed to protect the environment called which called as 'green products' (Verma and Kaur, 2000). This green product is one that meets consumers' needs, socially acceptable and is produced in a sustainable manner. Therefore, a product can be 'green' when its environmental and societal performance, in production, use and disposal, significantly improved and improving in comparison to conventional or competitive product offerings (Peattie, 1995). It also includes products that claim such as reduction of the actual or potential harm they cause to society or the environment. A variety of green products are now offered to consumers, ranging from laundry detergents and household cleaning products to cosmetics and toiletries, and from energy saving appliances to compostable nappies (in the USA). Meanwhile, Hopfenbeck (1992), mentioned that there is a wide range of green products in the market that are currently available to the consumers. The products include organic (bio) food, batteries without mercury, disposable nappies, unleaded petrol, phosphate free and biodegradable detergents, ozone friendly aerosols, recyclable products and biodegradable plastic bags. Generally, environmental issues and concerns address usage of claims such as "environmental friendly", "ecologically safe" or any similar terms intended to convey in a general way of idea that the product is not harmful or is beneficial to the environment.

Various studies has been undertaken with the intention to understand and how its influence personal and social behavior (Synodinos, 1990; Chan, 1999; Van Dam, 1991). Beside that, increased academic investigation on green issues has mirrored the evolution of environmental sensitivity in the general populaces (Straughan and Roberts, 1999). They supported that this initial efforts of 20-35 years ago introduced the topic as appropriate for further exploration. These studies also suggest that consumers are willing to change their consumption behavior in order to preserve the environment. Adopting use of recycled material is a good indicator of green behavior. Consumers who give more attention and concern about ecological and environmental issues would switch and use environmentally friendly brands (Du Preez, Diamantopoulos and Schlegelmilch, 1994).

Beside that, consumers are also realizing the importance of natural environment as part of their daily life, particularly so in consumption patterns and behavior. They prefer to choose products that are environmentally friendly and this perception and attitude form more environmentally purchasing behavior among the consumers (Du Preez, Diamantopoulos and Schlegelmilch, 1994) . This indicates that, there has been increasing concern for environmental well being and purchasing behavior by consumers. Chan (1996) stated that concern for environmental issues represent predispositions of human beings influencing behavior in a favorable or unfavorable manner. It is being supported by the information processing theory, which contains assumptions about how consumers respond to information provided by various sources (example: information about the environment), and then use the information in a specific choice situation (example: consumer purchase behavior) (Bettman, 1979). This theory can explain the relationship between an individual's level of concern for environmental issues and consumer purchase preferences. These environmental concerns directly relate with the term and concept of recyclable and reuse of materials of the products purchased by the customers. Carter and Carter (1998) concluded that environmental purchasing functions are involved in activities that include reduction, recycling, reuse and substitution of materials. According to Biswas, Licata, et.al.(2000), attitude towards recycling has a significant effect on waste recycling and recycling shopping behavior. Furthermore, findings by Mobley and colleagues (1996), indicate that behavior towards recycled products are not only based on product use but by overall effect that could be the foundation for attitudes. In another study, an individual's attitude was found to be a significant indicator in purchasing recycled or recyclable products (Minton and Ross, 1997).

As well as investigating the environmental attitude-behaviour relationship, researchers have also studied the relationship between attitudes towards the environment and environmentally sensitive behaviour. Study by Seligman et al. (1979) and Londbury and Tournatzky (1977) observed that a strong specific environmental attitude-behaviour link did exist. Beside that , Synodinos, 1990) stated that "more positive attitudes may result by increasing knowledge about environmental issues. Meanwhile study by Davies (1993) found that advertisements which aim to develop consumer knowledge of a product's environmental performance, have also been shown to build positive attitudes towards that products that being advertised.

In summary, individual and social concerns over environmental issues have become increasingly apparent now days. This concerns has resulted in an expanded issues that related within the studies on environmental aspects. With increased environmental awareness and concerns, individual and consumers have moved beyond simply addressing pollution and waste disposal to looking for alternative consumption patterns to keep in-step with the

environmental movement. Green movement and concerns are primarily consumer driven. If consumers have a positive attitude towards environmental issues and channel them into proper environmentally conscious purchasing behavior, it is likely that profit-driven firms will be strongly motivated to apply the concept of green marketing to their operations (Chan, 1999).

METHODOLOGY

A survey was conducted among undergraduate students of Universiti Utara Malaysia, to assess their environmental knowledge and attitudes as the consumers. Two hundred graduates were selected for this study. Data for this research was collected through self-administered questionnaire. A questionnaire be developed based upon reliable questions tested and used by past researchers (Martin, and Simintiras,1995; Chan 1996). In addition, other questions deemed important and reasonable have been added. The survey questionnaire divided into four sections. Respondents were asked to answers questionnaires about measurement of knowledge, attitudes, purchase behavior and personal bio data.

Reliability Assessment

Cronbach's alpha coefficients were calculated in order to check the internal consistency and reliability of each factor. For this study, the acceptable reliability coefficient or alpha was based on Nunnaly's (1978) standard that was 0.7 and above. Table 1 shows the results of reliability test using Cronbach's alpha coefficients to measure of consistency and stability of the constructs for "knowledge", " attitudes" , and "purchase behavior" were 0.79, 0.84, and 0.80 respectively, indicating high internal consistency and reliability.

Table 1: Reliability Coefficients of the Scale

Scale	N. of Items	Cronbach Alpha
Knowledge	8	.79
Attitudes	6	.84
Purchase Behavior	8	.80

FINDINGS

The demographic profile of the respondents is summarized below followed by an outline of environmental knowledge and attitudes of consumers in relation to its impact on purchase behavior. The results of correlation are also presented in this section.

Demographic Profile of Respondents

Table 2 shows the profile of respondents. The respondents' ages ranged from 19 years of age to over 24 years. Of the 200 respondents, 55 per cent were male and another 45 percent were female. Years in study of respondents varied from 37 percent were in third years, 25 per cent were in second years, 23.5 per cent in first year and 14.5 per cent reported as fourth year. As for ethnic background, about 55 per cent of respondents were Malays, 24 percent of Chinese, 16.5 per cent Indians and 4.5 per cent comprised other races.

Table 2: Profile of Respondents

Characteristic	n	%
Age		
Below and 19 years	37	18.5
20-23 years	139	69.5
24 and above	24	12.0
Gender		
Male	110	55
Female	90	45
Years in study		
First years	74	37
Second years	50	25
Third years	47	23.5
Fourth years	29	14.5
Ethnic Groups		
Malay	110	55
Chinese	48	24
Indian	33	16.5
Others	9	4.5

Green Marketing Knowledge and Attitudes

Table 3 shows the environmental knowledge of the respondents based on the eight statements. The table indicates that environmental knowledge statements, namely " Recycled paper products", "Products in recycled packaging" and " Ozone friendly aerosols" received the top three positions with mean which are 4.32, 4.12, and 4.05 respectively. As for less environmental knowledge statements, "Energy saving appliances" and "Biodegradable products" occupied the lowest rankings with mean values 2.69 and 2.55 respectively.

Table 3: Statements Regarding Green Products Knowledge

No.	Statements	Mean
1	Recycled paper products	4.32
2	Products not tested on animals	3.49
3	Ozone friendly aerosols	4.05
4	Products in recycled packaging	4.12
5	Unleaded petrol	3.95
6	Energy saving appliances	2.69
7	Green laundry detergents	3.01
8	Biodegradable products	2.55

Note: A 5 point Likert scale was used, with 5 being know great deal about and 1 being know nothing about.

The extent of attitudes for green marketing was also solicited from the respondents. They were asked to respond to six statements relating to their attitudes. Statements 9-14 refer to the attitudes of the respondents towards environmental, that is their belief that individuals can positively influence the outcome to environmental concern. Table 4 shows that a mean response more than 3 indicates a favorable attitudes response, while mean response less than 3, indicates unfavorable attitudes response. Generally, Table 4 indicates that respondents have favorable attitudes toward environmental concern.

Table 4: Statements Regarding Environmental Attitudes

No.	Statements	Mean
9	I always concern about environmental issues	4.04
10	I will use products that do not affect the environment	3.59
11	I'm willing to spend money to buy recycled products	3.93
12	Green products are good for me	3.25
13	It make difference what I do to prevent pollution	4.16
14	When I buy products, I try to consider how my use of them will affect the environment on other consumers	3.21

Green Purchase Behavior

Table 5 shows the mean value for the purchase behavior statement. The mean values in the questionnaire varied form minimum 1 (strongly not agree) to a maximum '5' (strongly agree). Respondents were asked to respond to eight statements relating to important environmental purchase behavior. Statements 15 to 21 indicate that, generally respondents have favorable respond to purchase green products. The top three purchase behavior statements of green products are " Purchase of rechargeable batteries", "Purchaser of beverages in disposable containers" and " Purchase of shampoos in reusable containers" with mean values of 4.21, 4.03 and 3.96 respectively. The other purchase behavior statements showed mean values ranging from 3.12 to 3.65

Table 5: Green Purchase Behavior Statements

No.	Statements	Mean
15	Purchases of products that do not affect environment	3.50
16	Purchases of products which are biodegradable	3.12
17	Purchase of rechargeable batteries	4.21
18	Purchase of stationery items which are recyclable	3.72
19	Purchase of beverages in disposable containers	4.03
19	Purchase of shampoos in reusable containers	3.96
20	Purchase ozone friendly aerosol sprays	3.64
21	Purchase of unleaded petrol	3.65

Note: A 5 point Likert scale was used, with 5 being strongly agree and 1 being strongly disagree.

Relationship between Knowledge and Attitudes with Purchase Behavior

Pearson correlations matrices of environmental knowledge and attitude with purchase behavior were presented in Table 6. Coefficient with two-tailed was used. Significant level is at 0.01. Correlation analysis showed that there were significant and positive relationship between knowledge (0.471) and attitudes (0.411) of respondents with purchase behavior of green marketing products.

Table 6: Correlation Coefficients of Study Variable

	Purchase behavior
Knowledge	.471**
Attitudes	.411** .

** Correlation is significant at the 0.01 level (2 tailed)

DISCUSSION

This paper explores respondents' knowledge and attitudes towards green marketing purchase behavior. The findings of the survey indicate that university undergrads have positive knowledge about environmental issues and green marketing products. Respondents have great deal of knowledge about recycled aspects compare to other environmental concern issues. This is inline to government's popular slogan in environmental campaign. However, the respondents have less knowledge about energy saving appliances and biodegradable product, which required more campaign and promotion about other eco-friendly products. Generally, the findings show that respondents were aware about environmental green products.

Meanwhile, in term of attitudes, respondents have a positive attitudes towards environmental. They belief that their contribution is important towards environmental concern. The two top eco–friendly purchase behavior among the respondents are related to rechargeable batteries and beverages in disposable containers, which is the highest rate of purchasing among the green products. In other words, this study has illustrated that consumers' environmental concern may impact on their purchasing behavior.

Thus, organizations planning to increase market penetration for existing green product offering would be recommended to develop campaigns directed to increasing concern among consumers about environmental aspects. Marketers also can take advantage of opportunities to work with retailers by developing and innovating alternative products that can reduce waste and attract affluent green consumers. For example, make products more durable, design products for remanufacturing, recycling and repair, products safe for disposal (especially detergent), and products with energy efficient. Beside that, they also should pay particular attention to the design and development of the environmental packaging and advertising claims in order to competitive in term of green product and corporate image. Undoubtedly, there is a lot of scope for marketers to exploit the market of green consumers.

Public policy-makers should consider various ways about when and how to provide additional education to consumers and at the same time provide incentives to marketers for greater use of more 'green' raw materials. Government agencies should further strengthen its environmental educations and campaigns to better equip consumers about eco-friendly purchasing behavior. Meanwhile, tax instruments should also be used to deter the use of products that pollute the environment. For example, a surcharge should be imposed on products that are detrimental to the ecosystem and taxes collected could be channeled towards funding expenditure that preserves the natural world.

The study demonstrated the relevance of knowledge and attitudes in relation to green purchase behavior but its preliminary nature needs to be emphasized. This issues needs to be further examined by uses of a larger sample to re-ascertain the significance of variables included in the study. Further research also should be carried out on determining factors that contribute to eco-friendly purchase behavior and on a business enterprise's strategies and attitudes towards producing environmentally green products.

CONCLUSION

This study has been exploratory in nature. The limitations in the sample size suggest that only tentative conclusions should be made for the present study. The study has revealed that the present day university undergraduates are enlightened towards the environmental problems. The favorable environmental concerns can be transformed by marketers into a positive purchase behavior for green products. In other words, there is enormous opportunity for the marketers to develop and sell environmental-friendly products. Although this study give some useful insights but more in-depth follow-up investigation is considered necessary to further understanding of students' knowledge and attitudes towards green product purchasing behavior.

REFERENCES

Bettman, J. R. (1979). A*n information processing theory of consumer choice.* MA: Addison-Wesley Company.

Biswas, A., Licata, J., McKee, D., Pullig, C. and Daughtridge, C. (2000).The recycling cycle : An empirical examination of consumer waste recycling and recycling and recycling shopping behaviors. *Journal Of Public Policy and Marketing*, *19*(1), 93-105.

Carter, C.R. and Carter, J. R. (1998). Interorganizational determinants of environmental Purchasing: Initial evidence from the consumer products industries. *Decision Sciences*, *29*(3), 659-684.

Chan, R. Y. K. (1999). Environmental attitudes and behavior of consumers in China: Survey findings and implications. *Journal of International Consumer Marketing*, *11*(4), 25-49.

Chan, T. S. (1996). Concerns of environmental issues and consumer purchase preferences: A two-country study. *Journal of International Consumer Marketing*, *9*(1),43-55

Davies, J.J. ((1993). Strategies for environmental advertising. *Journal of Consumer Marketing*, *10*(2), 19-36.

Du Perez, J. P., Diamontopoulos, A. and Schlegelmilch, B. (1994). Several product standardization and attributes saliency: A three-country empirical comparison. *Journal of International Marketing*, *2* (1), 7-28.

Dunlap, R.E. and van Leire, K.D. (1984). Commitment to the dominant social paradigm and concern for environmental quality. *Social Science Quartley*, 65(4),1013-1028.

Follows. S.B and Jobber, D. (2000). Environmentally responsible purchase behavior: a test of a consumer model. *European Journal of Marketing,34(5/6)*,723-746.

Grunert, S. C. and Grunert K. G. (1993). What's green about green consumers besides their environmental concern?. *Proceedings of the 22ⁿᵈ Annual Conference of the European Marketing Academy*, 2, Barcelona, May, 1611-1613.

Hopfenbeck, W. (1992). The green management revolution: Lessons in environment excellence. United Kingdom: Prentice Hall.

Kangun, N., Carlson, L. and Grove S.J. (1991). Environmental advertising claims: a preliminary investigation. *Journal of Public Policy & Marketing, 10*(2) , 47-58.

Loundbury, J.W. and Tournatsky, L.G (1977).A scale for assessing attitudes toward environmental quality. *Journal of Social Psychology*, *101*,299-305.

Martin, B. and Simintiras, A. C. (1995). The impact of green product lines on the environment: Does what they know affect how they feel? *Marketing Intelligence and Planning, 13*(4), 16-23.

Minton, A.P. and Ross, R. L. (1997). The effects of environment concern on environmentally friendly consumer behavior : An exploratory study. *Journal of Business Research, 40*(1), 37-48.

Mobley, A. S., Todds, S.P., Eric, M.U. and Rao, H. U. (1995). Consumer evaluation of recycled products. *Psychology and Marketing*, *12*(5), 165-76.

Nunnaly, J.C. (1978). *Psychometric theory*. New York:McGraw Hill.

Ottman, J. (1993). *Green marketing : Challenges and opportunities for the new marketing age.* Chicago: NTC Business Book.

Ottman, J. (1993). Industry's response to green consumerism. *Journal of Business Strategy*, *13*, 3-7.

Peattie, K. (1992). *Green marketing*. London: Pitman Publishing.

Porter, M. E. and Van der Linde, C. (1995). Green and competitive: Ending the Stalemate. *Harvard Business Review*, *73*, 120-134

Seligman, C.M., Kriss, M., Darley, J.M., Fazio, R.H., Becker L.J and Pryor, J.B (1979). Predicting summer energy consumption from householders' attitudes. *Journal of Applied Psychology*, *1*, 70-90.

Smith (1990). How green is my valley. *Marketing and Research Today*, *18*(2), June, 76-82.

Straughan, R.D. and Roberts, J.A. (1999). Environmental segmentation alternatives: A look at green consumer behavior in the millennium. *Journal of consumer Marketing*, *16*(6), 558-576.

Synodinos, N.E. (1990). Environmental attitudes and knowledge: A comparison of marketing and business students with other groups. *Journal of Business Research*, *2*, 161-170.

Van Dam, Y.K. (1991). A conceptual model of environmentally conscious consumer behaviour. *Marketing Thought Around the World, Proceedings of the 20ᵗʰ European Marketing Academy Conference*, *2*, 463-83.

Verma, D.P.S and Kaur, G. (2000) . Green marketing : A study of environmental concern among Delhi University post-graduates. *NMIMS Management Review*, *12*(2), 1-16.

Zimmer, M.R., at al., (1994). Green issues dimensions of environmental concern. *Journal of Business Research*, *30*(1), 63-74.

An Analysis Of Sarawak's Manufacturing Productivity

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ABSTRACT

This research paper is an empirical study on the productivity of Sarawak's Manufacturing Sector.   The Manufacturing Sector contributes significantly to Sarawak's Gross Domestic Product. Therefore, it is important to identify the factors that contribute to the productivity of this sector to enable optimum use of the State's resources and to optimize output.   The study proved that Sarawak was mainly an input-driven economy in the nineteen eighties and the nineteen nineties as labour and capital productivity were important sources of productivity. However, the economy of Sarawak is gearing towards a productivity-driven trend as technical advancements are making greater impacts on the economy.   It is also proven that labour productivity was more important than capital productivity in Sarawak's Industrial Chemicals Industry, Wood and Wood Products Industry and the Food Industries in the last decade.

INTRODUCTION

Sarawak's economy had always depended on the primary sector from the 1960s through to the 1970s and even up to the 1980s. For instance, in 1980**,** the manufacturing sector contributed a mere 7.7 percent to the state's Gross Domestic Product. However, the government was far-sighted enough to begin a series of restructuring in the early 1980s to enable the State's economy to diversify from being merely producing primary commodities to that of being able to produce manufactured products.

It can be seen from the table below that the manufacturing sector's annual growth is rather unstable with the highest annual growth recorded in 1987 and high growth in the manufacturing sector for the year 2000.   However, the growth of the manufacturing sector for the years 2001 and 2002 were rather low.

In contrast, the manufacturing sector's contribution to the State's gross domestic product was rather impressive increasing from 8.6 per cent in 1987 to 21.2 per cent in the year 2002. This shows that the manufacturing sector should be given proper recognition in view of its contribution to the State's Gross Domestic Product.

Table 1: The Manufacturing Sector's Annual Growth and Contribution to GDP

Year	Annual Growth (%)	Contribution to GDP (%)
1980	n.a.	6.8
1987	14.0	8.6
1990	n.a.	12.9
1997	10.7	22.1
1998	2.0	22.1
1999	6.5	22.4
2000	10.5	22.5
2001e	0.5	21.8
2002f	1.7	21.2

Note: e- estimate   f-forecast   n.a.- not available

Source :(www.sarawakchambers.net/scn/doclib.htm)

The manufacturing sector of Sarawak experienced tremendous growth. In 1994, the total value of this sector was merely RM8,754 but it grew to RM27,127 in the year 2000. This represented an increase of about 210 per cent. The industrial chemicals sub-sector grew at the fastest rate of 442 per cent from RM2,846 in 1994 to RM 15,438 in 2000. The wood based industries were in second place growing from RM2,941 in 1994 to RM4,670 in the year 2000. This represented an increase of 59 per cent. The food and beverages industry is in third place with an increase of 134 per cent rising from RM805 million to RM1,880 million in the year 2000. All the other types of industries namely, petroleum and petroleum products, electric and electronic, basic metal and metal fabrication, non-metallic products as well as other manufactured products experienced increases too for the period 1994 to 2000.

Table 2: The Components of the Manufacturing Sector of   Sarawak

Types	1994	1996	1999	2000
Food and Beverages	805	1,164	2,188	1,880
Wood-Based	2,941	3,788	4,256	4,670
Industrial Chemicals	2,846	5,165	9,798	15,438
Petroleum & Petroleum Products	1,063	1,384	1,150	1,696
Electric & Electronic	97	402	1,222	1,575
Basic Metal & Metal Fabrication	312	523	562	787
Non-Metallic Mineral Products	360	518	433	564
Other Manufactured Products	330	366	476	517
Total	8,754	13,3101	20,085	27,127

Source: www.sarawakchambers.net/scn/doclib.htm

In the early 1990s, manufactured goods did not contribute much to Sarawak's exports. However, because of the many incentives provided by the government, the manufacturing sector continued to grow and contributed most significantly towards Sarawak's exports in 1994 with a total of 16.14 per cent and in 1999 with 16.27 per cent. However, manufactured goods only made up 12.06 per cent and 12.67 per cent of the State's exports respectively in 2000 and 2001. This may be due to the downturn of the United States economy and the world recession which occurred at that particular period.

Table 3: The Contribution of Manufactured Goods to Exports

Year	Manufactured Goods (RM Million)	Total Exports (RM Million)	% of Manufactured Goods to total Exports
1990	293.40	11,283.50	2.60
1991	439.60	13,026.00	3.37
1992	744.60	12,497.10	5.96
1993	1,672.70	12,610.00	13.26
1994	2,174.10	13,470.30	16.14
1995	2,379.90	15,659.20	15.20
1996	2,920.10	18,429.90	15.84
1997	3,240.80	21,089.90	15.37
1998	2,985.30	20,100.80	14.85
1999	3,779.40	23,235.00	16.27
2000	3,756.10	31,152.00	12.06
2001	3,594.00	28,362.10	12.67

Source: Yearbook of Statistics: Sarawak 1999, 2002

It has been observed that the structure of Sarawak's economy has undergone tremendous changes in the last two decades. One of the most significant changes is that the economy is no longer dependent on primary commodities as its main exports. Today, products such as rubber, cocoa and palm oil are not very significant exports. It has also been seen that the State's Gross Domestic Product was growing at a very healthy level in the 1980s up to the time before the financial crisis which affected the economy from 1997 to 1998. In fact, Sarawak was badly affected by that financial crisis and registered a negative growth of 7.3 per cent in 1998.

In contrast, the contribution of the secondary sector to the State's Gross Domestic Product has been increasing since 1980. This is mainly due to the rapid growth of the manufacturing sector especially during the industrial phases of development which began in 1971. The emphasis on export-led industrial development met with much success during this period. The contribution of the manufacturing sector to Gross Domestic Product increased tremendously from 12.3 per cent in 1980 to 30 per cent in 1999. This proves that the manufacturing sector is the catalyst for growth in Sarawak's economy.

Although a few studies have been done to examine the growth of Sarawak's economy, they were not exhaustive studies because they were merely to examine the growth rates. It is important to determine the growth rate of Sarawak in the last decade and examine the specific factors that affect the growth of the manufacturing sector so that Sarawak can sustain its high-profile economic growth for the next decade in this challenging era of globalization. It is commonly acknowledged that productivity-driven growth is more sustainable than input-driven growth. An empirical analysis is necessary to ascertain the real productivity performance of the manufacturing industries for future policies in both the private and private sectors.

The objectives of this study are as follows: to determine the productivity of the Manufacturing Sector of Sarawak from 1980 to 2000 and to examine the productivity of the Industrial Chemicals Industry, the Wood and Wood Products Industry and the Food Industry in Sarawak from 1990 to 2000

The paper will be organized as follows; part one provides the background, objectives, scope and coverage of the study. Part two presents the existing literature review on the economic growth, productivity and development of with special emphasis on the manufacturing sector. Part three presents the research findings and discussions. And finally highlight the conclusions.

RELATED REVIEW

Classical economists such as Smith, Malthus, Ricardo, Ramsey, Young , Schumpeter and Knight were responsible for developing modern theories of economic growth. The classical economists believed that an increase in capital generates growth.

An important growth theory was contributed by Solow and Swan (1956). The main aspect of the Solow-Swan model is the neoclassical form of the production function. This function assumes constant returns to scale, diminishing returns to each input and some positive and smooth elasticity of substitution between the inputs. The production function is combined with a constant-saving-rate rule to generate an extremely simple general-equilibrium model of the economy.

In Sarawak, foreign direct investment plays a very important role in the development of the manufacturing sector. This is because most of the industries, particularly the electronic industries require huge amounts of capital for the initial set-up.

Zainal Abidin (1986) examined the role of the manufacturing sector in the economic development of Sarawak with emphasis on how the government can develop those industries which uses natural resources.

Danaraj (1994) concluded that Sarawak should focus on high value added and knowledge intensive industries in order to remain competitive. He listed factors such as stable economy, good education system, research and development, good quality of the factors of production and required technology as being able to contribute to a high value added industries. Syawe (1990) studied the value added and employment in the small and medium size industries of Sarawak.

MODEL AND RESULTS

The data for this study is taken mainly from the Yearbook of Statistics of Sarawak and Malaysia for the period 1980 to 2002. Some data is also taken from the Economic reports published by the Ministry of Finance for various issues. Certain unpublished data is taken from the Ministry of Industrial Development and the Ministry of Industrial Development Authority. The Cobb-Douglas Production Function is used to assess productivity and efficiency in this study.

Model 1 (1980-2000 - Two Variable Model)

$\log X = \log A + \alpha \log L + \beta \log C$

Where
X is the value added in the production
A is the efficiency parameter parameter that reflects the total factor productivity of the techniques of production (TFP)
α is the elasticity of output with respect to the labour input. The labour input is measured based on the number of paid employees at the end of each year.
β is the elasticity of output with respect to the capital input. The capital input is measured using the value of fixed assets at the end of the year.

Using the regression technique, the results of the manufacturing sector in Sarawak from 1980 to 2000 is shown as follows:

$\log X =$ 0.847   +   0.548logL   +   0.661log C
    t   (6.48)   (8.074)   (3.098)
   R_2 = 0.932   Adjusted R_2 = 0.924
   F   = 123.401   Durbin-Watson = 0.988

The findings from this model shows that about 92 per cent of the variables affect the value added in the manufacturing sector. This is indicated by the value of R_2 as 0.932 and the adjusted R_2 as 0.924. The high value of F as 123.401 is significant also indicates that the variables has a joint effect on the value added in the manufacturing sector. The Durbin Watson value of 0.988 lies between the upper value of 1.277 and the lower value of 0.890 at 10 per cent significance. This shows that there is inconclusive evidence regarding the presence or absence of positive first-order serial correlation.

The constant which is valued at 0.847 indicates that a one per cent increase in technology will enable a 0.847 per cent increase in the value added for the manufacturing sector between the 1980 and 2000 period. The regression coefficient of 0.548 for employees employed during this period shows that if there is a one per cent increase in the number of employees, the value added will increase by 0.548 per cent. However, if the fixed assets increase by one per cent, then the value added will increase by 0.66 per cent.

Therefore, to increase productivity, more capital should be employed rather than labour as that creates greater productivity. This result is in tandem with Tham (1995) which concluded that capital inputs contributed 104 per cent and labour 18 per cent respectively towards the growth of the economy.

Model 2 (1980-2000 Three Variable Model)

$\log X = \log B + \alpha \log L + \beta \log FA + \theta \log W$

Where
X is the value added in the production of the manufacturing industry
B is the efficiency parameter that reflects the total factor productivity of the techniques of production (TFP) in the manufacturing sector
α is the elasticity of output with respect to the labour input. The labour input is measured based on the number of paid employees at the end of each year.
β is the elasticity of output with respect to the capital input. The capital input is measured using the value of fixed asset at the end of each year.
θ is the elasticity of output with respect to the cost of production. The cost of production is measured using the wages received by the employees at the end of each year.

$\log X =$ -1.256 - 0.380logL + 0.48logFA   +   0.828logW
    t = (-0.844)   (-0.876)   (4.603)   (2.297)
    R_2 = 0.948   Adjusted R_2 = 0.939
    F   = 103.568   Durbin-Watson = 1.091

The findings from this model shows that about 94 per cent of the variables affect the value added in the manufacturing sector. The F value of 103.567 is significant and shows that the identified variables have a joint effect on the value added of the manufacturing sector. The Durbin-Watson value of 1.091 shows that there is inconclusive evidence regarding the presence or absence of positive first-order serial correlation.

In this model, it was found that if there is a one per cent increase in technology, value added will decrease by 1.256 per cent. This shows that the technology employed may be expensive and is not able to yield profit in the short-run. In addition, the wage factor may have caused the productivity to decrease as the higher wages may not have led to increased production.
The regression coefficient of -0.380 for employees employed during this period shows that if there is a one per cent increase in the number of employees, the value added will also decrease by 0.38 per cent. In addition, if fixed assets increased by one per cent, then the value added will increase by 0.486 per cent.

Thus, it is important that manufacturers increase their fixed assets since that will contribute to higher productivity. It was found that a one per cent increase in wages would cause a 0.828 per cent increase in value added. Thus, an increase in wages would motivate the workers to work harder and thus increase the productivity in the manufacturing sector. This conclusion is also shared by Jomo (1993) who states that the growth in the Malaysian manufacturing sector has led to a rapid expansion in earnings.

Model 3 (1980-1989)

$$\log X = -4.820 + 1.135\log L + 0.648\log C$$
$$t = (-0.465) \quad (1.064) \quad (10.630)$$
$$R_2 = 0.951 \quad \text{Adjusted } R_2 = 0.937$$
$$F = 67.633 \quad \text{Durbin-Watson} = 2.799$$

For the period of 1980 to 1989, the findings show that about 94 per cent of the variables affect the value added in the manufacturing sector. The F value of 67.633 is significant and shows that the identified variables have a joint effect on the value added of the manufacturing sector. The Durbin-Watson value of 2.799 shows that the hypothesis null is accepted and that there is no auto-correlation between the variables in this model.

In this model, it was found that if there is a one per cent increase in technology, value added will decrease by 4.820 per cent. This shows that the state of technology employed may be expensive and has not brought any returns to scale as yet. The regression coefficient of 1.135 for workers employed shows that if there is a one per cent increase in the number of employees, the value added will increase by about 1.135 per cent. In addition, if fixed assets increased by one per cent, then the value added will increase by 0.648 per cent. Thus, it is important that manufacturers increase their labour more than their fixed assets to attain higher productivity.

The finding is similar to studies done by Tham (1994,1995) and Chong (1995) which show that the productivity of the manufacturing sector at this particular period is more dependent on input growth rather than on productivity growth. There was also a low productivity growth for the manufacturing sector during this period.

Model 4 (1990-1999)

$$\log X = 6.498 + 0.166\log L + 0.592\log C$$
$$t = (1.585) \quad (0.187) \quad (1.041)$$
$$R_2 = 0.753 \quad \text{Adjusted } R_2 = 0.683$$
$$F = 10.677 \quad \text{Durbin-Watson} = 0.817$$

For the time period of 1990 to 1999, the findings show that about 75 per cent of the variables affect the value added in the manufacturing sector. The F value of 10.677 is significant and proves that the identified variables have a joint effect on the value added of the manufacturing sector. The Durbin-Watson value of 0.817 shows that there is inconclusive evidence regarding the presence or absence of positive first-order serial correlation.

In this model, it was found that a one percent increase in technology, value added will increase by 6.498 per cent. This shows that the state of technology employed has brought a lot of returns to scale. The regression coefficient of 0.166 for workers employed shows that if there is a one percent increase in the number of employees, the value added will increase by about 0.166 per cent. In addition, if fixed assets increased by one percent, then the value added will increase by 0.592 per cent. Thus, it is important that manufacturers increase their fixed assets since they contribute more to productivity than the labour input.

The finding is similar to that of Abang Wahab Muhamad (2001) who concluded that Malaysia's economic growth was stimulated by investments with capital accumulation contributing more than 50 per cent to the productivity growth. Garcia-Blanch (2001) also found that capital accumulation is extremely important for South Korean economic growth.

The regression analysis results show that the total factor productivity was best during the 1990-1999 period. However, total factor productivity was negative in the 1980 to 1989 period. Overall, the total factor productivity was low during the 1980 to 2000 period. This finding confirms Tham's study (1995) that total factor productivity is low in the Malaysian manufacturing sector.

THE PRODUCTIVITY OF THREE MAIN INDUSTRIES

There are a total of nineteen industries in the manufacturing sector. This information is recorded in the Yearbook of Statistics for Sarawak. Below is a table that shows all the different industries found in the manufacturing sector of Sarawak.

Table 4: The Industries of the Manufacturing Sector

1. Food Manufacturing
2. Beverage Industries
3. Manufacture of textiles and apparel
4. Manufacture of wood and wood products
5. Manufacture of furniture and fixtures
6. Manufacture of paper and paper products
7. Printing, Publishing and allied products
8. Manufacture of Industrial Chemicals
9. Manufacture of Other Chemical Products and Crude Oil Refineries
10. Miscellaneous Products of Petroleum and Coal
11. Manufacture of rubber products
12. Manufacture of Plastic Products
13. Manufacture of pottery, China and Earthenware
14. Manufacture of Non-Metallic Mineral Products
15. Iron and Steel Basic Industries and Non-Ferrous Metal Basic Industries
16. Manufacture of Fabricated Metal Products
17. Manufacture of Machinery
18. Manufacture of Transport Equipment
19. Other Manufacturing Industries

Source: Yearbook of Statistics, Sarawak 2002

An analysis is carried out on the three main industries of the manufacturing sector based on the current prices for a time series of ten years beginning from 1990 to 2000.

The production function is $\log F = \log T + \alpha \log L + \beta \log C$

Where F stands for value added
      T stands for level of technology
      L stands for labour productivity
      C stands for capital productivity

The Industrial Chemicals Industry

The Industrial Chemicals industry is the most important industry in the manufacturing sector. It contributes the most to output value for the manufacturing sector.

$$\log P = 2.415 + 1.371L - 0.382C$$
$$t = (1.654) \quad (13.845) \quad (-3.381)$$
$$R_2 = 0.966 \quad \text{Adjusted } R_2 = 0.957$$
$$F = 112.690 \quad \text{Durbin-Watson} = 1.618$$

The analysis of the Industrial Chemicals Industry proves that the productivity of this industry is dependable on labour only. A one per cent increase in labour inputs will result in 1.371 per cent increase in the productivity of the industrial chemicals industry. However, a one per cent increase in fixed assets resulted in a 0.381 per cent fall in the productivity of this industry. This is probably due to the high cost of the fixed assets not being able to generate a profit in the short run but may be able to generate profitability in the long run.

From the figure below, it can be concluded that the labour productivity of the Industrial Chemicals Industry is high. From RM1,104,641 in 1990, it has increased to 2,625,449 in 1998 and RM4,318,088 in the year 2000. This proves that the labour productivity has increased by 25 per cent in the last 10 years. The capital productivity of the Industrial Chemicals Industry is 0.54 in 1990. It improved to 0.76 in 1999 and by the year 2000, it increased to 1.25. This shows that the capital productivity has increased by more than 50 per cent for the period 1990 to 2000.

As for capital intensity, the fixed assets used per employee in 1990 was RM2,055,696. The highest capital intensity was in 1996 when RM4,588,028 was allocated per employee. By the year 2000, the capital intensity had dropped to RM3,446,416. The wage-labour ratio in 1990 was RM44,725. This trend continued for seven years and by 1997 it peaked at RM53,008. By the year 2000, the wage-labour ratio again dipped to RM44,368. Generally, it can be concluded that the wage-labour ratio is around the RM40,000 mark.

The results obtained concur with that of Singh and Maisom (2001) in that labour productivity is higher than capital productivity.
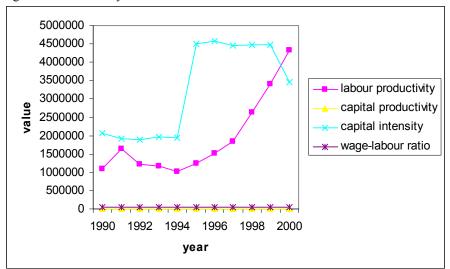
Figure 1: Productivity of the Industrial Chemicals Industries

Source: Author's Figures

The Wood and Wood Products Industry

The Wood and Wood Products Industry is the second most important industry in the manufacturing sector. It contributes the second highest amount in terms of output value in the manufacturing sector.

Log P = 0.824 + 2.003L - 0.601C
t = (0.509) (12.695) (-1.715)
R_2 = 0.954 Adjusted R_2 = 0.942
F = 82.419 Durbin-Watson = 1.115

The regression analysis results show that a one per cent increase in technology will effect a 0.824 per cent in value added for the Wood and Wood Products Industry. It also shows that the productivity of the Wood and Wood Products Industry is more dependent on the labour input. This is because during the period of 1990-2000, the capital input did not contribute to the productivity of the wood and wood based industry. A one per cent increase in labour contributed to a 0.824 per cent increase in the productivity of this industry whereas a one per cent increase in fixed assets decreases value added by 0.601 per cent.

This signifies that to increase productivity , managers in this industry should increase their labour input. However, the result may also indicate that the capital investment in the Wood and Wood Products Industry is heavy and expensive and therefore may not yield any return in the short run.

The analysis from the table below also shows that the labour productivity has increased from RM14,572 in 1990 to RM29,512 in the year 2000. The capital productivity is not stable. In 1990, it was 0.51 but over the years it dipped to a low of 0.31 in 1992. However, by the year 2000, it improved to 0.35. This is relatively low and may be due to the heavy costs of machinery which could not generate any return in the short-run.

The capital intensity for the Wood and Wood Products Industry is also increasing from RM28,508 in 1980 to RM77,190 in 1995. By 2000, the capital intensity has increased to RM84,651 causing almost 197 per cent increase over the 1990 capital intensity value. This proves that the industries are heavily investing in capital goods such as machinery.

The wage-labour ratio in 1990 was RM5,574. It increased to RM7,399 in 1995. By the year 2000, the wage-labour ratio has increased to RM8,841. It shows that the cost of labour is increasing in the Wood and Wood Products industry. If this is not matched by increased productivity, Sarawak could lose its competitiveness in attracting foreign investments for this industry.

The findings from the wood and wood products industry are similar to Singh and Maisom's (2001) conclusion in that labour productivity is more significant than capital productivity.
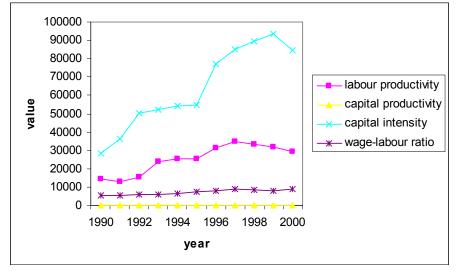
Figure 2: Productivity of the Wood and Wood Products Industries

Source: Author's Figures

The Food Industry

The food industry is the third most important industry in the manufacturing sector. It contributes the third highest amount in terms of output value in the manufacturing sector.

The regression result is shown as follows:

$$\text{Log F} = 7.214 + 1.303\text{L} + 0.184\text{C}$$
$$\text{t} = (5.788) \quad (1.096) \quad (11.009)$$
$$R_2 = 0.952 \quad\quad\quad \text{Adjusted } R_2 = 0.940$$
$$\text{F} = 79.673 \quad\quad \text{Durbin-Watson} = 1.659$$

The regression analysis results show that the total factor productivity of the food industries in Sarawak is quite high. For labour, a one percent increase in labour will effect a 1.303 percent increase in Value added while a one percent increase in total assets will increase value added by 0.184 percent. This proves that to increase overall productivity in the food industries, it is recommended that labour inputs be increased rather than capital inputs.

The findings show that the productivity of the food industries depends on both labour and capital productivity. The regression results prove that the labour productivity contributed about six times more to productivity as compared to capital productivity. It also proves that the food industries are more labour intensive rather than capital intensive. Labour productivity and capital productivity improved throughout the period of 1990 to 2000. Capital intensity was highest in 1997. The wage-labour ratio also improved steadily from 1990 to 2000.

The food industry's findings also confirms Singh and Maisom's (2001) findings in that the manufacturing sector is input-driven rather than productivity-driven.
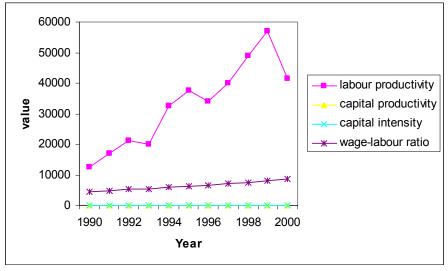
Figure 3: The Productivity of the Food Industries

Source: Author's Figures

In conclusion, it was found that the top three industries of the manufacturing sector in Sarawak had different levels of labour and capital productivity.

We deduce that labour productivity is highest in the Industrial Chemicals Industry at RM4,318,088 followed by the Food Industry and lastly by the Wood and Wood Products Industry.

As for capital productivity, the Food Industry shows the best productivity with an index of 1.60. The Industrial Chemicals Industry is in second place and the third best in capital productivity is the Wood and Wood Products Industry.

The capital intensity is highest in the Industrial Chemicals Industry at RM4,588,028.. The wood and Wood Products Industry has higher capital intensity than the Food Industry. The lowest is the Food Industry at 5.07 reflecting on little use of machinery for processing of food products.

The wage-labour ratio does not differ significantly in the three industries. It ranges from RM4,000 to RM8,000

CONCLUSIONS

Total Factor productivity is important in an era of knowledge-based economy as it measures endogenous technical change and other characteristics of a knowledge-based economy. Factors such as human capital, innovation and investment in technology and information communications technology are the cutting edge in enhancing the economy's competitiveness.

Productivity has always been the main focus of Sarawak in its quest to be an industrialized country in the near future. A rate of high productivity would enable the country to compete globally. A productivity-driven strategy rather than input-driven strategy would enable Sarawak to sustain its productivity in the long run. This concept was acknowledged in the Seventh Malaysian Plan.

Productivity improvement is very important to Sarawak's economic growth and competitiveness. To increase productivity, greater efforts must be made to upgrade skills, adopt better management systems, upgrade research and development as well as to produce high quality goods and acquire internationally recognized quality standards. The success of enhancing total factor productivity or productivity driven strategy depends on the availability of a quality workforce. Workers need to acquire new skills to enable them to operate new and up-to-date technologies more efficiently.

Even though Sarawak is endowed with rich natural resources, it is important to ensure that the most value added industries connected to agriculture and mining are developed so as to maximize value-added. Therefore, industries that can deliver high value-added should be given priority in Sarawak.

The manufacturing sector is expected to grow by 4.5 percent in 2003 because of expected increase in the production of liquefied natural gas. The food processing industry, chemical products industry, crude oil refineries and transport equipment industry are all expected to have positive growth during 2003.

From the 1990s, the manufacturing sector has gained importance and is contributing more to the Gross Domestic Product of Sarawak. Comparatively, the figures show that in 1980, the Gross Domestic Product of Sarawak was only RM5,317 million and the manufacturing sector's output was valued at RM1,069 million whereas by the year 2000, the Gross Domestic Product has increased to RM30,919 million and the manufacturing sector's output has increased to RM27,127 million.

This study provides some empirical values on the importance of the labour and capital productivity to the manufacturing sector of Sarawak.

The analysis on the total factor productivity of the manufacturing sector in Sarawak shows that in the last twenty years, that is from 1980 to 2000, the total factor productivity was only about 0.847. From 1980 to 1989, total factor productivity was -0.482 indicating that there was negative productivity during that period. However, the total factor productivity improved in the 1990 to 1999 period to attain a productivity figure of 6.498.

The study on labour and capital productivity shows that the labour productivity increased in the last twenty years while the capital productivity is rather unstable with ups and downs during the last twenty years. Comparing the food industry and the wood and wood products industry, it was found that labour productivity was more significant in the wood and wood products industry than in the food industry

On the other hand, capital productivity is gaining importance in the manufacturing sector. The analysis shows that capital productivity is more significant in 1980 at 0.8 but it declined after that due to world depression in the 1980s and the financial crisis in the late 1990s. However, by 2000, the capital productivity has improved to 0.9.

REFERENCES

Abang Wahab Muhamad Dr. (2001). *Measuring Total Factor Productivity- TFP Survey Report- Malaysia*. Tokyo: Asian Productivity Organization

Achuk N. (2003 July 26), *Growth through Industrialization. Sarawak Tribune*

Pelipe J.(1997). *Total Factor Productivity Growth in East Asia: A Critical Survey*. The Philippines: Asian Development Bank,

Ghazali (1994). *Foreign Investment* in Jomo K.S. (ed) Malaysia's Economy in the Nineties. Kuala Lumpur: Pelanduk Publication (M)

Gujarati D. (1999). *Essentials of Econometrics*. Singapore: McGraw Hill International Edition

Lim D. (1975). *Industrialization and Unemployment in West Malaysia* in Lim D. (ed), Readings on Malaysian Economic Development. Kuala Lumpur, Oxford University Press

Lok L.L. and Maisom Abdullah (2001). *Analyzing TFPG Towards Realizing a Productivity-Driven Growth Strategy for the Malaysian Manufacturing Sector in Issues in Industry and Trade*. Kuala Lumpur: Imagepac print (M) Sdn. Bhd.

Maisom Abdullah (1998). *Total Factor Productivity Growth: Issues and Outlook* in Productivity for Sustainable Development. Kuala Lumpur: University of Malaya Press

Malaysia, (1981-2002). *National Productivity Report*, Malaysia. Kuala Lumpur: National Productiviy Centre

Malaysia, (1981-2002). *Year books of Statistics*, Malaysia. Kuala Lumpur: Department of Statistics

Osman Rani, Jomo K.S. and Ishak Shari (1981). *Development in the Eighties with Emphasis on Malaysia*. Bangi, Universiti Kebangsaan Malaysia

Ozanne A.G. (1998). *Total Factor Productivity and Its Determinants: Evidence from the High-Performing Asian Economies*. www.apru.nus.edu.sg/activities/dsc

Sarawak, (1981-2002). *Year books of Statistics*, Sarawak. Kuching: Department of Statistics

Sarawak Chambers of Commerce, (2002). Investments in Sarawak. http://www.sarawakchambers.net/scn/doclib.htm

Singh (1998). *Total Factor Productivity in the Manufacturing Industries in India*. India: www.indianeconomics.org/journalvol48od.htm

Singh N.C. and Maisom Abdullah *(2001. Three-Input Modeling of Total Factor Productivity Growth in the Malaysian Manufacturing Sector*. Kuala Lumpur: Imagepac Print (M) Sdn. Bhd.

Solow R. and Swan (1956). A Contribution to the Theory of Economic Growth, Quarterly Journal of Economics 70

Syawe I. and Amin N. and Yap Y. (1990). *Report on a study of Small and Medium Industries in Sarawak*. UITM Kuching: ITM Research and Consultancy centre

Tham S.Y. (1995). *Productivity, Growth and Development in Malaysia*. Singapore: The Singapore Economic Review Vol 40

Tham S. Y. (1996). *Productivity and Competitiveness of the Malaysian Manufacturing Sector*. Kuala Lumpur: University of Malaya Press

Yap Y. and Amin N. (1995). *Factor Productivity and Competitiveness of the Malaysian Industries*, presented at the First Annual Asia Academy of Management Conference 6-7 December 1995

Zainal Abidin (1988). *Contribution of Manufacturing Industries to the Development of Sarawak*. Kuching: Angkatan Zaman Mansang

Forecasting Practices and Comparative Analysis of Potential Selective Methods in a Small Medium Company in Selangor: A Case Study

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ASTRACT
This study was conducted in a small medium scale local manufacturing company known as ALSB in Selangor producing elbows and reducers used in petroleum industry. The primary focus of this study is the forecasting practices of the company, which is very much gloomed by problems such as overproduction, unreliable sales forecast, long lead-time and massive inventory. Up until this study has been conducted, there is no quantitative forecasting method applied and the company forecasts its sales and production mostly based upon judgmental forecasting (human judgment). Comparison between actual sales and forecasted sales for both products has also been carried out to examine the performance of current forecasting method. The results shows significant gap between actual and forecasted sales, supporting the fact that the company is facing critical problems regarding their forecasting method. In the mean time, several quantitative forecasting methods have been suggested as potential solution such as the moving averages, simple exponential smoothing and decomposition methods. Then, comparative analysis of those methods has been conducted using the MAD and MSE techniques. Generally, the findings shows better performance in terms of forecast accuracy for the decomposition methods in almost every size of both elbows and reducers compared to the moving average and simple exponential methods. Nonetheless, considerations are also given to other forecasting methods for future potential application such as the regression techniques, Census II, and the Box-Jenkins method.

INTRODUCTION

Brief background of the company

ALSB is a full fledge manufacturing company involved in the production of carbon steel butt weld fittings. The factory is sited on a 3.4-acre idyllic mining land in Batang Berjuntai, Kuala Selangor. The company was incorporated in 1994 and production did not commence until 1995. When the company first started, the target market for the company was the export market. The company's products are mainly used for gas reticulation for factories and pipelines. The main export market is the United States where consumption of pipe and fittings exceed 11,000 metric tones a month. In 1994, there was a dumping penalty imposed on Malaysian steel products exported into the United States. The anti-dumping petition filed by American manufacturers of steel pipes and fittings has caused serious problems to the Asian manufacturers in Thailand, Taiwan, Korea and Malaysia as a very high levy is imposed as soon as products arrived in United States resulting in non-competitive pricing. The dumping petition was finally lifted in 1996. Malaysia at one time was enjoying the benefits under the GSP or the Generalised System of Preference where reduced levy was given for Malaysian manufactured products. However, once the GSP was withdrawn in 1995 ALSB was no longer able to enjoy the benefits and had to compete with other Asian manufacturers on level terms.

Realizing the shrinking market and the highly competitive market ALSB is operating, the top management of the company has decided to focus on local demand and applied for a vendor development program with the local oil and gas company, Petronas. In 1996, after much scrutiny and severe audits (due to high product safety requirement) the company was finally accepted into the Petronas vendor development program. Even after being conferred the VDP

status orders were very hard to come by as a result of limited range of products produced at the factory in Batang Berjuntai and ALSB very soon realized that it had to obtain support from other mills in the world to complement its range for fittings to service the Petronas and local oil and gas market. Despite the trials and tribulations, the company has now successfully been awarded the ISO 9002 certification, which allows it to venture into other markets. With increased turnover and profitability the company now is at a crossroad as it plans out its activities into the new millennium.

In terms of the product itself, ALSB's main product lines are carbon steel elbows and reducers that are used for oil and gas reticulation. In construction of a pipeline system the design will require bends or curvature for flow control and elbows and reducers are used to divert the flow of fluid, gases or crude. There are various grades of material for pipes and fittings for example stainless steel and alloy steel as well as carbon. The usage of grades of materials depend on the viscosity and properties of material that passes through the pipes e.g. for acidic environment or sour services high-grade material is used like chrome-molly material. Carbon steel is the low-grade material and does not have too many added values and is therefore considered like more of a commodity item.

Table 1: Company's product range (Elbows and Reducers)

PRODUCT	SIZE RANGE
Long radius 90 degree elbow	3/4" to 4"
Concentric reducers	3/4" to 12"
Eccentric reducers	3/4" to 12"

In terms of the market, two-thirds or 70% of ALSB market is coming from the overseas mainly United States and Europe, while the remaining 30% of the demand is from the local market. The international market is characterized by hard bargains and rock bottom prices. Business is based on volume and trading margin is normally very thin. Payments are normally very prompt. The United States of America are the largest buyers of fittings from Malaysia. The fittings are normally manufactured according to the ANSI or American national Standard Institute standards. Fittings to Europe are normally manufactured according to the DIN or German standards while Japanese has its own standards.

The domestic market are also controlled by stockist even though they stockholding are not as big as their US counterparts. In Malaysia there are a few well-known stockist and agents who have traditionally dominated the market namely Wan Hong hardware, Van Leeuven and other companies from Singapore like Sin Soon Huat and federal hardware. Stockist normally purchases ALSB's products like Wan Hong and theses products are normally sold to fabricators or contractors of Petronas or Gas Malaysia. In addition ALSB also sells its products directly to fabricators, shipyards and also to Petronas itself.

ALSB's clients include the following:-
- Esso Production Malaysia Inc.
- Petronas Gas Berhad
- Malaysia Shipyard and Engineering
- Sime Sembawang Engineering
- Penang Shipyard and Construction
- JGC Corporation
- MMC Chiyoda Joint Venture
- Promet Fabricators
- Ho Hup Construction
- Technip Malaysia
- Toyo Engineering
- Bechtel Corporation
- Orbtech Sdn Berhad
- Brooke Dockyard

The demand for ALSB's products depends so much on activities in oil and gas in offshore and onshore for example in offshore activities if the demand for crude oil and gas is low resulting in lower crude prices, the activities in the shipyard for example the topside and jacket fabrication will be reduced resulting in lower demand for products. As a result of Petronas involvement in petrochemical industry, ALSB's product became highly in demand. The advent

of Gas Malaysia is very interesting for ALSB as the demand will increase as more housing and industrial estates begin to utilize natural gas for heating. However, current usage is limited to industrial only. Talking about competition in the market, internationally, ALSB competes with other manufacturers in Taiwan, Korea, China, Thailand and also Europe and US itself. On the other hand, domestic market saw ALSB competes with non-Bumiputera manufacturers with the likes of Ing Teik Holdings Berhad and Arah Dagang Sdn Berhad. These companies are unable to penetrate the Petronas market and they normally market their products through their hardware dealers' network throughout Malaysia. They have also used a strategy of producing general-purpose fittings using welded pipes for local engineering and water pipelines.

OBJECTIVE OF THE STUDY

Primarily, objective of this study is to identify the best potential quantitative forecasting methods to the company. Sub-objectives of this study are to identify and understand current forecasting methods of the company, and to propose the best possible forecasting methods through comparative analysis of the suggested techniques.

Forecasting in Business: a Literature

Forecasting, according to Render and Heizer (2004), is the art and science of predicting future events. Generally, there are three major types of forecast, which are economic, technological and demand forecasts. In terms of techniques, Hanke and Reitsch (1998) stated that many of the forecasting techniques used today were developed in the nineteenth century, and some such the Box-Jenkins method have only been recently developed. But the most important issue perhaps is, why forecasting is so crucial to the business? Makridakis, Wheelwright and Hyndman (1998) quoted that there is a critical need for forecasting activities in aiding planning and decision-making processes in any organization. They also pointed out that forecasting plays an important role in scheduling the resources, material planning as well as critically influencing company's strategy.

Arnold and Chapman (2001) further strengthen the point by mentioning that forecasting is inevitable in developing plans to satisfy future demand. Unsurprisingly, talking about future demand brought us back to Hanke and Reitsch (1998) who also cited that the main answer of why forecasting is so necessary, is that all organizations operate in an atmosphere of uncertainty and that, in spite of this scenario, decisions must be urgently made that affect the future of the company. Chase, Aquilano and Jacobs (2002) stated that forecasts are vital to every business organization and for every significant management decision, while Sanders (1995) quoted that forecasting is the most critical organizational functions and serves as a basis for all other business decisions. In practice, according to Smith III (1996), significantly in a survey of 175 companies the United States, 92 percent of the respondents indicated that forecasting was important for their company's success**.**

In terms of classification of methods, generally there are two types of forecasting techniques namely the qualitative and quantitative approaches, though Arnold and Chapman (2001) also comes up with three different categorization of qualitative, extrinsic and intrinsic forecasting. Qualitative forecasting, according to Gaynor and Kirkpatrick (1994), are used when historical data concerning events to be predicted are either scarce or unavailable, or when the events to be projected are affected by non-quantifiable information or drastic technological change. In other words, qualitative forecasting (sometimes known as subjective or judgmental methods) are either exploratory or normative. By procedure, qualitative forecasting can be divided into two types of judgmental and counting methods. The judgment methods consist of naïve extrapolation, sales-force composite, executive opinion, scenario methods, Delphi technique and historical analogy. On the other hand, counting methods comprise of market testing, consumer and industrial market survey. Gaynor and Kirkpatrick (1994) pointed out that the most commonly used qualitative methods are sales-force composite, executive opinion and the Delphi technique.

Unlike the qualitative methods, quantitative forecasting methods are based mainly on the statistical analysis of past data. Commonly it can be classified into two types of the time series and the explanatory methods. Nahmias (1997) cited that a time series method is one that use only past values of the phenomenon that are predicting, while explanatory methods, which also known as causal models are the ones that use data from sources other than the series being predicted (there may be other variables with values that are linked in some way to what is being forecasted such as prices and amount of advertising). Example of causal model is the regression analysis, while methods such as the moving averages, exponential smoothing and the classical decomposition methods (additive and multiplicative procedures) are some of the examples of the time series methods. For the purpose of this study, focus was on the time series as the proposed methods to be considered by the management. Moreover, until this study is

written, management of ALSB is using only judgmental forecasting methods, while application of quantitative techniques is nowhere to be seen.

Briefly on the time series methods, the simple moving average, according to Gaynor and Kirkpatrick (1994), is most often used for simple descriptive patterns of a time series variable and a very simple procedure for forecasting a time series data. Wheelwright and Hyndman (1998) pointed out that moving averages provide a simple method for smoothing the "past history" data and it is obtained by finding the mean for a specified set of values and then using it to forecast the next period. In the mean time, Hanke and Reitsch (1998) defined the exponential smoothing method as a procedure for continually revising a forecast in the light of more recent experience, changes or for fluctuations in the data. In addition, according to Silver, Pyke and Peterson (1998), the simple exponential smoothing method is probably the most widely used statistical method for short-term forecasting. The decomposition methods, on the other hand, works best for data containing elements of seasonality, cyclical and trend. That is why Hanke and Reitsch (1998) suggested that one of the techniques that should be considered when forecasting seasonal data is the classical decomposition methods, both multiplicative and additive techniques. The methods (multiplicative and additive) are also regarded as far more simple, less complicated and easy to understand compared to other forecasting techniques in which specifically designed to address seasonal, trend and cyclical data. More importantly, the availability of various forecasting software such as IMPACT, SAS, SPSS, SYSTAB, QM for Windows, and Minitab, according to Render and Heizer (2004), could significantly enhance performance of the analysis as well as the size of information that can be processed within shorter period of time.

In the mean time, Arnold and Chapman (2001) stated that in order to determine forecast accuracy of the suggested forecasting methods, measuring forecast errors through application of Mean Absolute Deviation (MAD) and Mean Squared Error (MSE) are among the best techniques of solving this issue. Stevenson (2002) define MAD as the average absolute error, while MSE is the average of squared errors. The difference between these two measurement techniques is that MAD weights all errors evenly, while MSE weights errors according to their squared values. Again according to Stevenson (2002), one use for these measures is to compare the accuracy of alternative forecasting methods in which will be analyzed later in this study.

RESEARCH METHODOLOGY

This study was mainly conducted through a case-study-type approach in which focus was on ALSB current forecasting system. Collection of data was carried out via two main sources, which can be classified as primary and secondary data. Primary data was collected through factory observation and extensive interviews with some of the managers and executives of the company, while secondary data was obtained through company's annual report and inventory records, and from books, articles, journals as well as Internet. Roughly, the researcher has spent almost three months of on-site data collection in which covering interviews, observations, and analyzing company's inventory reports.

CURRENT FORECASTING APPROACH OF THE COMPANY

Looking at both forecasting and supply chain environment of the company, element of uncertainty indeed clouding company's operations. Though lead time of raw material delivery is known to be six months (which is bad enough!), guarantee of prompt delivery by its supplier is something which is quite a missing value. Understandably and perhaps unfortunately, the main supplier of this company is Sumitomo Industry, which is located in Japan. Difficulty to find local supplier in which capable of meeting stringent quality standard of the material needed has forced ALSB to look for potential foreign suppliers around the globe. End up, apart from Sumitomo Industry, ERNE from Austria is another available business partner specializing in production of more than 4-inches elbows and reducers.

Unstable and inconsistent demand particularly from major overseas market in which accounted for 70% of total company's sales has also seen ALSB struggling with over production as well as massive end-product inventory. Continuous predictions of a consistent increase of 10% of sales set by top management is mainly based upon past years' good sales performance. However, severe economic recession from 1997 – 2000 has critically affecting demand for both company's product resulting in huge unsold finished product, reducer in particular. Badly enough, the company has been forced to shut its production of reducers down due to the escalating roof-top level of finished good inventory and shifted its workers from that factory to the elbows-making operations.

Despite those uncertainties, there is somehow a non-written compromise due to distance factor whereby ALSB is given a flexible lead-time of finished goods delivery to its foreign customers in US and Europe. A maximum of two months is given to ALSB to deliver the entire ordered product to the doorstep of their customers. In terms of the product itself, demand for elbows and reducers are significantly depending upon growth of oil and gas, and piping industry. In another words, ALSB is dealing only with corporate customers in which they were also vulnerably exposed to changes in the marketplace as well as highly particular in terms of quality of the supplied products.

Forecasting Basis and Current Techniques

Generally, up until this study was written and completed, there was no quantitative method applied in the company's forecasting activities. Decisions on sales forecast are significantly influenced by annual top management target of 15% increase every year in which on certain occasions defying the impact of market instability as well as potential demand uncertainty. Beside that, notable consideration was also given to past years' sales performance as one of the indicator in setting up the new sales forecast. Unsurprisingly, soaring sales forecasts was initiated and developed based on those good past years' sales achievement, and obviously it was before the economic turmoil.

Judgmental forecasting is also actively practiced in ALSB whereby top management decisions have the foremost upper hand in deciding future anticipated sales. In fact, 15% consistent annual increase is developed based on the top management ideas of motivating their workers to be more proactive and aggressive. Unchanged positive sales forecast even during period of economic downturn was also based upon top management believe that 70% of their business is export-oriented (US and Europe markets) and hence, will not severely affected by negative regional economic changes. Reality though hurts with 2000 sales plunged into its one of the lowest ever sales performance both locally and globally, and yes raising doubt over ALSB current forecasting method.

Performance measurement of Elbows: forecasted VS actual sales

Performance of current forecasting approach is measured through comparative analysis between actual sales and forecasted sales within the same period of measurement in which in this case is the year 2000. Total sales forecast for elbows for all sizes throughout the year 2000 was 447,100 pieces. From that figure, highest sales were consistently expected from small-medium size elbows ranging from 1 ¼ to 2 inches, which are jointly accounted for 52% of total projected sales. Contrary, lower sales were anticipated from larger size of elbows especially 3 and 4 inches in which only accounted for a combine expected sales of 10%. Subsequently, sales forecast of elbows for the year 2001 was 526,000 pieces, an increase of roughly 15% from the previous year and a figure derived from the annual increase set up by top management.

But how was the actual sale? Sadly, total actual sale was only 324,456 units compared to early projection of 447,100 units. If production was not even adjusted, finished goods inventory will definitely accumulate up to 122,644 units after twelve-months trading. The gap between actual and forecasted sales has critically getting wider during second and fourth quarters of the year (except November) as shown in table 4.1. Throughout the year, only for the periods of February and October actual demand exceeds level of sales forecast and this scenario cannot be categorized as a positive tone for the company due to risk of potential loses on sales, profit and customer loyalty. Worsening the situation was failure of the company to anticipate higher sales during end of third quarter and the first two months of the fourth quarter. Bizarrely and perhaps unfortunately, a highest actual sale of 114,735 units was recorded during October but forecasted sales were only 48,025 units.

Table 2: Comparison Between Actual and Forecasted Sales For The Year 2000 (Elbows)

Elbows STD/S40	Jan	Feb	Mac	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Actual Sales	11528	34801	19090	5700	7404	6229	7043	36780	28539	114735	45563	7044
Forecasted Sales	26775	26775	26775	26775	36975	36975	36975	36975	48025	48025	48025	48025
Total (Differences)	15247	-8026	7685	21075	29571	30746	29932	195	19486	-66710	2462	40981

Referring to table 2, obviously throughout the year 2000 (except February and October), company's sales performance was extremely not very good, thus proving that forecasting activities must also consider other influential factors such as recent economic downturn and market trends. Despite being proactive and optimistic, ALSB top management should also realize the crucial impact of economic recession towards forecasting activity. Crucially, due to long lead-time of material delivery, sales forecast played a major role in determining company's total production output. In other word, the factory will produce both elbows and reducers earlier than expected date of customers' requirement exactly based upon the sales forecast.

In terms of actual sales of all sizes, smaller sizes of elbows ranging from ½ inch to 2 inches have recorded higher sales as compared to larger size such as 2 ½ inch, 3 inches and 4 inches. As shown in figure 1, highest sale was recorded by 1 ¼ inch elbows (99270 units) followed by 1 inch (55489 units), ¾ inch (39993 units), 1 ½ inch (37331 units) and ½ inch (28355 units). Nonetheless, lower sales have been achieved for larger size of elbows with 4 inch recorded lowest sale (8240 units) followed by 2 ½ inch (16760 units), 3 inch (18531 units) and 2 inch (20487 units).
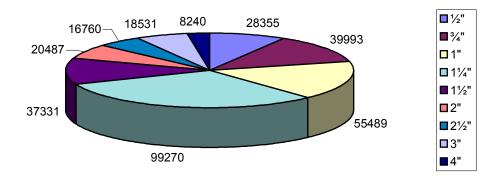
Figure 1: For Each Size Of Elbows For The Year 2000

In terms of percentage, 1 ¼ inch elbows has dominated company's sales throughout the year 2000 with 30% of the total sales, while lowest sale was recorded by 4-inch elbows (3%). More importantly, four sizes of elbows (3/4 inch, 1 inch, 1¼ inch and 1½ inch), which are small and medium size of elbows, have contributed a remarkable 71% of the total market share! Obviously, that statistics shows the importance role of the small and medium size of elbows. Figure 2 shows sales for each size of elbows in terms of percentage.
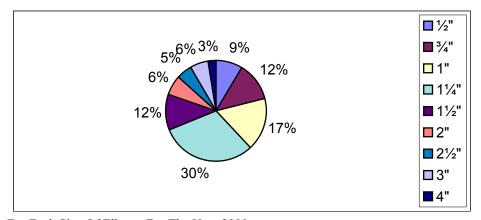
Figure.2: Sales For Each Size Of Elbows For The Year 2000

Performance measurement of Reducers: forecasted VS actual sales

In terms of forecasting, total forecasted sales for the year 2001 are 139,050 units, which shows 15% increase from previous year sale forecast (119,469 units). Almost similar to the elbows, medium size elbows were expected to contribute major sales compared to larger size of elbows. Highest sales are projected for 2 inches reducer with a total amount of 34 425 pieces in the year 2000, followed by 40 500 pieces in 2001. On the other hand, lowest sales are anticipated for 4 inches reducer with a total of 4040 pieces in the year 2000 and 4750 pieces in 2001. Beside that, it is also obvious based upon figure 3 that higher sales are anticipated for medium size of reducer while lower sales are projected for larger size of the product. The following figures 3 and 4 shows sales forecast in terms of quantity for each size of reducer throughout the year 2000 and 2001.
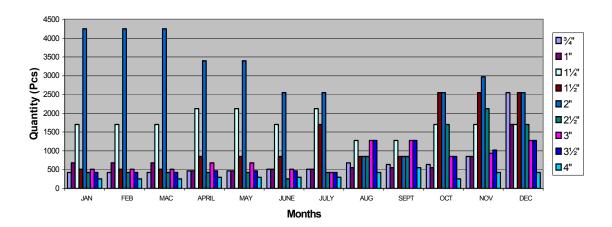
Figure .3: Sales Forecast For Each Size of Reducer In The Year 2000
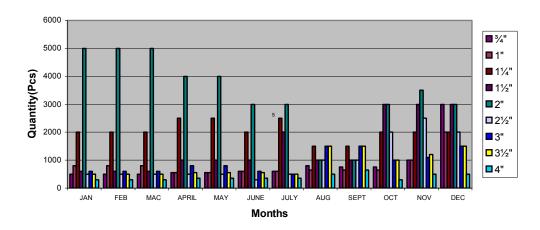
Figure 4: Sales Forecast For Each Size of Reducer In The year 2001

As mentioned earlier, the basic fundamental behind the consistent increase of the company's sale forecast is based upon the 15% growth targeted by the top management. Meanwhile, simultaneously the medium and small range of reducers are projected to generate more sales than larger sizes such as 3 inches and 4 inches reducers. In the mean time, out of 12-months, only during January, September and October the company have recorded better sales, whereby actual sales were exceeding forecasted sales. However, other months especially March and December have shown below-par sales performance for the company whereas actual sales were very low compared to the forecasted sales. The following table 4.2 shows the comparison between company's sales forecast and the actual sales of reducers for the year 2000.

Table 3: Comparison Between Actual and Forecasted Sales For The Year 2000

Reducers STD	Jan	Feb	Mac	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Actual Sales	16017	1823	130	4745	2324	1741	2929	5249	8667	12370	11513	4157
Forecasted Sales	9180	9180	9180	9180	9180	7650	8968	8033	8118	11645	13430	15725
Total (Differences)	-6837	7357	9050	4435	6856	5909	6039	2784	-549	-725	1917	11568

Referring to table 3, lowest sale has been recorded during March with a surprising achievement of only 130 units while highest sale was achieved on January with an impressive sale of 16,017 units. Generally, higher sales were also achieved on September (8667 units), October (12,370 units) and November (11,513 units). However, the company expected higher sales for the month of November compared to the actual sales performance recorded on that month. In terms of actual sales for each size, surprisingly higher sales have been achieved through 3-inch and 4-inch reducers, thus defying early projection that small-medium size of reducers will generate more sales than the larger ones. In fact, roughly about 43.8% of total sales of reducers were coming from a combination of both 3 and 4-inches reducers. Nonetheless, not all larger size of reducer generating higher revenue as sales for 3 ½ inch reducer was bizarrely very low, notching only 0.07% from the total actual sales. Apart from those larger sizes, ¾ inch reducer has recorded a significant 10.3% portion from the total actual sales, 10.2% from 2-inch, 9.7% from 1-inch, 9.72% from 2 ½ inch, 9.2% from 1 ¼ inch, and 7% from 1 ½ inch reducers. Total actual sales of reducers for the year of 2000 were altogether 71,661 units, a considerable disappointing achievement compared to earlier projection of 119,469 units.

Proposing the best forecasting method: Comparative analysis of the proposed methods

Comparison between suggested methods will be carried out based upon the comparative value of the errors (Mean Absolute Deviation and Mean Square Error) in order to choose the best forecasting method for the company. Prior to the comparative analysis of MAD and MSE, analysis of all the proposed methods was carried out using a computer software known as Quantitative Management (QM) for Windows 92/98. Note that in each of the suggested methods, the best possible result based on certain factors such as basis for smoothing (decomposition methods) has been considered in order to obtain the lowest value of MAD and MSE. For instance, sometimes we have to use the average of all data instead of centered moving average as our basis for smoothing as it generate lower error (MAD and MSE). In other words, we have to be more flexible in implementing the forecasting method into practice. In the mean time, we cannot totally depending on the comparative value of MAD and MSE due to the fact that certain methods such as moving averages and exponential smoothing are just not appropriate for observed data that contain seasonal factors. However, the inclusion of both methods (moving average and exponential smoothing) as one of the suggested methods are for the purpose of comparison and as a stepping stone for the company for future application of quantitative forecasting method. Table 4.3 and 4.4 shows the comparison between the suggested forecasting methods for Elbows and Reducers respectively.

Table 5: Comparative Summary of MAD And MSE For Elbows Using Four Different Type of Forecasting Methods

SIZE/METHODS		MOVING AVERAGE	EXPONENTIAL SMOOTHING	MULTIPLICATIVE DECOMPOSITION	ADDITIVE DECOMPOSITION
½	MAD	3045	3056	3224	3410
	MSE	13768831	30013293	20846450	18948772
¾	MAD	4061	3257	1949	2317
	MSE	30111221	26016950	6667547	8835785
1	MAD	4332	4161	2813	2787
	MSE	28052440	24475163	10154540	11722815
1 ¼	MAD	11697	9186	11136	11284
	MSE	5.41E+08	4.22E+08	268295376	264200144
1 ½	MAD	5120	3429	2967	3506
	MSE	41513011	33349169	19043786	19519144
2	MAD	2081	1643	1570	1566
	MSE	8436449	6340070	4037797	4004635
2 ½	MAD	1063	1313	902	973
	MSE	2949383	3652556	1712821	1356488
3	MAD	3015	1502	1515	1926
	MSE	22368565	14190361	9386247	9248307
4	MAD	581	668	532	552
	MSE	546988	753896	371446	369309

Based upon table 5 and 6, it is noticeable that the multiplicative and additive decomposition methods are performing better in almost every size of both elbows and reducers than the moving average and simple exponential methods. For Elbows, the multiplicative decomposition method has generate four lowest value of MAD and three lowest value of MSE, while the additive decomposition method has come up with two lowest value of MAD and five lowest value of MSE. In the mean time, the simple exponential method has only produce two lowest value of MAD (1 ¼ inch and 3 Inches), while the moving average has obtained only one lowest value of MAD and MSE (½ inch). However, though the simple exponential smoothing method has generate two lowest value of MAD, we cannot easily jump into the final conclusion to choose this method for 1 ¼ Inch and 3 Inches Elbows due to the fact that it does not generate the lowest value of MSE, which is more important. According to Makridakis, Wheelwright and Hyndman (1998), the MAE or MSE are more useful measures and performance indicator than mean error.

Beside that, it is also apparent that due to seasonality factors that exist within the observed data (actual sales data for the year 2000), the forecasting methods (multiplicative and additive decomposition) that specifically have been developed to deal with seasonal data are proven to be more accurate than forecasting methods (moving average and simple exponential smoothing) that have been designed to forecast stationary data. This judgement is based upon the comparison of errors' value, especially the Mean Square Error (MSE). Meanwhile, it is more obvious that decomposition methods are superior to the moving average and simple exponential smoothing method in the analysis of Reducers. Out of nine different sizes, the multiplicative decomposition method has generated three lowest value of MAD and one lowest value of MSE. At the same time, the additive decomposition method has performed even better by notching four lowest value of MAD and six lowest value of MSE. On the other hand, the simple exponential smoothing has only managed to come up with one lowest value of MAD, while the moving average has achieved only two lowest values of MAD and MSE. The result has provided evidence to us that for seasonal observed data, the suitable methods are the multiplicative and additive decomposition methods. Nevertheless, perhaps we can apply the moving average method to forecast ¾ inch and 1 ¼ inch Reducers since the method has generated lowest value of both MAD and MSE.

Table 6: Comparative Summary of MAD And MSE For Reducers Using Four Different Type of Forecasting Methods

SIZE/METHODS		MOVING AVERAGE	EXPONENTIAL SMOOTHING	MULTIPLICATIVE DECOMPOSITION	ADDITIVE DECOMPOSITION
¾	MAD	368	780	926	1097
	MSE	570489	3656634	2375351	2268537
1	MAD	534	620	499	480
	MSE	494127	870057	674038	4441150
1 ¼	MAD	529	712	615	631
	MSE	432475	987114	611886	605835
1 ½	MAD	502	399	402	394
	MSE	513307	337936	250697	246056
2	MAD	734	732	484	533
	MSE	1502423	1299913	717809	633301
2 ½	MAD	561	728	357	351
	MSE	854251	1025440	360457	305510
3	MAD	1225	953	847	892
	MSE	2077122	1837053	1149980	1286703
3 ½	MAD	9	6	-	6
	MSE	154	111	-	63
4	MAD	852	794	510	620
	MSE	1028330	1067685	438530	467740

DISCUSSION AND RECOMMENDATION

Realistically, there are many factors or obstacles that could more or less, affect the outcome of the chosen forecasting method. Even though we have a very good quantitative forecasting method, it does not mean that we are going to achieve better and accurate sales forecast due to the fact that business is always expose to outside factors such as economic condition, political stability, technological changes, and competitors action. Therefore, we cannot depend totally on the quantitative forecasting method to develop future sales forecast. In other words, perhaps the best way to overcome the shortcomings is by combining the quantitative forecasting method (time-series) with the qualitative approach (judgemental method). After all, it is important to get input and advice from the top management regarding current economic condition and other influential factors such as competitors' action before developing final sales forecast.

An apparent example of this issue is about how to develop a sale forecast for 3 ½ inch standard Reducers, whereby past year's sale was very low (50 pieces). Of course we cannot just simply forecast only 22 pieces of 3 ½ inch standard Reducers will be sold based upon the multiplicative decomposition method. Definitely it is not viable! But there is nothing wrong with the method (multiplicative forecasting method). Therefore, on certain situation, it is best to apply human judgement and top management target (sales growth) alongside quantitative method to develop better sales forecast. In terms of the quantitative methods alone, priority should be given to any method in which producing lowest MAD or MSE because of its minimal number of forecast error. In the longer term, consideration should also be given to other more advanced quantitative methods supported by the application of certain forecasting software in order to enhance company's forecasting performance.

The summaries of recommendations based upon results of the comparative analysis between suggested forecasting methods are as follows:

- *Adopt the multiplicative decomposition method to develop sales forecast for standard Elbows (excluding ½ inch elbows), and the additive decomposition method for standard Reducers (except for ¾ and 1 ¼ inch Reducers).*
- *Choose the moving average method to develop sales forecast for ¾ inch and 1 ¼ inch standard Reducers, and ½ inch Elbows.*
- *Using forecasting software such as QM (quantitative management) for Windows 95/98, Excel QM, SPSS, Minitab, and SAS to assist management in the development of a better sale forecast.*
- *Focus on short and medium range forecast as a starting point.*

- *If applying more than one scientific time-series methods are quite complicated and inconvenience, perhaps the management can opt for the Multiplicative Decomposition method, or the Additive Decomposition method (less popular but more accurate in this case).*
- *Combining quantitative forecasting method (time-series) with qualitative approach (judgemental forecasting method).*
- *External business factors such as the economic condition, competitors' action, and market growth should also be seriously considered when developing the sales forecast.*
- *Extending the analysis for potential application of a more advanced quantitative forecasting methods such the Box-Jenkins seasonal models, and Holt-Winters method.*

REFERENCES

Arnold, Tony J.R., and Chapman, Stephen N., (2001). Introduction to material management, 4th edition, Prentice-Hall, New Jersey.

Gaynor, Patricia E., and Kirkpatrick, Rickey C., (1994), Introduction to time series modeling and forecasting in business and economics, McGraw-Hill, New York.

Hanke, John E., and Reitsch, Arthur G., (1998), Business Forecasting, 6th edition, Prentice-Hall, New Jersey.

Makridakis, Spyros., Wheelwright, Steven C., and Hyndman, Rob J., (1998), Forecasting: Methods and application, 3rd edition, John Wiley & sons, New York.

Render, Barry., and Heizer, Jay., (2004), Operations Management, 7th edition, Prentice-Hall, New Jersey.

Sanders, Nada R., (1995). Managing the forecasting function. Industrial Management & Data Systems, Vol 95 No.4.

Smith III, Henry C., Herbig, Paul., Milewicz., and Golden, James E., (1996). Differences in forecasting behaviour between large and small firms. Journal of Marketing Practice: Applied Marketing Science, Vol 2 No.1.

Chase, Richard B., Aquilano, Nicholas J., and Jacobs, F.Robert., (2001), Operations management for competitive advantage, 9th edition, McGraw-Hill, Boston.

Nahmias, Steven., (1997), Production and operation analysis, 3rd edition, McGraw-Hill, Chicago.

Silver, Edward A., Pyke, David F., and Peterson, Rein., (1998), Inventory management and production planning and scheduling, 3rd edition, John Wiley & sons, New York.

Stevenson, William J., (2002), Operations Management, 7th edition, McGRaw-Hill, New York.

Industry Concentration and Competition: Malaysian Cases

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ABSTRACT

Liberalization at a practical level is deemed to bring about more or less free trade with respect to manufacturing and capital movements between leading industrial countries and the lesser developed ones. This is with the expectation that there will be an improved economics performance through competition. Such changes are foreseeable to be affecting the current structure of many industries. Driven by these circumstances, the identification of these factors is crucial to effective policy making in order to face market liberalization and enhance competitiveness in global arena. An econometrics analysis employing ordinary least square method was conducted to determine the factors influence the change in and levels of industrial concentration using a sample of Malaysian manufacturing industries.

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INTRODUCTION

Of late, much attention has been given to industry market structure and their relationship with market power. The effects of market integration- now known as globalization- and advanced in technology, and policy intervention by government has changed the trend in industrial structure in developing countries and industrialized countries. Market structure refers to the number and size distribution of firms in the economy, and barriers to entry, and product differentiation. While, conduct refers to pricing behaviour, product strategy and advertising, and research and innovation. Finally, performance refers to production and allocative efficiency, the economic equi-distribution of profits among firms and firms' progress. Henceforth structure and conduct are related to how the market functions within the limits of its basic conditions, whereas performance relates to how well it functions.

As mentioned above, there is strong relationship within structure-conduct-performance (SCP) of the firm and market power. Greer (1992) defined market power as the ability to influence market price and/or to subdue rivals. According to the basic theory of market structure, higher concentration will increase firms profit following higher price thus, market power. Empirical studies commonly reveals the association of profit and market concentration due to the 'ability' of firms to influence price levels. In other word, the more concentrated an industry, the more it approaches the monopolistic situation and the higher the price-cost margin or profits.

The level of its concentration can characterize markets. The more concentrated an industry, the more it approaches the monopolistic. From previous studies, market concentration has three dimensions that are the number of firms, their relative share in the market and the viability of collusion by the leading firms. There are a number of concentration measures, which, will be discussed further, in the following chapters. There have been studies done in the industrialized countries and developing countries on the market structure in the manufacturing sector. Most of the studies show the important trend in concentration as being an indicator the competitiveness of the manufacturing sector in these countries. Hence, the manufacturing sector is expected to offer better prospects for export earnings and thus a more rapid productivity growth and expansion of production, towards for greater price stability.

In addition, for the period of 1980-1998, it was found that 20 most dynamic products in the world trade were traded. Most of which fall into four categories, that is electronic and electrical goods (SITC 75, 76, 77); textiles and labour-intensive products, particularly clothing (SITC 61, 65, 84); finished products from industries that require high research and development (R&D) expenditures and are characterized by high technological complexity and/or economies of scale (SITC 5, 87); and primary commodities including silk, non-alcoholic beverages and cereals (SITC 261, 111, 084).

In the industrialized countries like the United Kingdom (UK) and United States (US), much attention has been given to the evolving market structure. A few studies have been shown the determination of the trend towards

market concentration in both UK and US. For instance, Pryor (2001) concluded that market concentration for the U.S. industries increased from 1982 to 1999, with consideration the factors increased in globalization recent changes in information technology, and the rise of e-commerce. In addition his studies, Pryor found that the merger wave in the U.S was significant in determining the changes in industrial concentration. He concludes that the government can influence the industry concentration by allowing various horizontal mergers. Such situation has also taken place in Malaysia where the government ongoing policy to encourages mergers and acquisition, for instance in the banking sector and insurance industries.

Issues in efficiency, productivity and for enhancing the competitiveness of Malaysia's manufacturing industries would be a useful undertaking. Whether the industrial market structure would encourage greater efficiency, productivity and competitiveness has hardly been raised at all. It can influence the nature of competition in manufacturing industries. Neoclassical analysis traditionally shows that monopoly leads to an inferior allocation of resources by restricting output below the competitive level. An optimal allocation of current resources requires output to be increased until the marginal benefit derived by consumer's equals the marginal cost of production. It is argued that this level of output will not be attained because the monopolist maximizes profit by equating marginal cost with marginal revenue. The result is a reduction in consumer surplus and a deadweight loss of welfare to society.

On the other hand, competition encourages efficiency by allowing the most efficient firms to survive and grow the expense of their inefficient counterparts. Furthermore, competition is often seen as a spur to economic efficiency as firms pursue and adopts innovations in order to gain a competitive advantage. Some economists have argued that competitive market structures will increase consumer choice and welfare. Under the Structure-Conduct-Performance (SCP) approach, a good structure was defined in terms of perfect competition. This approach focused on the performance of industries, and suggested aspects of structure and conducts that could be adjusted to bring about desirable performance outcomes. In other words, competition defines good performance, and then finds the appropriate industry structure to ensure such performance.

Since then, research in this area has mushroomed. Motivated by this scenario, this paper focuses on market structure and industry concentration in Malaysia. Perhaps, it may be useful to investigate whether competition has indeed increased overtime. We intend to carry out this investigation by looking at changes in, and determinants of, industry concentration, which is considered as the simplest measure of market power. The general objective of this study is to empirically examine the significance of the determinants industry concentration in Malaysia. This would be achieved by the following specific objectives: firstly, to set up a concentration model for industries based on the hypothesis that entry of foreign firms will encourage merger and hence concentration of the local industries secondly to organize an econometric analysis on the determinants of industry concentration in Malaysia and thirdly to examine the policy implication and make recommendation.

The paper is organized as follows. The second section reviews existing literature on the market structures and the determinants of changes in, and levels of, industry concentration. The theoretical models for industry concentration are described in section three and inadditions discusses the empirical or statistical method to be applied in the examination of the determinants. This is then followed by discussions on the results of the empirical analysis in that section four. Summary, policy implications and recommendation plus future research are included in section five.

INDICES TO MEASUREMENT OF CONCENTRATION AND THE DATA

Researcher and policy-makers use various concentration indices to capture industry structure. The extent to which industries are concentrated provides useful information on the extent and nature of competitive forces acting upon firms in a particular industry at any given time. For the purpose of our study we use the concentration ratio and Herfindahl index to measures of concentration.

The most commonly used of all indices is the *K*-firm concentration ratio, defined as the cumulative share of the *Kth* firm. More formally, using *si* to denote the share of the *ith* firm;

$$CRK = \sum_{i=1}^{K} si \qquad (1)$$

where   *CRK*   = the *Kith* firm concentration ratio
          Si   = the percentage market share of the *ith* firm

It is the percentage of market sales (or some other measure of size, such as assets, employment, or value added) accounted for by an absolute number of the largest firms in the market- for example, the 4 or 8 or 20 largest firms.

Another popular index is called H index, so named for its inventors Orris Herfindahl and Albert Hirschman. Defined as the sum of the squared values of firms; shares. The 'paternity' of the index is disputed. It satisfies all of the Hannah and Kay axioms. In mathematical notation:

$$\text{H index} = \sum_i (Si)^2 \quad (i = 1, 2, 3, \ldots., n) \tag{2}$$

> where S presented the percentage share of individual firm i and
> n is the number of firms in the market.

Although most of these measures have their limitations they normally tend to correlate highly with one another (Davies, 1979, Kwoka, 1981). But here we are not intending to discuss the limitation of the measured. As Curry and George stated that, the complexity of business life is such that in practice it is unlikely that there is one concentration measure which will clearly be superior in all circumstances. Here we calculated H index based on output.

For the purpose of analyzing the causes of industry concentration in Malaysia, we specify the following model, which introduced by Ratnayake (1999) to determinants the industry concentration in New Zealand.

$$Cj = \alpha + \sum \beta i \, Xij + \sum \gamma i \, Yij + \delta i \, Zij + \mu, \tag{3}$$

> where Cj is a measure of concentration in industry j,
> > Xij is a vector of technical causes and market condition affecting concentration
> > Yij is a vector of variables representing international influences
> > Zij is a vector of government policy related variables and
> > μ is an error term.

The dependent variable to determinants industry concentration cover a period of one year within 103 5-digit level of industry was concentration ratio in particular industry (Cj). As the data to construct the value of concentration ratio provided by Department of Statistics, is only available for output to measure the ratio. The reasons for this choice stems from the fact that market concentration are the proportion of an industry's total assets, sales or employment that is controlled by its largest firms. Traditional industrial organization literature suggests a number of systematic factors can cause industries to be dominated by a few largest firms.

First, concentration is hypothesized to be partly determined by barriers to entry (Xij). Barriers to entry, by making it difficult for new firms to enter the industry, tend to encourage the growth of monopolistic or highly oligopolistic market structures. Barriers to entry include economies of scale, absolute cost barrier, and high degree of technical intensiveness of an industry, high capital intensity and advertising expenses. Empirical evidence on the determinants of entry suggests that entry is higher in profitable industries or in industries enjoying high average growth rates (Baldwin and Gorecki, 1987; Geroski, 1991a,b). Caves (1998) found that entry and exit affects levels of industry concentration depend crucially on the association between barriers to entry. Here, we use a measure of economies of scale variable (ES), capital intensity (PCI) and advertising intensity (A/S), respectively, to present these three types of barriers to entry.

Referred to minimum efficient firm size at which all the advantages of scale can be varies according to the industry and the higher this minimum efficient size is relative to the market size, the harder it will be for firms to enter the industry. Several methods have been proposed to test for the existence of economies of scale. Ratnayake measured ES as the value added per person of the class containing the 50th percentile of industry value added divided by the total value added per person of the industry. We can expect a positive relationship between scale economies and market concentration. For the purposed of this study, we employ minimum efficient scale (MES) as a proxy to economies of scale that was initially proposed by Comanor and Wilson (1967) and later used in other studies including Rugayah (1992), Gan (1978), Yusof and Phang (1994), and Nor Ghani et al. (2000). The proxy is calculated as the average size of the largest plants that account for at least 50 per cent of total industry output. It is equal to $\sum_{i=1}^{m} Xi / m$ where Xi is total output of firm i and m is minimum

number of firms accounting for at least 50 per cent of total output.

Capital intensity (PCI) computed as the book value of fixed capital divided by number of employees. High capital intensity may make entry difficult because not many firms can raise sufficient capital in order to enter the industry at a sufficient scale to be able to compete effectively and earn profits, which are commensurate with the risk and cost involved. Hence capital intensity is expected to have a positive relationship with market concentration.

Industry size (SIZE) which, represented by the industry's domestic sales, expected to be inversely related to concentration. Larger markets naturally support larger numbers of firms. As a consequence, concentration levels will tend to be lower in large markets, especially if the minimum efficient scale is small relative to industry size. Recent research has emphasized the importance of the links between markets size and concentration. Sutton (1991) defined two main industry types, now commonly referred to as Type 1 and Type 2. In Type 1 industries, the size distribution of firms is determined by exogenous factors such as the state of technology, while Type 2 industries endogenous factors embodied in the strategic behaviour of firms determine the concentration levels observed. Here, industry size is represented in the model by the value of sales.

Firms that can successfully differentiate their products, gain market share and raise barriers to entry will prevent new competition. This is likely to lead to high levels of industry concentration. Mueller and Rodgers (1980) updated earlier work by examining the relationship between advertising and concentration in US manufacturing industry over the period 1947 to 1972. They found a positive relationship between advertising expenditure and changes in concentration. This advertising intensity (A/S) is defined as the ratio of advertising expenditure to the value of sales. We expected advertising inverse relationship with concentration.

Foreign firms, especially TNCs (Transnational Corporations) can do provide a powerful stimulus to market concentration partly because TNCs change parameters by virtue of the special advantages that they have over local firms in term of their size, technology ability, command of various resources and difference in organizational structure, and partly because of their conduct, namely, their more aggressive approach in lobbying policy makers and in affecting takeovers and mergers and challenging locals norms in industry (Lall, 1979, pp.328). There are two competing hypotheses regarding the likely effect of FDI on industry concentration. The first is that foreign firms are able to breakdown local oligopolies and widen the scope for competition by increasing the number of firms in the industry. This possible because foreign firms have intangible assets such as technology, product development skills, and research and marketing skills to overcome the difficulties which might deter domestic firms from entry (Caves et al., 1980, p. 53). The second hypotheses which runs counter to the above states that foreign entry might result in mergers and bankruptcies among local firms and thus raise seller concentration in local industries. Foreign ownership (FOI) of industry computed as the share of sales owned or controlled by foreign firms.

Based on the above explanations, in order to test the hypotheses discussed above, we estimate the following equation using explanatory variables in both levels and differences form.

$$C_t = \alpha + ES + \Delta PCI + \Delta A/S + FOI + \Delta SIZE_t + \mu, \qquad (4)$$

where, t denotes period of time : 1986-1990. Ideally, one should have used all explanatory variables in difference from rather than level form. However, we were able to obtain data in difference form for three important variable as well as PCI, A/S and SIZE.

The success of econometric analysis ultimately depends on the availability of the appropriate data. As we discussed in Section 2, previous studies has utilized the data using annual data at the Malaysia Standard Industrial Classification 5-digit level from the Department of Statistics. For the purposed of our study, we obtained the data from the Department of Statistics over the period of 1986 and 1990. The industry consists of 137 industries at the 5-digit level of MSIC. From these samples, 34 industries were eliminated due to unavailable information of CR4, Herfindahl index, sales or fixed assets. This leaves us with 103 industries at the 5-digit level of MSIC in the sample.

Following to the discussion in this early section we measures of concentration both with 4-firm concentration ratio and Herfindahl index. However, we use only the 4-firm concentration ratio in our analysis on patterns and trends, as they are fairly easily understood indices of market power. The econometric analysis with Ordinary Least Square (OLS) method was carried out using cross-sectional data for 103 industries.

PATTERN AND TRENDS IN CONCENTRATION

Concentration ratio and Herfindahl index for Malaysia manufacturing industries over two years (1986 and 1990) are presented in Table A1 in Appendix. By looking at column three Table 4.1, which summarizes 4-firm concentration ratio for 1990, one can observe that on average the four largest firms account for about 61.73 per cent of the total output of industries. It can be seen that instances of very low concentration are relatively rare in Malaysia manufacturing industries. There have 4 industries which concentration ratio below 15 per cent such as large rice mills (31162), sawmills (33111), furniture and fixtures, except primarily have metal (33200) and rubber remilling and rubber latex processing (35591). At the opposite extreme, 21 out of 103 industries have 4-firm concentration ratio greater than 91 per cent. Another 15 industries have concentration levels between 76 and 90 per cent.

The number of highly concentrated industries for instances those lying in the range 76 to 100 per cent decrease 44 from 1986 to 36 in 1990. The number of industries with less than 30 per cent concentration ratio declined slightly from 16 in 1986 to 13 in 1990. The largest increase in term of 4-firm concentration ratio, has been for industries where 61 per cent $\leq$ CR4 < 75 per cent; the number of industries in this range has increased by 100 per cent from 8 in 1986 to 17 in 1990. By international standards, and industry is considered oligopolistic if CR4 reaches 40 per cent. Using this criterion, Table 4.1 shows that the number of industries, which can be considered oligopolistic, has risen from 81 industries (79 per cent of sample size) in 1986 to 85 industries (83 per cent of sample size) in 1990.

Table 4.1: Frequency Distribution of Concentration ratios by industries in 1986 and 1990

4-firm concentration ratio	Number of 5-digit industries	
	1986	1990
0-15	4	3
16-30	12	10
31-45	11	16
46-60	24	21
61-75	8	17
76-90	19	15
91-100	25	21
Median	63.18	61.07
Mean	65.01	61.73
Standard deviation	26.64	25.38

Source: Prepared using data from Department of Statistics.

Most highly and lowly concentrated are given in Table 4.2. Pineapple canning, handicrafts spinning and weaving has the highest concentration ratio which is followed by sugar factories and refineries (99.54 per cent), tobacco manufactures (96.85 per cent), and manufacture of footwear except moulded rubber or plastic (88.01 per cent). At present there are 26 firms in tobacco while in 1986 there were 20 in this industry. The number of firms in the tyre and tube industries decreased from 62 in 1986 to 58 in 1990. This industry consists a few larger firms and a large number of small firms. As expected, a notable feature of these highly concentrated industries is that they are controlled by a few large firms and have high entry barriers in some form such as capital requirements (pineapple canning) and brand names (tobacco).

The industries with very low levels of concentration are furniture and fixtures (15 per cent), bakeries (17.67 per cent), manufacture of pulp, paper and paperboard articles (21.17 per cent), rubber remilling and rubber latex processing (14.1 per cent), and sawmills (9.15 per cent). All these industries have many small firms, which is consistent with a low level of concentration. For instance, there are 289 firms in bakeries industries, 507 firms in furniture and fixtures, 104 in cement and concrete products and 166 in planning mills, window and door mills and joinery works, 486 in sawmills and 119 in large rice mills.

Table 4.2: Industry concentration by selected of industry groups 1990-1991.

Concentration ratio (CR) ≥60			Concentration ratio (CR) ≤40		
5-digit level industry	4-firm CR-output	Number of firms	5-digit level industry	4-firm CR-output	Number of Firms
31131 Pineapple canning	100	4	31172 Bakeries	17.67	289
31180 Sugar factories and refineries	99.54	7	32130 Knitting mill	34.32	86
31400 Tobacco manufactures	96.85	29	31211 Ice factories	20.99	64
32190 Manufacture of textiles, n.e.c	98.32	6	31220 Manufacture of prepared animals	28.16	66
32400 Manufacture of footwear except or moulded rubber or plastic	88.01	26	33113 Planning mills, window and door mills and joinery works	24.84	166
35231 Manufacture of soap and cleaning preparation	79.15	20	33200 Manufacture of furniture and fixtures, except primarily of metal	15.82	507
35510 Tyre and tube industries	73.26	58	36991 Cement and concrete products	31.12	104
38410 Shipbuilding and boat-building and repairing	70.82	83	38192 Manufacture of wire and wire products	36.53	77
35210 Manufacture of paints, varnishes and lacquers	66.37	27	38439 Manufacture of motor vehicle parts and accessories	38.23	94
38310 Manufacture of electrical industrial machinery and apparatus	60.27	68	34120 Manufacture of pulp, paper and paperboard articles, n.e.c.	21.17	91

*4-firm concentration ratio by output

Source: Prepared using data from Department of Statistics

Compared on an international level where 4 firms accounting for less than 20 per cent of total industries output is considered competitive (Bain, 1951), then Malaysia's manufacturing sector is most definitely highly oligopolistic and non-competitive because only 4 out of 103 industries in 1986 and 3 out of 103 industries in 1990 had CR4 less than 20.0 per cent. These industries, which can be considered competitive, are large rice mills (31162), sawmills (33111), rubber remilling (35591), and furniture and fixtures (33200). Pryor (1972) found that that concentration in all 12 nations studied was highest among the tobacco, transport equipment, machinery and petroleum and coal products and lowest the furniture, lumber products and clothing industries.

High concentration in Malaysia may be attributed to many factors. According to Ratnayake (1999), the long-standing high protection must have enlarged the share of the domestic market held by domestic firms by reducing the intensity of international competition. In the case of Malaysia, it was only in the lately 1990s that Malaysia began to liberalize its foreign trade. Secondly, the relatively small size of the domestic market and the need for firms to be large to gain the benefits of economies of scale could another reason for high concentration in Malaysia. Finally, the absence of any affective antitrust legislation must have contributed to increased concentration previously.

Following to the trends in concentration, Table 4.1 summarizes the 4-firm concentration ratios at the industry level for two years. There is clearly a declining trend in the levels of concentration over the period under consideration. This is reflected in all measure of central tendency (median, means and standard deviation). The number of industries with more than 76 per cent concentration decreased from 47 to 36 percent over the same period.

Ratnayake (1999) argued, to examine the trends in competition over time, all industries have been classified into three groups based on the 4-firm concentration ratio: non-competitive industries, competitive industries, and semi-competitive industries. The non-competitive group is defined as the industries, which have concentration ratios greater than or equal to 60 per cent. The competitive group consists of industries with less than 40 per cent concentration ratios. Industries with a concentration ratio between 40 to 59 per cent were classified as semi-competitive. The percentage of output (data of sales not available) accounted for by these two groups in 1986 and 1990 is presented in Table 4.3.

Table 4.3: Trends in competition

Year	Non-competitive industries		Competitive industries		Semi-competitive industries		
	No. of firms	Percent of output	No. of firms	Percent of output	No. of firms	Percent of output	
1986	56	54.37	20	19.42	27		26.21
1990	51	49.51	23	22.33	29		28.16

Source: Prepared using data from Department of Statistics

By comparing with the Ratnayake (1999) in the Malaysia case, we found that, there has been a marginal decrease in the percentage of output accounted for by non-competitive firms over the period. On the other hand, the share of output accounted for by competitive industries has dramatically increased over the period under consideration. This increase, however, has taken place at the expense of non-competitive firms rather than at the expense of semi-competitive firms. These numbers imply that competition in Malaysia manufacturing has increased overtime. This result likely similar to the study by Ratnayake which he found that competition in New Zealand manufacturing has increased over time. This means that our finding is consistent with findings of previous studies (Shepherd, 1982; Ratnayake, 1999; Nor Ghani et al., 2000; Pryor, 2001).

The above analysis of patterns and changes in concentration has shown that competition in Malaysia industry has increased over time. In order to see what factors made this possible, we turn next to examine the determinants of changes in, and levels of, industry concentration (Table 4.4 and Table 4.5). Since our focus here is on the changes rather than levels, no further adjustment has been made carried out.

Table 4.4: Determinants of changes in concentration

Independent variable	Dependent variable
	CR_{86-90}
ES	$1.071(17.58)^a$
PCI	$0.026(2.364)^b$
FOI	$0.0901(1.685)^c$
SIZE	$-0.804(-1.007)^b$
A/S	$-0.534(-2.387)^b$
Constant	$0.337(14.02)^a$
F ratio	72.410^a
Adjusted R^2	0.778
RESET[d]	196.55
H. test[e]	0.32905

Notes: t-ratio (two-tail) are given in parentheses.

Significance level: [a]1%, [b]5%, [c]10%.

[d] Ramsey's regression specification test

[e] Breusch-Pagan-Godfrey test

RESULTS-CHANGE IN INDUSTRY CONCENTRATION

The coefficients of all conventional variables (economies of scale, capital intensity and industry size) bear the expected signs and are consistent with findings of previous studies in Malaysia and for other countries (Table 4.4). The economies of scale variable (ES) has the expected sign in equation and is statistically significant at 1 per cent, supporting the widely held view that the small size of the domestic market in Malaysia requires relatively large firms to exploit economies of scale. Our results confirm the findings by Rugayah, Lall, and Yusof and Phang on the importance of scale economies as measured by MES.

The coefficient of capital intensity (PCI) has the expected sign and it is statistically significance at level of 5 per cent. Supporting the hypothesis that capital requirements are important variables to explain barriers to entry. This seem to suggest that high capital-intensity is not necessary for efficiency but it appears to be important for market dominance by firms. Advertising is undertaken to promote brand-consiousness and achieve market exclusivity but there are scale economies in advertising so that it is more worthwhile for large firms rather than small firms to undertake advertising in order to converse its market or keep out new entrants or expand its market size by attracting new customers. However, our findings show that A/S was inverse relationship with concentration. But it was showed significance at the level of 5 per cent.

The results for the industry size variable (SIZE) support the hypothesis that the larger the size of the industry, the higher the possible number of efficient firms, the lower would barriers to entry, and the lower its level of concentration. The estimated coefficient showed at the Table 4.4, -0.804 with CR4. Which, we can see negative relationship with CR4 as well as dependent variable. The foreign ownership (FOI) variable is positive and significant in the equation for 1986-1990, indicating that foreign entry may lead to mergers and bankruptcies among domestic firms, thus raising the degree of concentration in the domestic industry. We found the correlation 0.09 for CR4 and FOI. This could be due to the more important role-played by foreign direct investment in the early and infant years of Malaysia's industrialization effort and local firms tended to be smaller than foreign firms. In Malaysia, this has important repercussions on

industry structure because a substantial share of industry is owned or controlled by foreign firms. For instance, in 14 out of 103 industries at the 5-digit level of MSIC, foreign firms account for 60 per cent or more shares. In some industries, this share is as high as 91 per cent (manufacture and assembly of motor cycles and scooters), 90 per cent (manufacture of photographic and optical goods), and 72 per cent (tobacco). This suggests that foreign presence penetrated the local market and promoted a competition market structure and confirms the hypothesis that foreign entry might result in mergers and bankruptcies among local firms and thus raise seller concentration in local industries.

Table 4.5: Determinants levels of industry concentration-Regression results

Independent variable	Dependent variable	
	Concentration ratio	Herfindahl index
ES	$0.482(32.63)^a$	$4.011(18.78)^a$
PCI	$0.014(0.926)$	$0.026(0.824)$
A/S	$-0.021(-2.184)^b$	$-0.021(-2.658)^a$
SIZE	$-0.011(-1.243)^b$	$-0.079(-2.907)^a$
FOI	$0.013(1.413)^c$	$0.205(1.092)^c$
Constant	$0.637(3.743)^a$	$-3.0306 (-35.45)^a$
F ratio	314.669^a	90.793a
Adjusted R^2	0.9389	0.8149
RESET^d	52.251	90.738
H.test^e	0.06841	0.2624

Notes: t-ratio (two-tail) are given in parentheses.

Significance levels: [a]1%, [b]5%, [c]10%.

[d]Ramsey's regression specification test.

[e]B-P-G heteroscedasticity test.

RESULTS-LEVELS OF CONCENTRATION

Further, we turn to examine the determinants of inter-industry variation of levels of industry concentration. Previous discussion we have used the 4-firm concentration ratio for the analysis of inter-industry variation of changes in industry concentration. Here, we use both the 4-firm concentration ratio and Herfindahl index as the dependent variable in order to explore the sensitivity of results to the choice of measure of concentration.   For analysis the levels of concentration we log the model into functional form in order to solved the heteroscedasticity problem, which exist in our linear model. From Table 4.5 it can be seen that, for most variables, the signs and the level of statistical significance of coefficients are similar to those obtained in the analysis of change in concentration.

The economies of scale (ES) have the expected sign in the equation and are statistically significant at the level of 1 per cent. Then, it would suggest that the leading producers in the industry influence market concentration through the impact of higher capital intensity, foreign presence and advertising. This support the hypothesis that concentration to be partly determined by barriers to entry. Capital intensity (PCI) was expected and it positive relationship with dependent variable CR4 and it coefficient is 0.014. The statistically significant negative coefficient of advertising intensity (A/S) supports the hypothesis that advertising can be a useful way of breaking a monopoly based on imperfect information and expanding the market.

This signs similar to the model with Herfindahl index as dependent variable. Referred to third column Table 4.5, economies of scale (ES), capital intensity (PCI) and size variable (SIZE) as expected and confirm with the study in other countries. In term of foreign ownership (FOI) it has showed that positive sign with Herfindahl index and estimated the coefficient 0.2057. For advertising (A/D) it showed negative

sign with estimated coefficient of –0.2103 Herfindahl index. It just to show the relationship our dependent variable between CR4 and HHI was highly correlated.

The result from analysis changes in and levels of concentration, the equation thus analyzed shows that the signs of the estimated coefficient are consistent with the findings of previous studies (e.g., Henley, 1994; Yusof and Phang, 1994; Ratnayake, 1999). In most existing studies, the authors have focused on determining which factors are more dominance in causing concentration. The difference between those studies and the present is the significant role played by availability of variables. Due to data limitation, we just included five variables out of nine as well as economies of scale, capital intensity, size variable, advertising intensity, and foreign ownership.

CONCLUSION

In summary, our findings showed that the market structure in the manufacturing industry in Malaysia had moved towards a more competitive market. The main factors affecting market concentration may have a different impact on industries, both in terms of direction and strength, depending on whether the industries are producing for final goods or otherwise. Foreign presence, particularly at or beyond the critical level, also is a significant factor, which promotes competition through the use of high capital-technology based, larger scale of production and advertising strategies to differentiating products and creating innovation.

An examination of the determinants of the determinants of concentration has shown that both the level and rate of change in market concentration can be explained by the existence of economies of scale, barriers to entry, strategic behaviour and foreign presence. The econometric results support the hypothesis that economies of scale are a major source of market power in Malaysia. Large firms, which may be in a position of market dominance, are needed to exploit economies of scale and to promote greater efficiency in industries. Based on the empirical findings, we are able to gauge the extent to which certain economic variable determine the change in and level of concentration in Malaysia. These findings can provide some basis for the imposition of policy measures in order to ensure that the market structure is not excessively concentrated and to erode monopolistic practices.

Our analysis has some implications on policy aimed at creating a competitive industrial environment and maximizing consumer welfare. As a consequence, competition policy is necessary to ensure that efficiency is rewarded and consumer welfare is maximized. A report by the Organization for Economic Co-operation and Development (1984) noted that:

> *Competition policy has its central economic goal as the preservation and promotion of the competitive process, a process which encourages efficiency in the production and allocation of goods and services over time, through its effect on innovation and adjustment to technological change, a dynamic process of sustained economic growth.*

An additional factor, which may be taken into account when decisions regarding competition policies are made, is the nature of foreign ownership. Our analysis shows that foreign firms controlled and owned substantial share of industry.

Lastly, this study has been conducted using relatively limited number of independent variables i.e. fives, corresponding to the two period 1986 and 1990. To get the better results, a number of independent variables are preferred. Due to limitation of the data and confidentiality we have excluded the explanatory variable as well as export intensity and import penetration for international trade, nominal rate of protection for government policy and mergers activity. Our results generally indicate that the models are rather satisfactory and acceptable. Therefore, we would recommend above explanatory variables in future endeavor. Another potential area of research is to include economic integration (globalization) and technology changes in the study. Globalization influences the degree to which imports serve to change the degree of competition on domestic market. Even though such factors are not easily quantifiable, dummy variables can serve as proxies.

REFERENCES

Asian Development Bank (2001) Annual Report, Hong Kong: Oxford University Press.

Curry, B. and George, K. (1983). Industrial concentration: A survey. Journal of Industrial Economics, 31, 205-256.

Davidson, R. and Mackinnon, J. G. (1981). Several test for model specification in the presence of Alternative Hypotheses. Econometrics 49, 781-793.

F. Scherer and Ross (1990). Industrial Market Structure and Economic Performance, Houghton Mifflin Company, Princeton.

Greer, Douglas F. (1992). Industrial Organization and Public Policy, Macmillan Publishing Company, New York.

Gujarati, D. N. (1995). Basic Econometrics. 3rd Edition. McGraw-Hill Inc. Singapore.

Gan, W. B. and Tham, S. Y. (1977). Market Structure and Price-Cost Margins in Malaysian Manufacturing Industries. The Developing Economies, 15, 280-292.

Hannah, L. and Kay, J. A. (1977). Concentration in Modern Industry: Theory, Measurement and the U.K Experience, Macmillan, London.

Henley, A. (1994). Industrial deconcentration in UK manufacturing since 1980. Manchester School 62, 40-59.

Malaysia (2000). "Eight Malaysia Plan, 2001-2005". National Printing.

Pryor, F. L. (2001). New Trends in U.S. Industrial Concentration. Review of Industrial Organization, 18, 301-326.

Ratnayake, R. (1999). Industry concentration-profitability relationship and competition policy: is there a critical concentration level?. Applied Economics Letters, 1996, 3, 611-614.

Rugayah Mohamed. (1992). Market Structure, Ownership and Profitability of Firms. Working paper for Institute of Strategic and International Studies-Harvard Institute for International Development Workshop.

Suhaila, A. J. (1996). Capacity Utilisation in the Palm Oil Refinery Industry. Unpublished Ph. D. thesis, Faculty of Economics and Management, Universiti Putra Malaysia.

Schmalensee, R. (1981). Economies of Scale and Barriers to Entry. Journal of Political Economies. 89. 1228-1238.

Shepherd, W.G. (1982). Caused of Increased Competition in the U.S. Economy, 1939-1980. The Review of Economic and Statistics 64,613-626.

Shaked, A. and Sutton, J. (1987). Product differentiation and industrial structure. Journal of Industrial Economics, 36, 131-146.

Tirole, J. (1989). The Theory of Industrial Organization, MIT Press, Cambridge, Massachusetts.

UNCTAD (2002).Developing Countries in World Trade. United Nations publication. New York and Geneva.

White, H. (1982). Maximum likelihood estimation of misspecified models. Econometrica, 50, 1-16.

Wooldridge, J. (1991). On the application of robust, regression-based diagnostics to models of conditional means and conditional variances. Journal of Econometric 45, 5-46.

Yusof, Z. A. and Phang, H. E. (1993a). Industrial Structure in Malaysia, 1979-1990: A Profile. Working paper for Bank Negara Malaysia, 21.

Yusof, Z. A. and Phang, H. E. (1993b). Determinants of Industrial Market Structure in Malaysia: 1979-1990, Bank Negara Malaysia Discussion Paper.

Training And Technical Assistance Programme For The Development Of Small And Medium Enterprise (SMEs):
A Study Of Bumiputera Entrepreneurs In Kedah State Of Malaysia

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ABSTRACT

The issue of 'knowledge based society' in the small business sector in Malaysia has been rising on discussion among the academician and policy maker in emerging economics. Many studies have shown that knowledge and skills plays a vital role for small business development. Furthermore, the government support in term of 'Training and Technical Assistance Program' when dealing with small business can be considered very important for business growth and development. In many countries, the essential and greater important contribution of SMEs for economic development is widely recognized. Since the contribution of the SMEs has been acknowledged, the lack on issues of knowledge and skills of SMEs give a constraint towards achieving success and growth. The purpose of this study therefore to contribute an understanding the importance of training and technical assistance for SMEs development in the state of Kedah, Malaysia. To increase the credibility of this study, a further research on similar issues has been suggested.

INTRODUCTION

Government assistance program and small business sector considered play very important role for economic growth and development. Recently, training and technical assistance program scheme become more important to SMEs from start-up, birth, survival, expansion and growth process. The greater important of training and technical assistance program have been proved by many countries when the government policy has shifted towards 'soft' support such as advice, training assistance and guidance rather than giving subsidies.

For many countries, the government support is widely recognized and become more important for business development especially for small and medium-sized enterprises. For instance, in Australia, the Training on Innovation Ready Program was developed by the government in order to train workers and managers in the use of new technology and adopting innovative approaches. While in Canada, the technical assistance such as Industrial Research Assistance Program was developed in order to assist firms in diagnosing technology needs and in problem solving. (OECD, 2000)

PAPER OBJECTIVES

The objectives of this study:

1. To identify the most important of training programs identified by entrepreneurs.
2. To identify the training programs recently received by entrepreneurs.

3. To identify the most of training program that can enhances entrepreneur's knowledge, skill and innovation process.
4. To identify the most of training program that important for business development.

THE DEFINITION OF SMEs

There are very wide definition of small and medium-sized enterprise which naturally covers a much broader range of business owner. The definitions terms of small and medium enterprises in Asia according country to country by referring the number of employee and amount capital invested or known as turnover. The Malaysian SME authority i.e. SMIDEC (Small Medium-Sized Enterprises Corporation) defined SMEs as industrial based companies with annual sales turnover not exceeding RM 25 million and with full time employees not exceeding 150 persons. Furthermore, the varies definitions of SMEs terms in Asia countries can be summarized thus:

Table 1: Definition of SME According Country

COUNTRY	DEFINITION OF SME	MEASUREMENT
Indonesia	Less than 100 employees	Employment
Japan	Less than 300 employees, or Yen 10 million assets. Wholesaling less than 50 employees and Yen 30 million assets. Retailing less than 50 employees and Yen 10 million assets.	Employment and assets.
Malaysia	Turnover less than RM 25 million and 150 employees.	Employment, shareholder and funds.
Korea	Manufacturing less than 300 employees. Services less than 20 employees.	Employment
Thailand	Less than 200 employees for labor intensive. Less than Bath 100 million for capital intensive.	Employment and capital.
Singapore	Manufacturing less than S$12 million fixed assets. Services less than 100 employees.	Employment and assets.

Source: Hor, 2001

Although the definition of SME differ between countries, but there are one thing mostly common; the vast majority of SMEs are relatively small and most of SMEs in the region employed less than 100 people. So, in this research the researcher used of SMEs definition according to Malaysia country defined.

THE DEVELOPMENT OF SMEs IN MALAYSIA

In Malaysia, SMEs considered the backbone in supporting industries of most economics sector. The government recognized the important roles of SMEs contribution for economic development and employment generation, output and value added and also provide requirement support to bigger firm such as domestic or multinational firm.

Since 1990, Bumiputera are still significantly under represented at the higher level of private sector, corporate ownership and wealth. Over the 20 years period, the New Economic Policy (1970 -1990) target specifically Bumiputera was hold 33% of corporate sector ownership and wealth proved hardest to achieve. Bumiputera ownership share was 20.3% in 1990 and this is fantastic achievement compared to the starting point of 2.4% in 1970. The composition of equity and size establishment of SMEs in Malaysia by the year 2000 as shown below:

Table 2: Size Establishment of SMEs in Malaysia

Status	Total	Size of Establishment	
		Small	Medium
100% Bumiputera	20%	21%	9%
100% Non - Bumiputera	71%	73%	55%
Bumiputera & Non- Bumiputera	3%	2%	11%
Foreigner	6%	3%	23%

Source:Samat, 2000

THE CONTRIBUTION OF SMEs IN MALAYSIA

In Asia, SMEs contribute 35% of direct exports and indirect export where the contribution is much higher, probably closer to 50% for APEC Asian economies (Hall, 2003). In Malaysia, the contribution of business sector started in the late 1960s. During this period, the government realized the need to assist and solving the problems of the businesses, especially those owned by the Bumiputera entrepreneurs.

According to OECD, the contribution of Malaysian SMEs (manufacturing only) to export relatively high with GDP US$ 60,000 million (72%) and share in total exports is 15% (Hall, 2003). The fast growth SMEs contribute to job creation as much as 70% and much longer-term economic dynamism. The SMEs are important in restructuring existing enterprises, generating new enterprises, job creation and creating innovation process in technology for economic development.

TRAINING AND TECHNICAL PROGRAM FOR SMEs DEVELOPMENT

This study will focus on government support on training and technical assistance programs for entrepreneur's and business development. The purpose of this study therefore to contribute an understanding of government support on training and technical assistance program for Bumiputera entrepreneurs in Malaysia. This study furthermore to evaluates the contribution of training and technical assistance program for SMEs development in terms of knowledge, skills and innovation process for business growth and development. With this regards, government have take part to develop a program such as training and technical assistance for SMEs and economic development.

According to the Corporation of Entrepreneurial National Berhad (PUNB), the terms of training can be defined as *"the training that provide a development programs for entrepreneurs with emphasis on practice, value, culture in management practice. This term also include the specific training to increase entrepreneurs understanding of the technical sector, production and quality control."* Whereas, Ministry of Entrepreneurial Development defined the term of technical assistance as *"the types of technical assistance provide include automation and modernization, arrangement of technical agreement for the purpose of technological transfer and other facilities such as* technical *training and improving the quality of production for the development of SMEs"*

The importance of training and technical assistance program for small and medium-sized business development has been recognized as an input of knowledge, skills and innovation process for entrepreneurs in many countries. According to Elfring & DeMan, 1998, knowledge and skills plays a central role more than firm's tangible capital. It is not just a question about knowledge of the product, production techniques, customers and suppliers but also the knowledge, skills and innovation required to integrate the different part in the value chain process.

Presently, there are as many as 20 government agencies involved in providing support programs for entrepreneurs and for the business development. The agencies involved in providing the support programs in terms of training and technical assistance as shown below:

Table 3: Agencies Involved in Training and Technical Assistance Program

Agencies	Ministry
SMIDEC, MIDA, NPC, MATRADE	Ministry of Trade and Industry
DFIs, Commercial Bank, Department of Internal Revenue, AJDF	Ministry of Finance
SEDCs, UDA, MARA, MEDEC	Ministry of Entrepreneurial Development and Co-operative
SIRIM	Ministry of Science and Environment
MARDI, FAMA, FRIM	Ministry of Agriculture
Vocational Schools, Polytechnics, Higher Education	Ministry of Education
HRDF, CIAST, ITI	Ministry of Labour

Source: Abdullah, 1999

Currently, entrepreneurial development and business management training was taking over by Malaysian Entrepreneurial Development Centre (MEDEC) and National Productivity Centre (NPC). Both agencies provided short course training for small and medium sized business under the World Bank fund and provided technical assistance program for target groups. Moreover, other agencies provided entrepreneurial training programs such as MARA, Development Finance Institute and other development center in every university under Graduate Entrepreneurial Training (LKS) and Basic Course on Graduate Entrepreneurial (KAKS).

Whereas, technical skills oriented courses was offered to assist small and medium sized enterprise which normally provide from several agencies such as Standard and Industrial Research Institute of Malaysia (SIRIM), Small and Medium Industries Development Corporation (SMIDEC), Forestry Research Institute of Malaysia (FRIM), Malaysian Agricultural Research and Development Institute (MARDI) under food technology division, Centre for Instructor and Advanced Skills Training (CIAST) and MARA its self.

According to Gavron, Cowling, Holtham & Westall (1998), the factor that giving the confidential to business people to develop their business is by getting support, training and advice from government. Perhaps, with the development and implementation of training and technical assistance programs will helps Indigenous (Bumiputera) entrepreneur's strengthen their knowledge, skills and innovation especially on technology base. The entrepreneurial training and technical assistance programs has significant important for human resources development as mention in Eight Malaysian Plan. *'A strong human resources base to support the development of knowledge-based economy and to enhance productivity and competitiveness will be one of the key strategies in ensuring the nation is able to face the challenges of globalization and sustain economic growth.'*

METHODOLOGY

After identifying the SMEs in Kedah state that meet the criteria for this study, the researcher telephone and email the respective respondents explaining about the purpose of this study. After they agree to participate, the researcher send through post and email an official letter containing questionnaires on related study.

This study was carried out on 30 Bumiputera entrepreneurs in small sector in Kedah state of Malaysia when only 30 out of 100 respondents was returned back the complete sets of questionnaires. Despite, there were a number of questionnaires haven't been reply and the researcher assumed they not willing to participate with this research.

In this study, the researcher will present a descriptive analysis of complete sets questionnaires developments on training and technical assistance programs for Bumiputera entrepreneurs in Kedah. Perhaps this sample size will give a significant representation of SMEs population for this study.

FINDINGS

The finding shown that all respondents (entrepreneurs) realized the greater importance of support programs on training and technical assistance for business development. The finding also identified that 90% of entrepreneurs in Kedah state want to expand their business in future and also put the greater emphasis on their product innovation, improvement and quality for business and product development. Moreover, this will answers the question on the

importance of training and technical program in knowledge, skills and innovation process contribution for business development.

This study also revealed that four aspect in training and technical assistance programs in order to meet the research objectives. Table 4 shows the findings on the most important training programs on entrepreneurs view. Table 5 shows the most recent training program received by customers. Table 6 shows the training programs that can enhance the entrepreneur's knowledge, skills and innovation process in their perspective. Table 7 shows the most training program that could benefit for their business development.

Table 4: The Most Important Training Program Indicates by Entrepreneurs

Training Programs	Percentage
Advisory in Financing and Accounting Management	77%
Technical Skills Training	66%
Market Research and Marketing Planning Training	53%
Basic Entrepreneurship Training Course	50%
Training in Business and Management Development	50%

Table 5: The Most Recent Training Programs Received by Entrepreneurs

Training Programs	Percentage
Basic Entrepreneurship Training Course	90%
Technical Skills Training	66%
Market Research and Marketing Planning Training	53%
Training in Business and Management Development	50%
Advisory in Financing and Accounting Management	50%

Table 6: The Training Programs Could Enhance Entrepreneur's Skills, Knowledge and Innovation Process

Training Programs	Percentage
Advisory In Financing And Accounting Management	80%
Knowledge Management (K-Economy) Training	75%
Human Resource Development Training	70%
Information And Technology (Ict) Training	70%
Training In Business And Management Development	60%

Table 7: The Most Important Training Programs for Business Growth

Training Programs	Percentage
Strategic Planning And Extension Training	80%
Information Technology (Ict) Training	70%
Human Resource Development Training	66%
Knowledge Management (K-Economy) Training	60%
Market Research And Marketing Planning Training	50%

ANALYSIS ON FINDINGS AND SUGGESTION

The interesting findings from this study is on the issues on the importance of training and technical programs where most of Bumiputera entrepreneurs realized that the programs will give a significant improvement on their knowledge, skills and innovation process for business development. Because of time and budget constraints, there are not applicable to attend the training and technical programs conducted by government agencies.

Despite the interesting facts, there were also the inconsistency in findings that includes:
1. The inconsistency in findings on the degree importance of training program (table 4) are not parallel with the most recent training program that they had received (table 5) – 77% was chose the Advisory in Financing and Accounting Management as an important Programs but only 50% of entrepreneurs has received that training.

2. The inconsistency in findings on the importance of training and technical program for business development - 77% of respondents identified that Advisory in Financing and Accounting Management are important but none of entrepreneurs thinks that this programs important for business growth and development (table 7).
3. Most of entrepreneurs (80%) realized that Strategic Planning and Extension Training would give a significant impact for business development but none of them attend that program.

With the interesting and inconsistencies findings, the researcher can summaries that the SMEs business owners in Kedah state were not have clear and precise information regarding the training and technical assistance programs. The improvement on training and technical assistance it self should be made in order to create the successful Bumiputera entrepreneurs. Furthermore, the improvement on information distribution regarding the programs should be clear clarified by the agencies involved.

CONCLUSIONS AND RESEARCH IMPLICATION

This research will provide an appropriate finding that can have an importance implication to a number of interest parties. This research perhaps would provide some guidelines especially for small business owner, government agencies and academician.

1. Small and Medium-sized Business Entrepreneurs
   Firstly, it is important for small and medium sized business to participate with training and technical programs in order to make sure that they have a good knowledge, skills and innovation aspect in their business life. Elfring and DeMan (1998) was mention that knowledge based society is crucial for business growth and knowledge and skills also plays an important role more than tangible assets to integrate the different part in value changes process. In addition, the knowledge-based organization's also important to strengthening networking between firms.

   The researcher also would like to recommend the small business to give an emphasis on innovation process issues for product and business development. There was evidence from OECD (2000), Moran (1998) and Rasiah (2001) that innovation, improvement and quality as crucial factors for business growth.

2. Government Agency
   It is important for government agencies to evaluate the existing assistance programs such as training and technical assistance for business people. Perhaps, some improvement and immediate action should be taken in order to make better and more efficient programs. The information distribution should be handle in a good manner that can clearly defined by entrepreneurs where this will helps the entrepreneurs get the right information at the right time.

3. Academician
   This study also important for future research among academician and researcher. Researcher suggested to another academician to undergo similar topic due to an increasingly important on training and technical assistance program for entrepreneur's knowledge, skills and innovation process development of their business. However, further research should be emphasis on the importance of networking, innovation, improvement on quality for business development.

REFERENCES

Abdullah, M.A. (1999). *The Accessibility of the Government-sponsored Support Program for Small and Medium Sized Enterprise in Penang,* Elsevier Science, Vol.16, No.2, pp. 83-92.

Elfring, T. & DeMan, A. (1998). *Theories of the Firm, Competitive Advantage and Government Policy,* Technology Analysis and Strategic Management Journal, vol.10, no.3, pp.283-293.

Gavron, R., Cowling, M., Holtham, G., & Westall, A. (1998). *The Entrepreneurial Society*, Institue for Public Policy Research (IPPR).

Hall, C. (2003). *Research Design: Successful Design for Social and Economic Research,* 2nd edition, London: Routledge.

Hor, A. (2001). *The Datum X Change SME Definition: Definition of SME in Malaysia vs. Asia*, Kuala Lumpur.

Moran, P. (1998). *Personality Characteristics and Growth Orientation of Small Business Owner-Manage*r, International Small Business Journal, vol.16, no.3.

OECD (2000). *OECD Small and Medium Enterprise Outlook: Enterprise, Industry and Services,* OECD Publications.

Rasiah, R. (2001). *Government Business Co-ordination and Small Business Performance in the Machine Tools Sector in Malaysia,* The World Bank Institute.

Samat, H. (2000). *DFI's Roles in SME Development.* Paper presented in Tokyo, Japan from November 6-21, SMIDEC.

University Kebangsaan Malaysia (2000). *Sarawak Bumiputera Commercial and Industrial Community Master Plan 2000-2010*, UKM: Research and Innovation Bureau.

Business Development Challenges Confronting FELDA Settlers of Small Business Enterprise

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ABSTRACT
FELDA settlers are traditionally those harvesting oil palm, tapping rubber or involved in other agricultural activities as part of government-sponsored FELDA land schemes. But now many FELDA settlers are involved in cottage-based or backyard industries, small-time businesses, cattle rearing or farming apart from being full-time settlers. Why are they diversifying into entrepreneurship - is it for survival, out of interest, or due to encouragement and help from FELDA itself? This paper is conducted as an in-depth study of 81 FELDA settlers involved in small enterprise in FELDA Keratong, Rompin, Pahang to determine their business development characteristics: innovativeness, motivation, sales and marketing skills. Why do some settler-entrepreneurs still lag in business and what needs to be rectified among them? Furthermore, what are the skills that FELDA settlers may develop to become more enterprising so that their livelihood will no longer depend solely on FELDA plantations?

INTRODUCTION

It was the vision of the late Prime Minister Tun Abdul Razak to give land to the landless for cultivation but it is the former Prime Minister Tun Dr. Mahathir Mohamad who was keen to see Federal Land Development Authority (FELDA) settlers develop their entrepreneurial skills.

Since 1956, FELDA has been doing consistently well, emerging as a market leader in palm oil-based products. FELDA currently owns 354,554 hectares of plantation, 72 palm oil mills, six refineries and 275 settlements nationwide. About 95 per cent of FELDA land scheme settlers are Malays while the remaining are Chinese, Indians and other races. (NST, 31 August 2003)
Many settlers opt to look for second jobs to supplement their income. Some of them like to earn a living by working as security guards, ordinary workers in factories and plantations, or any other odd jobs. Urged by the need to improve their standards of living, small portions of settlers prefer to be entrepreneurs within the perimeter of the plantations where they stayed.

During the economic crisis, settlers enjoyed good returns, with FFB prices reaching an all-time high of over RM420 per tonne. Incomes of the rubber smallholders also improved tremendously.

There have been few studies on FELDA entrepreneur-settlers in Malaysia. As the role and participation of settlers in business have been increasing, it has gained the attention of local dailies and government agencies. For example, an article by the New Straits Times on Friday, 31 October 2003 about "Changing mindset of settlers" described the introduction of small and medium industries (SMIs) to develop settlers' entrepreneurial skills. More opportunities will be created when the government sets up agriculture-based small and medium industry (SMI) zones in FELDA schemes nationwide to provide settlers with a second income.

There is little information available in Malaysia on settlers' entrepreneurial characteristics, management practices, motivating factors and marketing skills. Although the role and contribution of FELDA settlers in business is widely recognized in Malaysia, there are no studies done on such business management issues. Following that, this study was conducted to examine demographic profiles, characteristics, innovativeness, motivating factors and marketing effectiveness. Among the key research questions raised was whether there were any significant differences between successful and less successful small business settlers in terms of their

characteristics and innovativeness. These are important questions as the government is committed to developing settlers to achieve Vision 2020. This paper will help identify and understand better the key distinguishing characteristics and other related factors of successful and less successful settlers.

The objectives of this paper are to describe the key characteristics and demographic profiles of small business FELDA settlers in Rompin, Pahang. Specifically, this paper will also reveal the relationship between successful and less successful settlers, their management practices, key motivating factors and problems encountered during the start-up process and in the operations of business.

FELDA COMMITMENT TO THE SETTLERS

FELDA will be launching a guidance programme in its 275 settlements nationwide to help cultivate a culture of entrepreneurship among settlers. This programme will equip the settlers with the necessary skills to start their own business. The main objective is to help settlers become independent and less reliant on government aid. (NST, 15 June 2003).

FELDA has prepared a RM50 million fund for settlers who want to start a business, offering loans of up to RM50,000 with flexible repayment periods. For projects that require more than that amount, FELDA will ask them to prepare working papers. However, only RM2 million has been utilized since its introduction a year ago. (NST, 31 August 2003)

Apart from providing funds, FELDA also provides consultancy help. Working with Permodalan Usahawan Nasional Bhd. (PUNB), FELDA offers three business modules to help prepare settlers become entrepreneurs. The three modules are for beginners, intermediates (those who have started a business and need further support) and a special group (women). (NST, 31 August 2003)

RESEARCH QUESTIONS

Some research questions were formulated as follows:

1. Do levels of education have great influence on success?
2. What are the motivating factors that encourage settlers to venture into small business enterprise?
3. Do they really need government support to improve their livelihood or standards of living?
4. Do settlers need training and coaching in areas of innovativeness and marketing?
5. Do they have the motivation and entrepreneurial profile to become better businessmen in future?

RESEARCH OBJECTIVES

1. To analyse the demographic profiles of small business FELDA settlers in Rompin, Pahang.
2. To identify the differences between successful and less successful FELDA settlers with regard to their nature of business, experience and motivation to be an entrepreneur.
3. To determine relationships between successful and less successful entrepreneurs with regard to their entrepreneurial characteristics and innovativeness.
4. To analyse the settler-entrepreneurs' motivating factors and marketing effectiveness in achieving successful business strategies
5. To suggest from the findings, means by which the FELDA settlers can improve their overall small business management efforts.

RESEARCH METHODOLOGY

In this study, achievement and motivation are measured against six different dimensions, which are: demographic profiles, business backgrounds, personal characteristics, innovativeness, motivating factors and marketing skills.

Sample Size

The survey contains questions to get the 81 settlers' points of view on certain issues through convenience sampling. The information was obtained using structured questionnaires and personal interviews by the authors.

In the sample, 41% of the respondents were involved in reseller services, 4% agriculture services, 7% animals husbandry, 9% contracting works, 10% repair work and 14% food and beverage services.

Data Collection

With the assistance of some local people, the authors went to see the small business settlers at their settlements or business premises throughout the Keratong Settlements (from FELDA Keratong 1 to 10), Rompin District of Pahang for a period of about 10 days and managed to meet with 81 respondents. It is estimated about seventy per cent of the FELDA settlements in Rompin were visited by the authors.

As this is a descriptive study, there are obviously many limitations. The main one is that at the time of the authors' visit, some respondents were not available at their homes or business premises.

Data Analysis

Data was analysed in the SPSS 11.5 version. The reliability coefficients for personal characteristics and innovation are Cronbach Alpha of 0.7676 and 0.6657 respectively, obtained after the survey. Both levels are considered to be acceptable.

In this study also, successful small business settlers are defined as those whose businesses can generate income of more than RM1,000 per month, while those who earn less than that amount are considered less successful (refer table1). The benchmark level of RM1,000 per month and below as income is considered the low income level and this will be analysed on how those below this level be able to improve and become better performers.

FINDINGS

Demographic Profiles of Successful and Less Successful Small Business FELDA Settlers

General demographic profiles of both successful and less successful settlers are summarized into ten different areas: educational backgrounds, business experience, reasons why people become settlers, type of business, settler experience, registration of business licenses, number of hours and days spent for business, reasons for becoming involved in entrepreneurship, average sales turnover and number of employees (refer table 3).

Table 2 shows that FELDA settlers have low educational backgrounds, with the majority (75%) reaching only Primary 6 education or below and the rest (23%) having secondary school education. Only one attained tertiary education.

Statistically, the majority (72% or 58 out of 81) of the respondents earning more than RM1,000 have more than six years experience in businesses. Of the less successful settlers, almost all of them, or 96%, have more than six years experience.

The majority (52%) of successful settlers chose to be settlers to seek a better life whilst the majority (57%) of less successful settlers cited "earning a living" as their reason for becoming FELDA settlers.

Statistics show that most successful settlers are involved as middlemen (48%), manufacturers (17%) or contractors (12%).

Almost all (95%) of the settlers have been a settler for more than 10 years. The majority (86%) of the respondents have registered their business licenses as sole proprietorship.

Data indicates that the majority of successful and less successful respondents spend 9 to 11 hours (64%) of work for their business and work between 26 to 30 days a month (72%).

About 63% of successful settlers chose to be entrepreneurs because of their hope for a better future and 24% of them chose to become entrepreneurs to earn more income. Motivating factors for being successful in business are: support and encouragement from other parties (about 26%), and courage as well as determination to succeed (19%).

The majority of both successful and less successful respondents (77%) have average sales turnover of less than RM20,000 per month and about 88% employ less than 5 persons.

Table 1: Income Group

Income Level	No of settlers	Percentage	Total
1000 –below	23	28.4	28.4
1001-2000	48	59.3	59.3
2001-3000	5	6.2	6.2
3001-4000	1	1.2	1.2
5001 above	4	4.9	4.9
Total	81	100	100

Table 2: Education Background

Question	Variables	Income Group					Total
		1000 - below	1001- 2000	2001- 3000	3001- 4000	5001 above	
Education	primary school	20	35	4	1	1	61
background	secondary school	3	12	1	0	3	19
	lower tertiary	0	1	0	0	0	1
	Total	23	48	5	1	4	81

The Differences Between The Level of Income and The Settlers-Entrepreneurs' Nature of Business, Experience and Motivation

Based on table 3, the chi-square of 26.149 and p-value of 0.000 shows that there are highly significant differences between settlers' income when categorized by their nature of business.

But when income is categorized by experience as entrepreneurs, the chi-square of 7.577 and p-value of 0.108 confirm no significant differences. Table 3 also reflects there are highly significant differences in income levels when categorized according to the motivation of becoming a businessman.

Table 3: Demographic Profile

Questions	Variables	Income Group		Total
		Less Successful	Successful	
In the beginning, why did you choose to be a settler?	to earn a living	13	23	36
	there were no other jobs	1	3	4
	encouragement from others	2	1	3
	for a better life	5	30	35
	interested in estate/ Felda work	2	1	3
	Total	23	58	81
What is the type of your business?	Agriculture	0	3	3
	Farm animals/poultry	6	0	6
	Processing / manufacturing	3	10	13
	Middleman	5	28	33
	Contractor	0	7	7
	Repairing work:motor/engine w/shop	3	5	8
	Food & beverage services	6	5	11
	Total	23	58	81
	Chi-Square = 26.149; P-Value = 0.000 (highly significant at 1% level)			
How long have you been doing business?	less than 2 years	0	3	3
	3-5 years	1	13	14
	6-10 years	15	27	42
	11-15 years	3	11	14
	more than16 years	4	4	8
	Total	23	58	81
	Chi-Square = 7.577; P-Value = 0.108 (not significant at 5% level)			
How long have you been FELDA settlers?	less than 10 years	0	4	4
	11-15 years	3	21	24
	16-20 years	9	17	26
	21-25 years	11	16	27
	Total	23	58	81
Business registration - If registered, in what form?	Sole proprietorship	21	50	71
	Partnership	0	6	6
	Sdn. Bhd	1	2	3
	Total	22	58	80
How many hours do you spend doing business daily?	3-5 hrs	2	0	2
	6-8 hrs	5	2	7
	9-11 hrs	11	41	52
	more than 12 hrs	5	15	20
	Total	23	58	81

Questions	Variables	Income Group		Total
		Less Successful	Successful	
In a month, how many days do you spend for business?	16-20 days	5	1	6
	21-25 days	6	11	17
	26-30 days	12	46	58
	Total	23	58	81
Key reason for becoming a businessman	for a better future	8	37	45
	to earn more income	9	14	23
	freedom and independence	2	1	3
	encouragement from family	3	1	4
	to prove that I can be a success	0	3	3
	dissatisfaction with current situation	0	1	1
	Others	1	1	2
	Total	23	58	81
	Chi-Square = 12.278; P-Value = 0.056 (significant at 10% level)			
Key factors of a successful business person?	Courage, willpower and determination	13	11	24
	Hard work and diligence	6	9	15
	Good/efficient mgmt. and administration	0	8	8
	Customer-focus and good service	2	7	9
	Effective sales and marketing mgmt.	0	1	1
	Bravery and confidence in business	1	7	8
	Support and encouragement from others	1	15	16
	Total	23	58	81
	Chi-Square = 17.424; P-Value = 0.008 (highly significant at 1% level)			
Average sales (RM) turnover/ contract value/ production capacity per month	below 20,000	22	40	62
	21,000-50,000	1	11	12
	51,000-100,000	0	4	4
	101,000-200,000	0	3	3
	Total	23	58	81
Total number of employees	below 5 persons	23	49	72
	6-10 persons	0	8	8
	11-20 persons	0	1	1
	Total	23	58	81

The Relationship Between The Income Levels of Settlers With Their Entrepreneurial Characteristics and Innovation.

Table 4 shows the innovative variables of "You're always observing competitors' movements and tactics" (-0.414**), "You always use modern communications" (-0.520**) and "In your business management, you usually use PC and software" (-0.520**) are strongly correlated to the level of income of settlers.

Variables for "You're always open to new ideas and accept changes" and "You're always doing research and in-depth study to develop your business" show positive but weak relationships with income levels.

The Pearson Correlation Test shows there are no relationships between the variables of entrepreneurial characteristics and the income levels of settlers.

Table 4: Correlations Among Income Level And Innovation

		Income group
You're always observing competitor's movements and tactics	Pearson Correlation	-.414(**)
	Sig. (2-tailed)	.000
	N	81
You always use modern communication such as handphone, e-mail, fax	Pearson Correlation	-.608(**)
	Sig. (2-tailed)	.000
	N	81
You usually use PC and software	Pearson Correlation	-.520(**)
	Sig. (2-tailed)	.000
	N	81
You're always open to new ideas and accept changes	Pearson Correlation	-.250(*)
	Sig. (2-tailed)	.024
	N	81
You're always encouraging business partners and employees	Pearson Correlation	-.069
	Sig. (2-tailed)	.541
	N	81
You're keen to learn how to be more successful	Pearson Correlation	-.048
	Sig. (2-tailed)	.667
	N	81
You're always doing research and in depth studies to develop your business	Pearson Correlation	-.262(*)
	Sig. (2-tailed)	.018
	N	81

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

The Marketing Effectiveness of FELDA Settlers in Small Business Enterprise

Data in table 5 show that 95% of all respondents place major emphasis on sales and marketing training . An analysis of general business attitudes indicates that over the past five years, 38% of successful entrepreneurs had "for survival" and "to prevent from making loss" (31%) as their main objectives. But this has changed, as for the next five years, their main objective is "to expand into new markets" (47%). "For survival" is cited by merely 17% of successful respondents.

Almost all (90%) successful and less successful respondents said their best approach to enter the market is through usual channels, that is, "approach the customers as usual" without any marketing strategy employed.

With respect to their company's approach to competitors, successful settlers (74%) are " careful to the competition" whilst the less successful ones (52%) tend to "just ignore the competitors".

Predictably, successful settlers (71%) seem to be willing to take higher risks to develop their businesses compared with the less successful, whereby this is highly significant (at p-value 0.000). In the area of competitive advantage, successful settlers believe that price (48%) and quality of product (21%) differentiate their business from the nearest competitors.

Overall effectiveness of the marketing skills and strategy employed by the less successful is lower than for the successful entrepreneurs. The less successful settler-entrepreneurs "just ignore the competitors", "avoid taking risk" and employ "less creativity" in approaching or penetrating the market.

Table 5: Marketing

Questions	Variables	Income Group		Total
		Less Successful	Successful	
You have a strong background in training of sales and marketing	Yes	1	14	15
	No	16	42	58
	not sure	6	2	8
	Total	23	58	81
You assume that training in marketing is important in business	yes	20	57	77
	no	2	1	3
	not sure	1	0	1
	Total	23	58	81
What was your company's main objective for the past 5 years?	for survival	13	22	35
	to prevent from making loss	4	18	22
	to improve productivity	1	1	2
	to improve in the current market	4	13	17
	to expand my business in new market	1	4	5
	Total	23	58	81
What is your company's main objective for the next 5 years?	for survival	1	10	11
	to prevent from making loss	12	8	20
	to improve productivity	1	4	5
	to improve in the current market	4	9	13
	to expand the business in new market	5	27	32
	Total	23	58	81
	Chi-Square = 14.617; P-Value = 0.006 (highly significant at 1% level)			
Who runs the marketing activities?	the owner himself	22	54	76
	appoint a manager for all mgmt functions	1	0	1
	appoint one of the partners or directors	0	4	4
	Total	23	58	81
What's your company's best approach to enter the market?	attack the whole potential market	0	2	2
	attack selected market segments	0	2	2
	target individual customers only	1	1	2
	approach customers as usual	21	52	73
	approach to customers by offering promotional packages	1	1	2
	Total	23	58	81
What's your company's approach towards competitors in the marketplace?	just ignore the competitors	12	7	19
	be careful to the competition	9	43	52
	avoid head on competition	0	1	1
	just follow whatever competitors do	2	2	4
	try to overcome the competition	0	5	5
	Total	23	58	81
	Chi-Square = 17.734; P-Value = 0.001 (highly significant at 1% level)			
What's your company's approach to taking risks?	Avoid risk	11	2	13
	lower risk, lower returns	7	13	20
	higher risk, higher returns	1	7	8
	Ready to take any risk for a good return	2	8	10
	be careful, wait and check out the market	2	28	30
	Total	23	58	81
	Chi-Square = 28.945; P-Value = 0.000 (highly significant at 1% level)			
What's your company's approach towards quality compared with the nearest competitors?	higher quality	2	16	18
	more or less the same	20	29	49
	try to be better than	1	9	10
	try to improve to be at par	0	4	4
	Total	23	58	81
	Chi-Square = 9.613; P-Value = 0.022 (significant at 5% level)			

How do you rate your product prices compare with the nearest competitors?	so much cheaper	1	0	1
	slightly cheaper	3	9	12
	more or less the same	19	46	65
	more expensive	0	3	3
	Total	23	58	81
	Chi-Square = 3.802; P-Value = 0.284 (not significant at 10% level)			

Motivating Factors

For both successful and less successful FELDA settlers, the key motivating factor for going into business was "for survival" of their livelihood. "Preventing from making loss" was ranked second while "Trying to improve the business" was ranked third.

But for the next five years, their key motivating factors have changed to "expanding their business", with this being highly significant (at p-value 0.006) between the two settlers.
This factor is also related to approach to risks (highly significant p-value 0.000) and interest in entrepreneurship.

Problems Encountered by FELDA Settlers in Small Enterprise

During the start-up phase, successful and less successful settlers faced three problems: lack of sales and marketing skills (72%), weak management practices (43%) and motivating factors. These are common problems among small businesses in Malaysia.

At present, however, the majority of less successful settlers seem to be doing business to prevent from making loss (35%) whilst successful settlers are trying to "expand the business into new markets" (47%). This shows the different motivating factors between the two groups.

These findings reveal that the problems between successful and less successful settler-entrepreneurs vary in stages. Motivation and marketing become a central issue while later on, expanding into new markets seem more important. The attitudes of less successful settler-entrepreneurs towards marketing are rather passive, and this translates into weak overall performances. As can be seen from table 5, the less successful are less motivated when they set their objectives in doing business: "to prevent from making loss".

Another important piece of information is that the less successful entrepreneurs are less effective in applying innovation to their businesses. Even though there are constraints in innovativeness, these could be rectified through proper training and learning.

Besides this, most of the FELDA settlers are not expanding or diversifying their businesses into other areas or territories. They prefer to venture into small scale retail businesses (sundry shops) or undertake contract work within their settlement's perimeter. This is a main factor contributing towards the low income earned by the entrepreneurs. They are willing to work harder but they still fail to progress in business. The extra time lavished on their businesses do not translate into higher incomes, mainly due to lack of guidance in expanding and diversifying operations.

Another important fact is that about 75% of the settlers are educated only up to primary school level. Educational levels highlight the important relationships among entrepreneurial attitudes, motivations and innovations skills.

This being said, Jacobowittz & Vidler, 1982; Brokhaus, 1982; Gosselin & Grise (1990) concluded entrepreneurs tend to be better educated than the general population. However, they tend to be, on average, slightly less educated than managers or executives in organizations.

Levels of education are also important as the settler-entrepreneurs have to continue to cope with problems, correcting deficiencies in their business (Hisrich, 1990).

RECOMMENDATIONS

In the case of ownership, 85% of successful settlers who were sole proprietors were successful in their business, earning more than RM1,000 per month. This suggests that type of ownership may affect the way settler entrepreneurs manage their business. It also supports the proposition by Child that organizations run by managers with substantial personal stakes in ownership will tend to achieve better performance.

The objectives of this study are also to isolate the successful and less successful settlers in Rompin, Pahang and to identify their attitudes and skills towards marketing activities and motivational issues. Findings from this survey suggest some practical implications.

Firstly, the significant differentiating factor between successful and less successful settlers is creativity and innovativeness. To become entrepreneurial, changing the mindset of settlers from being mere cottage-based, backyard industries or small family-based operations, is crucial.

Secondly, for the settlers to become better performers, they need to become aware of the central importance of internal and external marketing skills. To achieve this, training must be used by FELDA authorities as an agent of change in assisting the settlers to create a marketing-oriented culture.

Kotler (1991) defined marketing thus: 'Marketing is a social and managerial process by which individuals and groups obtain what they need and want through creating, offering and exchanging products of value with others'. He also believed that stronger company marketing skills could potentially launch a new era of high economic growth and rising living standards.

Thirdly, changing the mindset of settlers should be supported by strong key motivation factors. Hence, preparation of both short term and long term planning appear to be essential ingredients to becoming a better performing FELDA settler. Once settlers have been trained and well motivated, they would become better achievers with increased chances of success .

CONCLUSIONS

The findings of this study imply the government of Malaysia, especially FELDA authorities, should give proper attention to enhancing the management and marketing skills of FELDA settlers. The various agencies involved in the training of small business settlers, including the FELDA authority itself, MARA, MARDI, KPUN and other major agencies, should try to develop special training programmes for settler-entrepreneurs to cope with problems, gain motivation and learn skills they lack. Such assistance need to be given, as well as continuous assessment of the viability of the business. FELDA and the government should look into setting up an "Entrepreneurs' Department of Small Enterprise" in every FELDA settlements across the country.

Lastly, we conclude that there is a need to conduct more extensive research on FELDA settler-entrepreneurs to broaden the scope of the present findings. More research should also be undertaken to explore new dimensions in managerial practice, socio-economic and motivational elements that could lead to the development of new theory that will boost the FELDA settlers' chances of success.

REFERENCES

Allen, K.R. (1999). Growing and Managing an Entrepreneurial Business, Houghton Mifflin Co
Baharuddin, Z. F. (2003). Felda boosts quality for greater yield, NST August, 31.
Damodaran, R (2003). The Felda Success Story, NST October, 31.
Drucker, Peter F. (1995). *Innovation and Entrepreneurship: Practice and Principles*. London: Butterworth and Heinemann Ltd.
Hissrich, R. D. and Brush,C. (1986). Characteristics of the Minority Entrepreneurs, *Journal of small Business Management*, October, pp. 1-20.
Kao, John J. (1989). Entrepreneurship, Creativity & Organization. USA: Prentice Hall,
Koh, H.C. (1996). Testing hypotheses of entrepreneurial characteristics: A Study of Hong Kong MBA Students, *Journal of Managerial Psychology,* Vol.11 No. 3, 1996, pp.12-25.)
Kotler, P. (2003). Marketing Management, Analysis, Planning, Implementation and control 11th edition. USA: Prentice Hall.
Krames, Jeffrey A. (2002). The Welch Way: 24 Lessons from the World's Greatest CEO. USA: Mc Graw Hill.

Kuratko, Donald F & Welsch, Harold P. (2001). "*Strategic Entrepreneurial Growth*", Harcourt College Publishers, USA.

Ling, C.S. (2003). New deal for Felda settlers through agriculture-based SMIs, NST June, 15.

Meng, L.A. & Liang, T.W. (1996). Entrepreneurs, Entrepreneurship & Enterprising Culture. Singapore: Addison-Wesley Publishing Company.

Robinson, S.E., Roth, S.L., & Brown, L.L. (1993) Morale & Job Satisfaction among nurses: What can hospitals do? *Journal of Applied Social Psychology*, 23, pp.244

Sahlman, W.A. (1992) The Financial Perspectives: What should Entrepreneurs knows? Harvard Business School, case 293-045.

Scott, C.E. (1986). Why more women are becoming Entrepreneurs, *Journal of Small Business Management*, October, pp 37-45.

Shaker A. Zahra, (1991). "Predictors and financial Outcomes of Corporate Entrepreneurship: An Exploratory Study," *Journal of Business Venturing 6* : 259-286.

Corporate Strategies in the Less-Developed Countries (LDCs)

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ABSTRACT

This paper provides a review of the literature regarding the effect of country environments on organizational strategizing. It is widely acknowledged by both managers and researchers that the less developed countries (LDCs) do not have the same quality and quantity of secondary data as the industrialized economies of the West. Conventional plan-based strategies, that centered on the belief that strategic decisions should be reached systematically and be totally objective, are inadequate to explore the many facets of the strategizing process. The very nature of strategic planning process make decisions subjective, influenced by variables such as personal values, cultural and social factors, stakeholder demands and even the nature of the leadership of the organization (Prahalad and Hamel, 1994; Johnson and Scholes, 1999; Suutari, 1999; Harding, 1994). In LDCs, where factors such as supplies of raw material/components, skilled manpower, industrial and social infrastructure may not be as readily available as they are in advanced economies, managers have to consider a more complex set of issues in their effort to ensure the best strategies for their organizations.

INTRODUCTION

Strategic planning does not take place in a vacuum, but operates within various levels. At a basic level, it can be distinguished into the context of the decision-maker/planner(s), the stakeholders, the organization and the environment (Koopman and Pool, 1987).

It is against this background that the relevance of the country, social and cultural dimension can best be understood. The cultural challenge is in fact far reaching and tends to question the conventional Western management theories of leadership, motivation, organization development, etc., that centered on North American and European view of the business world. For instance, many of the western management principles come from proponents of leadership legitimized largely on the basis of performance and the level of support received from subordinates. Followship is earned and employees have more power to oust, or at the very least, disconcert leaders. Hence, that is why we can see the large number of literature on empowerment, employee satisfaction, commitment, teamwork and morale (Bruce and Blackburn, 1999; Vanderberg et al, 1999; Kirkman and Rosen, 1999; Kirkman and Shapiro, 2001). By contrast, Asian management study requires greater understanding of group-oriented societies where people define themselves as members of communities and consider the group welfare most important. Open challenges of the leader are considered improper and undesirable. The power and authority of the leader are accepted as right and proper, and in return the leader must accord followers respect and dignity (face), and show that they care for the employees (Blunt and Jones, 1995). Hierarchy is viewed as the natural way to order social relations. In some case, leadership is maintained and revered, not through knowledge or technical competence, but through deep historical roots and "conformity to the 'natural' order of power relations" (Kirkbride et al, 1991). This is one reason why there is still a lot of nepotism and similar behavior in the Asian environment. For instance, Kim and Kim (1989) examined kinship groups and patrimonial executives in the Republic of Korea with a focus on the kinship base for and the treatment of patrimonial managers. Their findings reveal that 46.2% of executives in 97 Korean firms sampled were related to the founders by either kinship or local ties.

However, to say that there's a single Asian management style that could define all the Asian region is impossible to do because if we were to compare just a small section of the Asian region, lets say, South East Asia, even this region has too much diversity to be grouped into one entity. Each country has its own rich cultural, economic, religious, legal and ethnic background, (and except for Thailand) has a history of colonial power that has been shaping their system until recently.

ENVIRONMENTAL FACTORS

Although there are numerous researches on corporate strategies focusing on the CEOs and corporations in the US and also West Europe, research findings from emerging and less developed economies are still noticeably lacking (Hoskisson *et al*., 2000). This fact is also pointed out by Zeffane and Rugimbana (1995) when doing

research on developing countries. Haley & Tan (1996), in their study on the availability of business-related information in South-east Asia, admitted that emerging and newly industrialized economies do not have the same quantity of secondary data as the industrialized West. This informational void has posed a challenge to Western MNCs that are used to information-rich, strategic-management techniques back home. The findings suggested that this void means the Asian managers themselves have adopted a more hands-on type of management approach, a highly intuitive decision-making style in coping with the fast-changing business, cultural and competitive environment.

Bearing in mind that is unrealistic to assume all the findings about the organizational planning styles in emerging economies having equal validity for all those countries, there is still some similarity in terms of issues and challenges that set them apart from their western, developed counterpart. For instance, many researchers held the view that the public sectors in most of these countries tend to be too large and are quite dominant players in their various industries (Kiggundu, 1991; Zeffane, 1992). The western model of leaving the task of economic development mostly to private corporations, is deemed not suitable for the poorer countries that need a push and collective intent on achieving their desired development goals. While some governments have created rigid frameworks for guiding their industry into the 21st century, others have limited themselves to so-called "infant' or "pioneer" industry policies.

Managers who operate in an environment that places high importance on familial and national value also tend to look at different range of issues when considering strategies (Fukuyama, 1995; Ali, 1993; Selmer and De Leon, 1993; Mintzberg, 1994).

Hofstede (1994) suggested that these differences are among the reasons why the management and decision-making styles of the West differ somewhat from Asia. For example, in Malaysia, because of the strong influence of Japanese investment and the government's 'Look East Policy', there is a tendency for Malaysian managers to look to Japan when trying to emulate the so-called Asian management style. The Look East Policy (LEP) was implemented in collaboration with the Malaysian and Japanese government aimed to encourage Malaysians to emulate and learn the work ethics and the positive attitudes of the Japanese. Because of its multi-racial society, awareness of each racial group's sensitivity is also very important knowledge for managers in Malaysia. For instance, great emphasis is given to the observance of courtesy and the saving of "face" during any transaction (Hamzah Sendut, 1980). Once any party is made to lose "face", the relationship breaks down and it is often impossible to pursue the transaction further.

In terms of resource management in developing countries, reliance on a single natural resource may increase the likelihood of direct government intervention in the industry. The Middle East, with their immense reserves of crude oil, is a case in point. Research findings in the Middle East have shown that there is a tendency for high government's control in their major industry, such as, oil and gas. At-Twaijri and Woodworth (1996), when doing research on Saudi Arabian government involvement in the oil industry, found that in an effort to escape from the primary producer trap, the Saudi Arabian government is using its oil wealth to establish a more robust industrial economy. Because the industrial project of the oil industry is deemed too large to be undertaken by the local traditional, family-owned organizations alone, the Saudi Arabia government has established a government agency, through which oil revenues are directed to developers. Through this agency, the government has also attempted to solve the problem of lack of experience and use of obsolete production technology among the local suppliers by forming joint ventures with established MNCs to expedite transfer of technology to the country. However, this inflow of Western MNCs have lead to local suppliers feeling neglected in terms of the contract awards because it is impossible for them to compete with the MNCs know-how and efficiency .The initial goal of bringing these MNCs in (that is technology transfer), has also not been fully realized because they viewed the government as more concerned about getting the highest quality at the lowest price from these Western joint-partners.

Belghazi (2003) pointed out that since the 1970s Arab countries have witnessed a substantial expansion in access to basic services. The oil boom has permitted the oil-rich Arab states to practice "paternalistic" welfare policies. However, like most developing countries in the world, they are beginning to feel the pressure of globalization and the need to expand their private sectors in order to utilize their resources and economic gains. Jordan and Saudi Arabia are among the few countries that are beginning to shift from a public sector driven economy to a model in which the private sector becomes the engine of growth. As stated by Jasimuddin (2003), the Middle East is struggling to break away from being almost wholly dependent on the export of oil. With this in mind, some of their governments have begun to set up policies and action plans to promote an environment that is conducive for such private business expansion. This is done through the setting up of incentive plans (export policies, capital investment tax relief etc) and expediting privatization programs. This scenario is similar to other emerging economies in Asia where there is a shift from government-controlled industries into ones that are more liberal, and not be too dependent on only one or two commodity industries. A case in point, Malaysia is aiming for "value-added" practices in its industries, be it electronic, timber, agricultural, oil and gas, etc.

Malaysia's economy has expanded rapidly in the last decade. Since 1987, manufacturing has overtaken agriculture as the leading growth sector of the economy. It intends to accelerate the shift towards higher value-added products and activities including research and development (R&D), design and prototyping, distribution, logistics and marketing to stay on track of becoming a developed nation by 2020 (Sundaran, 1994 ; Khor, 1999; Ali, 1997; Wee, 1998).

THE INTER-ORGANIZATIONAL NETWORK APPROACHES

It is obvious that the strength of the RBV and competence-based theories is that they start at the organization level and focus on the distinctive capabilities of the organization in relation to the dynamics of the environment. As pointed out by their proponents - deploying key resources where they are most important to the competitive advantage of the firm is the heart of corporate strategy.

However, not many organizations have the ideal package of all the right valuable resources; and hence, for some, it is worthwhile to form strategic networks with competitors, suppliers and customers to increase their capabilities. This approach is advocated by Beerel (1998), who stated that competitive power lies in the competence and responsiveness of the creative relationships working in harmony, not in taking the stance of the lone warrior or an isolated and impregnable fortress. Developing the organization's capacity to form shrewd and potent alliances is the task of the strategic planning team.

Developing a business culture that supports networking is not an easy task. But due to its overwhelming benefits and opportunities, the importance of inter-firm linkages is now being recognized in western countries and even leading to the setting up of industrial policies in many countries to facilitate closer business relationships, e.g., Australian's Business Network Program, etc.

In Asia, the concept of networking is very much part of the business landscape. Research by Laisserre and Schutte (1999) shows that the Asia Pacific region is one of those areas of the world where building and cultivating relationships is crucial to business development. Personal and reciprocal relationships are placed higher than just mere contractual and transactional ones. For instance, the Chinese business networks, known as Quanxi, are so successful throughout South East Asia and Indochina, that it is becoming the predominant economic force. Because there is no exact Western version of this concept, it has been given different definitions by different researchers, for example, some viewed it as a "friendship with implications of a continual exchange of favors (Chen, 1995); Xin and Pearce (1996) suggest that Quanxi is best described as a "personal connection in society", whereas Yeung and Tung regarded it as a principle of "who you know not what you know", Notwithstanding the different definitions, the importance of Quanxi cannot be underestimated as the overseas Chinese business networks possibly constitute the single, most dominant, private business groupings in Asia outside of China, Japan, and South Asia. They form 3.5 percent of Indonesia's population, 29 percent of Malaysia's, 2 percent of the Philippines', 10 percent of Thailand's, and 77 percent of Singapore's. But being a minority race did not prevent them from controlling 73 percent, 69 percent, 50-60 percent, 81 percent and 81 percent respectively of listed firms by market capitalization in these countries (Vatikiotis ,1998). In fact, some research has shown that that the dynamic of East Asian economies is built by the Chinese family business that has practiced this concept (Haley and Haley, 1998; Yu, 2001; Wood and Whiteley, 2002; Kao, 1993; Yeung, 1998; Davies et al, 1996; Chen 1995). Japan and Korea are another case in point, where their Chaebol and Kerisu networking had extraordinary success in developing business networks (Shadur and Kienzle, 1997, Morden and Bowles, 1998)

Indeed, based on the growing literature on inter-organizational network approaches (such as Kanter, 1994; Gomes-Casseres, 1994; Hamel, 1991; Badaracco, 1991) it can be seen that organizations could remain competitive through collaborative networks where knowledge is developed and shared. Strategic alliances, joint ventures, equity-sharing agreements, and research consortia are some examples of the activities done by firms to either develop new skills, increase capabilities or make up for internal weaknesses. However, this strategic approach is not without its drawback, as pointed by Thomas and Pollock (1999):

> *....although networks open up opportunities for interaction, they also serve to constrain network members' options and behaviors. If the organization's environment were to suddenly change, the restrictions of the firm's current network might not allow the firm to change along with it. Network can also result in significant transactions costs, although the benefits of developing and participating in the network should more than outweigh these costs.*

It can be seen that designing a successful strategy is never ending. An organization needs to continuously revisit and challenge its assumptions about ways of doing things and to remain flexible.

COMPETITIVE ENVIRONMENT

While strategy is not exclusively concerned with the relation between an organization and its environment, assessment of environment changes and their effects is an essential task in strategic planning process. Historically, the theories surrounding the corporate strategy have changed proportionately with changes in the environment, as shown in table below:

Table 1: The Development Of Corporate Strategy In The Twentieth Century, Showing Important Environment Influences
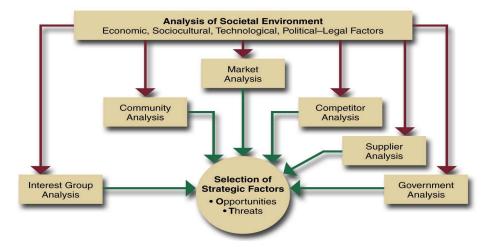
Period	Environment	Strategy and management developments
1900-1910	▪ Colonial wars ▪ Global trading of commodities	▪ Beginnings of examination of the management task, e.g., FW Taylor and Henri Fayol
1910-1930	▪ World war and its legacy	▪ Rise of larger organizations and the consequent need for increased management control
1930s	▪ Cash: trade barriers erected to protect some countries	▪ Formal management control mechanisms developed, e.g. budgeting and management accounting, particularly in the USA ▪ Early human resource experiments in USA
1940s	▪ World war and its legacy	▪ Strong US industry and the birth of formal strategy ▪ Beginnings of organizational theory
1950s	▪ Sustained economic growth coupled with first European trade and political bloc: European Economic Community	▪ First real strategy writings in formal series of papers ▪ Organizational theory is applied to management tasks
1960s	▪ Continued growth until first oil price rise late in the decade	▪ Corporate strategy techniques are researched ▪ Separate parallel development in organizational research
1970s	▪ Growth becomes more cyclical with another oil price shock	▪ Formal corporate strategy techniques adopted ▪ First research writings objecting to same techniques
1980s	▪ Far East and global developments ▪ Computer data handling develops fast	▪ Major strategic emphasis on competitive aspects of formal corporate strategy ▪ Search continues for new strategy concepts emphasizing the human rather than the competitive aspects of the process
1990s	▪ Telecommunications, global corporations, high growth in the Pacific Rim but currency problems in Japan ▪ Some Asian economies in crises	▪ Global concepts of strategy ▪ Greater emphasis on the organization's own resources rather than competition as the basis for strategy development

Source: Lynch, R.. (2000), Corporate Strategy, 2nd Ed., Prentice Hall

As a result of the liberalization and restructuring of many LDCs and increased interdependence of the world's markets, the past decade has witnessed a growing rate of business growth and interest in the role of marketing in these economies (Cavusgil and Yavas, 1984; Okoroafo and Torkonoo, 1993; Sheth, 1992). However, this business opportunity comes with its own sets hurdles. Among the problems faced by industry players in LDCs (especially foreign companies) is the difficulty in finding efficient distribution networks, high bureaucracy and regulations by government agencies in the business environment. This is asserted by Khanna and Palepu (1997) with their research findings that shows in emerging markets, close relationship with political decision-makers and key bureaucrats are considered essential in doing business.

By looking at strategic planning as a tool, there is a question of the significance of external influences on strategy – that is, which environmental domains are the most important and why. This is especially difficult because organizations differ in terms of size, industry, culture, geographical location, people, history, etc. Environmental forces, which are especially important for one organization, may not be the same for another, and

over time, their importance may change. Below are examples of variables that need to be monitored within the external environment:

Source: Wheelen, Thomas L. and Hunger, J. David, (2004,) Stratgeic Management and Business Polic (9th Ed.)y, Prentice Hall, New Jersey.

But generally, the answer lies most importantly, in the type of organization, the industry and the major players in that industry. For instance, studies shows that in Asia there are three major clusters of organizations that dominate the business environment, they are: government-linked corporations (GLCs), either wholly or partly controlled by government; family-owned organizations (which are mostly controlled by Indians or Chinese); and multi-national corporations (Haley and Tan, 1999). Studies have also shown that being a first mover in LDCs can create competitive advantage because the initial stages of trade liberalization in these countries means that the government is slowly deregulating the industries through delicensing, reduction of tariffs on imported goods, pioneer industries' incentives, etc. In addition, first movers have the added advantage of indepth knowledge of the markets, relationship with customers and foothold on resources such as supplies and distribution channels (Aaker, 2001; Arnold and Quelch, 1998; Nakata and Sivakumar, 1997). Michael Porter in his "Five Forces of Competition" model, identifies the essence of strategy formulation as coping with competition, and that competition in an industry comes not only from direct competitors, but from the underlying economics of the industry. These five forces include three sources of horizontal competition - competition from the suppliers of substitutes, threat of new entrants, and from established competition – and two sources of vertical competition – bargaining power of suppliers and buyers.

Other viewpoints on this issue, such as Grant's (1995), state that the prerequisite for effective environmental analysis should involve distinguishing the vital from the merely important. This is because conducting too extensive an environmental analysis would not only fail to be cost effective, but could also create information overload. This sentiment is applicable for doing business in LDCs because of the potential for high growth and newness of the industries that could be shaped by the first movers according to their resources. There is also a growing literature that goes as far as advocating the removal of competition factors in strategic thinking. This school of thought, deviating from the conventional view concerning competition, regards strategic prescriptions such as competitive strategy, competitive benchmarking, etc., as achieving no more than incremental improvement (Womack and Jones, 1996; Ulwick, 1999; Hamel and Prahalad, 1994; Kim and Mauborgne, 1999). Kim and Mauborgne (1999) through their study of organizations in different consumer markets, highlighted that strategy driven by competition usually has three latent, unintended effects:

- *Imitative, rather than innovative, approaches to the market. Companies often accept what competitors are doing and simply strive to do it better.*
- *Companies act reactively. Time and talent are unconsciously absorbed in responding to daily competitive moves, rather than creating growth opportunities.*
- *A company's understanding of emerging mass markets and changing customer demands becomes hazy.*

Thus, rather than competing with competitors, these authors recommend that organizations set a clear direction for improvement, regardless of what the competitors are doing. As Ulwick (1999) asserts:

> *Competing with perfection makes far more sense than competing against a competitor. After all, simply beating a competitor does not guarantee that customers will be satisfied with a company's offering. It simply means the offering is somewhat better at satisfying a desired outcome than a competitor's offering. In reality, customers may be very unsatisfied with the performance of both offerings.*

With this in mind, it is up to each strategist to weigh the arguments put forward by the authors, and judge what would be the best approach. As mentioned previously, no two organizations have the same set of experiences, acquired the same assets and skills, or the same organizational cultures; and different industries tend to pose different set of challenges to the participating organizations.

SUMMARY

It can be seen that designing a successful strategy is never ending. An organization needs to continuously revisit and challenge its assumptions about ways of doing things to remain flexible. Cultural and social aspects have to be taken into account in the process of devising strategies to suit the operating environment. The literature on this topic has shown that governmental and socio-cultural variables play a crucial role on the decision-making styles, and that emerging and developing countries differ somewhat in their way of doing business compared to the developed West's business environment. This study outlines the responses that the managers in LDCS are making towards meeting these diversity and challenges, and hopefully is helpful in shedding some light for future research on corporate strategies in these economies.

REFERENCES

Aaker, D.A. (2001), *Strategic Marketing Management*, 6th ed., Vol. 6, Wiley, New York.

Ali, A. (1993), Decision-making style, individualism and attitude toward risk of Arab executives, *International Studies of Management and Organization*, 23 (3): 53-74.

Arkes H. R., and Hammond K.R. (1986) *Judgment and Decision Making: An Interdisciplinary Reader,* Cambridge University Press.

Arnold, D.J. AND Quelch, J.A. (1998), New Strategies in Emerging Markets, *Sloan Management Review,* 40 (1): 7.

At-Twaijri, Mohammed I. and Woodworth, Bruce M. (1996), Evaluating corporate mentoring in developing economies: The Saudi Arabian experience, *Journal of Management*, 15 (1): 23-36

Badaracco, J.L. (1991) *The Knowledge Link: How Firms Compete Through Strategic Alliances,* Harvard Business School Press, Boston, MA.

Beerel, A. (1998) *Leadership Through Strategic Planning,* International Thomson Business Press.

Belghazi, Saad. (2003), Local Governance, Development and Service Delivery, Arab States Local Government Forum, Regional Bureau of Arab States, UNDP and the Lebanese Center for Policy Studies.

Brown, L (1997) *Competitive Marketing Strategy*, Nelson, Melbourne.

Bruce, W.M. and Blackburn, J.W. (1992), *Balancing Job Satisfaction and Performance: a Guide for Human Resource Professionals,* Quorum Books, Westport, CT.

Chen, M. (1995), *Asian Management Systems: Chinese, Japanese and Korean Styles of Business*, International Thomson Business Press, London.

Chen, P.S.J. (1995), Asian Management Systems, Routledge, London.

Davies, H., Leung, T.K.P., Luk, S.T.K. and Wong, Y.H. (1996), The benefits of `guanxi' and the value of relationships in developing the Chinese market, in Siew, M.L., Swee, H.A. and Chin, T.T. (Eds), *Marketing Insights for the Asia Pacific*, Heinemann Southeast Asia, Singapore.

Fahey, L and Randall, M (1988) *Learning from the future,* Wiley, New York.

Fukuyama, F. (1995), *Trust: The Social Virtues and the Creation of Prosperity*, Hamish Hamilton, London.

Gomes-Casseres B. (1994) Group versus Group: How Alliance Networks Compete, *Harvard Business Review,* July-August, pp. 62-74.

Grant, R.M. (1991) The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation, *California Management Review*, Spring, pp. 114-35.

Grant, R. (1995) *Contemporary Strategy Analysis*, McGraw-Hill.

Grundy, T. (1992) *Corporate Strategy and Financial Decisions,* The Cranfield Management Research Series.

Haley, George T., and Haley, Usha C.V.(1998), Boxing with shadows: competing effectively with the Overseas Chinese and Overseas Indian business networks in the Asian arena, *Journal of Organizational Change Management,* 11 (4): 301-320.

Hamel, G. and Prahalad, C.K. (1994) *Competing for the Future,* Harvard Business School Press, Boston, MA.

Hamel, G. (1991) Competition for Competence and Inter-Partner Learning Within International Strategic Alliances, *Strategic Management Journal*, Vol.12, Summer Special Issue, pp. 83-103.

Hamzah Sendut (1980), Professional Management in a Plural ASEAN Society, *Malaysian Management Review,* Vol. 15, No.3: December.

Hofstede, G. (1993) Cultural Constraints in Management Theories, *Academy of Management Executive,* 7 (1).

Hosskisson, R.A., Eden, L., Lau, C.M. and Wright, M. (2000), Strategy in Emerging Economies, *Academy of Management Journal,* 43 (3): 249-67.

Jasimuddin, Sajjad M. (2001), Analyzing the competitive advantages of Saudi Arabia with Porter's model, *Journal of Business & Industrial Marketing,* 16 (1): 59-68.

Johnson, G., and Scholes, K. (1999) *Exploring Corporate Strategy*, Prentice Hall Europe.

Kanter, R.M. (1994) Collaborative Advantage: The Art of Alliances, *Harvard Business Review,* July-August, pp. 96-108.

Kao, J. (1993), The worldwide web of Chinese business, *Harvard Business Review*, March-April, pp.24-36.

Khanna, T. and Palepu, K. (1997) Why Focused Strategies May Be Wrong for Emerging Markets, 75 (4), July-August: 41.

Khor, Martin (1999), Policy needed to deal with capital flows, *Utusan Konsumer*, 29 (5): 19.

Kienzle, Rene, and Shadur, Mark (1997), Developments in business networks in East Asia, *Management Decision*; 35 (1): 23-32.

Koopman, Paul L., and Pool, Jeroen (1987), Decision making in Organization, (article in book on Key Reviews in *Managerial Psychology*, p. 189).

Kiggundu, M.N. (1991), The challenges of management development in sub-Saharan Africa, *Journal of Management Development*, 10 (6): 32-47.

Kim, K.C. and Kim, S. (1989), Kinship group and patrimonial executives in a developing nation: case study of Korea. *Journal of Developing Areas*, 24 (1): 27-45.

Kim, W.C., and Mauborgne, R. (1999) Strategy, Value Innovation, and the Knowledge Economy, *Sloan Management Review,* Spring Special Issue, pp. 41.

Kirkbride, P.S., Tang, S.F.Y. and Westwood, I. (1991), Chinese conflict preferences and negotiating behaviour: cultural and psychological influences, *Organisation Studies*, 12 (3): 365-86.

Kirkman, B.L. and Rosen, B. (1999), Beyond self-management: antecedents and consequences of team empowerment, *Academy of Management Journal*, 42 (1): 58-74.

Kirkman, B.L. and Shapiro, D.L. (2001), The impact of cultural values on job satisfaction and organizational commitment in self-managing work teams: the mediating role of employee resistance, *Academy of Management Journal*, 44 (3): 557-69.

Lasserre, P. and Schutte, H. (1999), *Strategies for Asia Pacific – Beyond the Crisis*, MacMillan Press, Basingtoke.

Mead R. (1994), *International Management: Cross-Cultural Dimensions*, Blackwell.

Mintzberg, H. (1994), *Rise and Fall of Strategic Planning: Reconceiving Roles For Planning, Plans, and Planners*, Free Press, New York.

Morden, Tony and Bowles, David (1998), Management in South Korea: A Review, Management Decision; 36 (5).

Nutt, P.C. (1993) The Formulation Processes and Tactics Used in Organizational Decision Making, *Organization Science,* May, Vol.4, No.2.

Okoroafo, S. and Russow, L. (1993), Impact of marketing strategy on performance: empirical evidence from a liberalized developing country, *International Marketing Review,* 10 (1): 4-18.

Papadakis, V., and Barwise, P. (1998) *Strategic Decisions,* Kluwer Academic Publishers.

Porter, M.E. (1980) *Competitive Strategy: Techniques for Analyzing Industries and Competitors,* Free Press, NY.

Porter, M.E. (1996) What is Strategy?, *Harvard Business Review,* November-December, pp. 61-78.

Selmer, J. and de Leon, C. (1993), Chinese work values in Hong Kong, Singapore and Thailand, *International Journal of Commerce and Management*, 3 (3/4): 71-82.

Sheth, J. (1992), Emerging marketing strategies in a changing macroeconomic environment: a commentary, I*nternational Marketing Review*, Vol. 9: 423-38.

Sundaran, Jommo K. (1994), *Privatization in Malaysia's Economy in the Nineties*, Kuala Lumpur: Pelanduk Publications.

Suutari, R. (1999) Tale of Two Strategies: How Does Your Company Makes its Strategic Business Decisions?, *CMA Management,* Vol.73, July-August, pp. 12.

Syed Husin Ali (1997), Privatisation and Corporatisation in Malaysia: Meaning, Policy and Practice, *Utusan Konsumer*, 27 (9): Mid-May.

Thomas, H., and Pollock, T. (1999) From I-O Economics' S-C-P Paradigm through Strategic Groups to Competence-Based Competition: Reflections on the Puzzle of Competitive Strategy, *British Journal of Management,* Summer Issue, p.1.

Ulwick, A.W. (1999) *Business Strategy Formulation: Theory, Process, and the Intellectual Revolution,* Quorum Books.

Vanderberg, R.J., Richardson, H. and Eastman, L.J. (1999), The impact of high involvement work processes on organizational effectiveness: a second-order latent variables approach, *Group and Organization Management*, 24 (3): 300-339.

Vatikiptis, M. (1998), The Chinese Way, *Far Eastern Economic Review*, 26 (February): 45

Victor Wee (1998), National Economic Recovery Plan: Malaysia's Response to the Regional Financial Crisis. Consumers International, pp. 366-370. Consumers Association of Penang.

Wheelen, Thomas L., and Hunger, J. David (2002), *Strategic Management and Business Policy,* 8th edition,Prentice Hall-Pearson Education International, New Jersey.

Womack, J.P., and Jones, D.T. (1996) *Lean Thinking: Banish Waste and Create Wealth in Your Corporation,* New York: Simon and Schuster.

Wood, Elliot and Whiteley, Alma (2002), The Cross Model of Quanxi Usage in Chinese Leadership, *Journal of Management Development*, 21 (4): 263-271.

Xin, K.R. and Pearce, J.L. (1996), Guanxi: connections as substitutes for formal institutional support, *Academy of Management*, 39 (6): 1641-1658.

Yeung, H.W.C. (1998), *Transnational Corporations and Business Netwroks: Hong Kong Firms in the ASEAN Region,* Routledge, London.

Yeung, I.Y.M. and Tung, R.L. (1996), Achieving success in Confucian societies: the importance of *guanxi* (connections), *Organizational Dynamics*, 25 (2): 54-65.

Yu, Tony Fu-Lai (2001), The Chinese Family Business as a Strategic System: An Evolutionary Perspective, *International Journal of Entrepreneurial Behaviour and Research*, 7 (1).

Zeffane, R. (1992), Utility theory and organization design, *American Business Review*, 12 (1): 66-86.

A Study of Entrepreneurship Inclinations Among Board Members
of the Fishermen's Associations

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ABSTRACT

Entrepreneurship development is not only the process of creating enterprises but also to develop new values for the deprived sector such as fisheries. Entrepreneurship development has been the subject of extensive research in the developed world and a number of studies have also been conducted in the transition economies. However, entrepreneurship development especially entrepreneurship inclinations among board members of the fishermen's associations in the fishing sector has not been conducted extensively in Malaysia and is ripe for research. This paper reports preliminary findings on the attitude perspective of entrepreneurial inclinations among board members of the fishermen's associations. A structured questionnaire was developed from the academic literature and data gathered through in-depth interviews with board members and senior officers of the Fisheries Development Authority of Malaysia. Correlation analysis is used to examine the hypotheses. Our paper demonstrates that the work status, monthly income, work experiences, entrepreneurship and technical training and age have an influenced on entrepreneurial inclinations among board members of the fishermen's associations.

INTRODUCTION

The agriculture sector play an important role in the economic and social development of the nation as outlined under the National Agriculture Plan (DPN). In the earlier stages, agriculture provides food, employment and income to the people as the activity was traditional and self-sufficient in nature. One of the main activities of the agriculture sector is the fisheries sector. Fisheries play a significant role in contributing food supply to Malaysians. It contributed up to 1.57% to GNP, as well as job opportunities to 179,000 fishers and 20,000 fish breeders. For the past ten years, there has been sustainable and constant fisheries production of 80,000 tonnes yearly (Anonymous, 1996).

According to Abdul Aziz (2002), the fisheries sector in Malaysia still lacks the integration and comprehensiveness to become competitive compared to other countries such as Taiwan, Japan, Korea and China. It focuses more on the catching, landing and marketing of fish, but lagged behind in terms of managing the fish resources and processing of fish products. For the fisheries sector to become competitive with other developed countries, it must rejuvenate this sector into a fisheries-based industry for local consumptions as well as for export.

The establishment of the Fisheries Development Authority of Malaysia (LKIM) and Department of Fisheries under the Ministry of Agriculture and Agro-based Industry focus on the development and management of the fisheries sector in Malaysia. Among the objectives of LKIM are to improve the socio-economic well being of the fishermen's through its affiliation with the Fishermen's Associations. The Department of Fisheries play an important role in the research and development of the fisheries sector in order for the sector to be more dynamic and modern.

Entrepreneurship development has been the subject of extensive research in the developed world and a number of studies have also been conducted in the transition economies. However, entrepreneurship development especially entrepreneurship inclinations among board members of the fishermen's associations in the fisheries sector has not been conducted extensively in Malaysia and is ripe for research.

PROBLEM STATEMENT

The role of the Fishermen's Associations will be increasingly important as the nation attempts to move towards its goal of becoming a developed country by the year 2020 (Abdul Aziz, 2002). Two issues that are important in achieving this goal are the eradication of poverty and the restructuring of the society according to racial composition. In this aspect the role of the Fishermen's Associations is to involve with other parties to develop the nation fishing industry.

Figures have shown that the level of poverty among the fishers have been reduced from 70 percent in the early years of 1970's to 10 percent in the late 1990's. Even though this achievement can be considered encouraging, poverty is still relatively higher in terms of the household income of the fishers compared to the household income of non-fishers for example, manufacturing and services. The agenda for eradication of poverty still relevant and will continuously being carried out by the Fishermen's Association in the future.

From the perspective of restructuring the society such as the fishers' community, the achievement as a whole is quite discouraging. The need to create entrepreneurs among the fishers, small-medium sized fishers industries and the fishers having high technology, competent and modern still lagged behind in terms of quantity and performance. Therefore, the potential of achieving success will be greater on the ways to create investment opportunities, income and employment in the related fisheries industry.

In hoping to increase bumiputera participation in business, the Government must not only provide opportunities to qualified bumiputeras in undertaking various business courses and financial support in establishing their own businesses but also allow the same for Fishermen's Associations. They are the agent of development and the agent of change for the fishing community. Fishers through the Fishermen's Associations can undertake programmes run by The Fisheries Development Authority of Malaysia and the Department of Fisheries such as the Modern Fishermen's Fund, "Marinovation", "Independent Fishermen's", "Exit Plan" and Entrepreneurship Development. These projects are aimed primarily at the Fishermen's Association which acts as the delivery and mobilisation mechanism for its members.

Entrepreneurship development is an area that requires individuals with talent, knowledge, mental and physical resilience to face the many forms of problems that may arise in the business world. Aspiring entrepreneurs such as the Board Members[1] (including the General Managers) of the Fishermen's Associations need support not only in the form of advisory services but also in the form of financial facilities to enter the market that are already monopolized by non-fisheries businesses.

The board members of the Fishermen's Associations comprised mostly of people who have the necessary skills and the wealth of knowledge in fishing but lack the necessary skills in doing business and they depend much on the ability of the General Managers of the Associations to carry out the business. Furthermore, some proponents are stating that the Fishermen's Associations are focusing more on the economic and business activities that they neglected the social needs of the fishermen's. Therefore, serious social problems occurred and affected the well being of fishermen's in those areas. This fact was proven wrong whereby the Fishermen's Associations in developed countries are successful in carrying out their social obligation due to their Associations strength both in business and economy. Therefore, the philosophy of success for the Fishermen's Associations is that they must be strong in business/economy in order to carry out their social responsibility.

This study is to examine entrepreneurial inclinations among board members of the fishermen's associations in the fisheries sector and indirectly answer the question of the potential for them to go into business and entrepreneurship.

LITERATURE REVIEW

Previous research has proven a potential to create aspiring entrepreneurs in the various fields such as academicians and students (Louis, Blumenthal, Gluck & Stoto, 1989; Roberts, 1991; Hatten & Ruhlan, 1995; Barcelona & Valida, 1992). The approaches conducted by these researchers were based on several perspectives, such as using the personality/character, demographics and attitudinal approaches.

The personality theories are used in broad situation and are also included in measuring entrepreneurship inclinations. This approach frequently loss its effectiveness in measuring entrepreneurship inclinations whereby research conducted by Ajzen and Fishbein (1977), highlighted that the loss of its effectiveness in measuring entrepreneurship inclinations was due to the presence of increased margins of error related to all the situations that these instruments were used and also not linking to the research concept.

The demographic approach had its own problems in measuring entrepreneurial inclinations because it was prone to generalize individual groups within the population. Rychlak (1981) stated that future action was not influenced by demographic characteristics but more so by specific reactions to certain situations. In other words, entrepreneurial inclinations were determined by specific reaction to a situation and not by a set of common individual demographic characteristics.

Therefore, inherent weaknesses presented by these two approaches can be overcome by utilizing the attitudinal approach in identifying the entrepreneurial inclinations (Robinson, 1991). He stated that these two approaches

have their own shortcomings and are therefore inadequate and provide inaccurate results when measuring entrepreneurial inclinations.

The inclination of individual to get involve in the field of entrepreneurship is driven by a number of factors that can be categorized as a Push Factors and Pull Factors. The Push Factors incorporate frustration that inherited entrepreneurial culture. Frustration result from limited opportunities, economic downturn and dissatisfaction. Pull Factors incorporate psychology and profit. Individuals will be pushed into entering business as a result of the frustration faced due to limited job opportunities and social mobility. Economic downturn also causes individuals to be influenced in becoming entrepreneurs because of the lack of job opportunities in both the public and private sectors.

Another reason is for individuals who do not have job satisfaction in his/her present jobs either because of the job itself, unsatisfactory remuneration, conflicting with leadership or organization culture. This is thought to be inappropriate which may lead to entrepreneurship inclinations. For some individuals who are already in the group with rich entrepreneurship culture, continual socialization process with the support and help in the form of material and moral will directly or indirectly encourage that individual to enter business.

Psychological encouragement also makes individuals to become influenced by entrepreneurship. The individual ego to carry out something that is self-created and being an own boss may also lead to entrepreneurship inclinations. Apart from this, the drive to make a profit is a strong motivator for aspiring entrepreneur. The profit derived from business is seen by many to be much more than being a mere wage earner.

There are various other research conducted to study entrepreneurship inclinations, for example, of which is Crant (1996), which found that entrepreneurship inclinations can be linked to an individuals consideration of owning a business. This research conducted in a university in the United States highlighted that gender; educational level and parents who own businesses contribute towards influencing entrepreneurship inclinations. Cromie and O Donaghue (1992) presented an extract from Caird (1988a), which stated that entrepreneurship inclinations also referred to individual levels of entrepreneurship inclinations to establish and run projects. Caird (1988b) also concluded that entrepreneurship inclinations tended to rely on the need for autonomy, internal control locust, creativity, and risk taking and self-believe.

A research analysis conducted by Mazzarol, Doss and Thein (1999) on the sampling of 93 respondents among entrepreneurs in Western Australia found out that environmental factors such as social factor, economics, politics and infrastructure development and personality factors such as individual character and the background of the respondents influencing the drive to establish self-owned businesses.

Entrepreneurial character and nature owned by some individuals together with demographic factors have also been proven to have close relationships towards the inclination to become entrepreneur by establishing new businesses. Past research has also shown that the interest of various demographic variables such as personality, human capital, ethnicity, marital status, educational level, family size, work status and experience, age, gender, socio-economics status, religion and nature of personality contribute towards establishing a business (Mazzarol *et al.*, 1999). Entrepreneur characteristics inherent in someone may be linked with the inclination to establish a business as presented by researchers such as McClelland (1961) (need for achievement), Brockhaus (1982) (inclination to take internal self control risk), Schere (1982) (compromising with uncertainty), Greenberger and Sexton (1998) (need for personal control). However there are background factors which relate to individual personality such as previous employment (Ronstadt, 1985), family background (Matthews & Moser, 1996), gender (Buttner & Rosen, (1989), education (Storey, 1982) and ethnicity (Aldrich, 1980) which is also linked to the inclination to establish a business. Geographical factors and outside assistance also play a role in influencing the formation of new business by those who posses entrepreneurial characteristics (Chrisman, 1999).

Entrepreneurship inclinations can be associated with five main factors such as personal elements/traits factor (need for achievement, internal control, taking risk), personal environmental factor (family status, gender and having business-owning family), personal objective factor (being the owner of business, financial guarantee and vision), business environment factor (competition, societal attitudes towards new businesses and the accessibility of loan) and business idea factor (Naffziger, Hornby & Kuratko, 1994). Research conducted by Mazzarol *et al.,* (1999) on a group of West Australian entrepreneurs concerning the demographic factor such as age, educational level, ethnicity, gender, previous work experience, jobless rate, residing location and family business experience and self-employment in relation to inclination to set up own business. Research conducted by Crant (1996) on a group of first year undergraduates (91) and degree holders (90) found that entrepreneurship inclination among the respondents had significantly high relationships with gender, education, family with business interest and a personal proactive attitude.

In a comparative study conducted by Cromie and O Donaghue (1992) on 194 managers and 661 first year degree undergraduate students with a group of entrepreneurs found that managers had high entrepreneurship inclinations by exhibiting characteristics and the nature for achievement, internal self control, need for autonomy, creativity, risk taking as well as higher self confidence when compared with the first year undergraduate. Research conducted by Matthews and Moser (1996) on 89 ex-business administration students found that gender and families with own businesses influenced entrepreneurship inclinations among the respondents. This situation was the same with research conducted by Scherer and Brodzinski (1990), which found gender, influenced choice of entrepreneurship career among the respondents. The responsibility factor also influenced individuals when indulging in the field of entrepreneurship. This was also proven by a research conducted by Buttner and Moore (1997) on 129 professional women and executives who have left their careers in major firms to become entrepreneurs by establishing their own companies. This course of action was taken to fulfil movement factors (motivation) such as challenge, personal needs as well as balancing family and social responsibilities.

Other than the factors stated above, the factor of actually going through a relevant programme also influenced an individual in becoming an entrepreneur. This was further substantiated by the research conducted by Hatten and Ruhland (1995) on 220 college students who were following a programme sponsored by the Small Business Institute in USA. This research found that the students with inclinations to become entrepreneurs was higher after competing the programme and it could be linked to high internal self control as well as age. Research conducted by Barcelona and Valida (1992) on 800 final year students at Northern University of Malaysia also found significant correlative existence between the respondents' personality and the characteristics of entrepreneurial inclinations. For technical entrepreneurs who have worked as university lecturers and researchers the elements such as family background, objective orientation, motivation and personality, work experience, education and age could be linked to the decision in becoming technical entrepreneurs (Roberts, 1991). Research by Louis *et al.* (1989) on lecturers at the Life Sciences Faculty at various universities in the United States found that age and gender are factors that can influence lecturers into becoming academic entrepreneurs.

RESEARCH HYPOTHESIS

Based on findings of past researches and theoretical frameworks, the hypotheses presented in this analysis are:

H1: No significant difference between the attitude of entrepreneurship inclinations and the work status of the respondents.

H2: No significant different between the attitude of entrepreneurship inclinations and the monthly income of the respondents.

H3: No significant different between the attitude of entrepreneurship inclinations and the respondents's work experiences.

H4: No significant different between the attitude of entrepreneurship inclinations and the entrepreneurial courses attended by the respondents.

H5: No significant different between the attitude of entrepreneurship inclinations and the respondents who have had business experience.

H6: No significant different between the attitude of entrepreneurship inclinations and the age of respondents.

RESEARCH METHODOLOGY

This research-design applied the method of cross sectional survey using questionnaires, which were distributed to the board members and managers of the Fishermen's Associations. Questionnaires are divided into three (2) parts. Part A consisted of questions that relate to the respondent's background and his job experience and also business or entrepreneurial courses or seminar that he has attended. While Part B consisted of seventy-five (75) questions which include main component of attitudes i.e. affective, cognitive and co native and four sub-scales that are linked to the attitude of entrepreneurship which are innovation, internal locust of control, self-esteem and the need for achievement. A sample size of 269 respondents selected from the total population of 897 based on stratified random sampling method (Krejcie & Morgan, 1970). A total of 246 respondents (91.4%) returned their questionnaire forms.

RESEARCH FINDINGS

Reliability Test Result

To determine the reliability of the responses given by the respondents, a reliability test was conducted to the dependent variable (entrepreneurship inclinations). Based on the result of the test the alpha value of 0.938 was obtained (Table 1). This shows that the responses given by the respondents were highly reliable as the Reliability Coefficient is closer to 1 (one).

Table 1: Test Result of the Reliability Analysis of the Responses

Reliability Coefficients	
N of Cases = 171	N of Items = 75
Alpha = 0.938	

Demography of Respondents

The findings of the research demographically indicated that the majority of respondents were Malays, married, with incomes ranging from RM500 to RM1,000, having less than 15 years of service, having a family member from fisheries sector, having attended business and technical courses/seminars or workshop (Table 2, p. 7).

Table 2: Demographic Distribution of Respondents

DEMOGRAPHY:	FREQUENCY	PERCENTAGE
AGE:		
40 YEARS AND BELOW	37	15.0
41 - 50 YEARS	105	42.7
51 - 60 YEARS	83	33.7
61 YEARS AND ABOVE	21	8.5
EDUCATION LEVEL:		
COMPLETED PRIMARY SCHOOL	117	47.6
PMR	39	15.9
SPM	44	17.9
STPM	18	7.3
DIPLOMA	14	5.7
DEGREE	7	2.8
OTHERS	7	2.8
RACE:		
MALAYS	230	93.5
CHINESE	7	2.8
OTHERS	9	3.7
MONTHLY INCOME:		
LESS THAN RM500	66	26.8
RM501 – RM1,000	84	34.1
RM1,001 – RM1,500	24	9.8
OVER RM1,500	64	26.0
NOT STATED	8	3.3
MARITAL STATUS:		
MARRIED	237	96.3
SINGLE	5	2.0
DIVORCED	4	1.6
YEARS OF SERVICE:		
LESS THAN 6 YEARS	125	50.8
6 – 10	65	26.4
11 – 15 YEARS	34	13.8
OVER 15 YEARS	14	5.7
NOT STATED	8	3.3
BACKGROUND OF FAMILY MEMBERS		
FISHERIES	154	62.6

AGRICULTURE	48	19.5
BUSINESSES	14	5.7
INDUSTRY	1	0.4
OTHERS	14	5.7
NOT STATED	15	6.1
ATTENDED ENTREPRENEURSHIP COURSES		
YES	155	63.0
NO	91	37.0
ATTENDED TECHNICAL COURSES		
YES	136	55.3
NO	110	44.7

HYPOTHESIS TESTING

In order to verify the hypotheses, ANOVA One-way Test was chosen. The test was carried out to ensure whether alternative hypothesis (Ha) were to be accepted or rejected. ANOVA One-way test was done to the dependent variable and the independent variable which have more than two item factors (work status, educational factor, age, monthly income), or which have two item factors (have/not having attended entrepreneurship courses and have/not having attended technical training courses). The purpose of the ANOVA one-way Test was to determine whether there was significant difference between the dependent variable and the independent variable.

To measure the hypothesis, probability level of 0.05 (95%) was chosen. Thus the acceptance or rejection of the alternative hypothesis was based on this probability level. The presence of significant different between work status and entrepreneurship inclinations was evidenced from the analysis (Table 3). Higher mean value registered from respondents having monthly income or respondents involved in day- to- day operation of the businesses indicate greater inclinations towards entrepreneurship. Other demographical aspects such as having attended entrepreneurial courses, technical courses, and age also show significant difference towards having strong entrepreneurial inclination.

Table 3: One-way ANOVA Test to Compare/Differentiate Factors of Work Status, Monthly Income, Work Experiences, Entrepreneurship Courses, Technical Courses, Age and Entrepreneurship Inclinations

		SUM OF SQUARE	df	MEAN SQUARE	F	Sig.
WORK STATUS	BETWEEN PEOPLE	2103.4202	165	12.7480	54.3426	0.0000*
	WITHIN PEOPLE	17781.5132	12450	1.4282		
	TOTAL	19884.9334	12615	1.5763		
MONTHLY INCOME	BETWEEN PEOPLE	4277867.2435	170	25163.9250	152.3970	0.0000*
	WITHIN PEOPLE	609433956.2237	12825	47519.2169		
	TOTAL	613711823.4671	12995	47226.7659		
WORK EXPERIENCES	BETWEEN PEOPLE	2363.8395	163	14.5021	173.7648	0.0000*
	WITHIN PEOPLE	52035.1053	12300	4.2305		
	TOTAL	54398.9448	12463	4.3648		
ENTREPRENEURSHIP COURSES ATTENDED	BETWEEN PEOPLE	1119.8157	94	11.9129	116.3164	0.0000*
	WITHIN PEOPLE	28238.1154	7315	3.8603		
	TOTAL	29357.9310	7409	3.9625		
TECHNICAL COURSES	BETWEEN PEOPLE	1126.9734	93	12.1180	113.5863	0.0000*
	WITHIN	27690.3462	7238	3.8257		

ATTENDED	PEOPLE TOTAL	28817.3196	7331	3.9309		
AGE	BETWEEN PEOPLE	2252.3657	169	13.3276	2702.8957	0.0000*
	WITHIN PEOPLE	354820.6447	12750	27.8291		
	TOTAL	357073.0104	12919	27.6394		

*p<0.05

DISCUSSION

On the whole the study revealed that the entrepreneurial inclinations among board members of the Fishermen's Associations in the fisheries sector were high. The results of the study showed that a majority of the respondents have experience actively in business. This statement was based on the findings, which showed that 63.0 percents of the respondents have attended entrepreneurship courses while 37.0% percents have not attended entrepreneurship courses. The outcome of this study however corresponded well with that of Mazzarol *et al.*, (1999) which found that staff that lacked work experience has low entrepreneurial inclinations.

This study showed that respondent's monthly income was a factor that stimulated inclination towards entrepreneurship. A study done by Buttner and Moore (1997), found that the condition where a person was subjected to opportunities to earn more would be a factor to motivate or inspiring him/her to establish or be involved in entrepreneurial and business activities.

This study also showed that respondents that have attended courses on entrepreneurship show inclinations to be involved in this field. Result of this survey supported the findings made by Hatten and Ruhland (1995) who found that participants of entrepreneurial courses conducted by "Small Business Institute" showed inclinations to become entrepreneurs.

Apart from what that has been mentioned above, this study also found that the age of the respondent was a factor that could motivate individual to exhibit entrepreneurship inclinations. The finding thus corresponds with a study conducted by Louis *et al.* (1989) that found that age factor has direct correlations with inclinations towards becoming entrepreneurs.

This research therefore highlighted all these factors that influenced and triggered entrepreneurship inclinations among board members of the Fishermen's Associations. Based on the preliminary findings suggested that these Fishermen's Associations are running their own businesses that involved in processing of fish products, selling diesels, marketing of fish agro-tourism. This could create a situation, which trigger inclinations towards entrepreneurship or the potential to establish more businesses for its members.

Note: The term Board Members of the Fishermen's Associations comprised of the General Managers and the fishermen's elected by the its members.

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REFERENCES

Abdul Aziz Abdul Rahman (2002). Konvensyen Persatuan Nelayan 2002, Lembaga Kemajuan Ikan Malaysia, Kuala Lumpur.

Ajzen, L. & Fishbein, M. (1977). Attitude-behaviour Relations: A Theoretical Analysis and Review of Empirical Research, *Psychological Bulletin,* 84: 888 – 918.

Aldrich, H. (1980). Asian Shopkeepers As A Middleman Minority: A Study of Small Business in Wandsworth, Evans, A. & Eversley*, D. (eds.), The Inner City: Employment and Industry* (pp389-407), London: Heinemann.

Anonymous. (1996). *Penang Development News*, Penang Development Corporation (PDC), Penang, Malaysia, January – March, 1996.

Barcelona, A.C, and Valida, A.C. (1992). Interrelationship Between Personal Variables and Entrepreneurial Potentials of Senior Students of Universiti Utara Malaysia, *Malaysian Management Review*, 29(4): 15 – 28.

Brockhous, R.H. (1982). The Psychology of Entrepreneur*, Encyclopaedia of Entrepreneurship*, New Jersey: Prentice Hall.

Buttner, E.H., & Moore, D.P. (1997). Women's Organizational Exodus to Entrepreneurship: Self-Report Motivations and Correlated with Success*, Journal of Small Business Management,* 35(1): 34 – 46.

Buttner, E.H., & Rosen, B. (1989). Funding New Business Ventures: Are Decision Makers Biased Against Women Entrepreneurs?, *Journal of Business Venturing*, (4): 249-261.

Caird, S. (1988a). *Review Of Methods Of Measuring Enterprise Attributes*. Unpublished Paper, Durham University Business School.

Caird, S. (1988b). *Report On The Development And Validation Of A Measure Of General Enterprising Inclination*, Unpublished Paper, Durham University, Business School.

Chrisman, J.J. (1999). The Influence of Outsider – Generated Knowledge Resource on Venture Creation, *Journal of Small Business Management,* 37(4): 42 – 58.

Crant, J.M. (1996). The Proactive Personality Scale as A Predictor of Entrepreneurship Intention, *Journal of Small Business Management*, 34(3): 42 – 49.

Cromie, S., & O Donoghue, J. (1992). Assessing Entrepreneurial Inclinations, *International Small Business Journal,* 10(2): 66 – 70.

Greenberger, D.B., Sexton, D.L. (1988). An Interactive Model for New Venture Creation*, Journal of Small Business Management*, 26 (3): 107-18.

Hatten, T.S., & Ruhland. S.K. (1995). Student Attitude Toward Entrepreneurship As Affected by Participation in an SBI Program, *Journal of Education For Business*, 70(4): 224 – 227.

Krejcie, R.V., & Morgan, D.W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement,* 30: 607-610.

Louis, K.S,, Blumenthal, D., Gluck, M.E & Stoto, M.A. (1989). Entrepreneur in Academe*: An Exploration of Behaviours Among Life Scientist,* 34(1): 110 – 113.

Mathews, C.H., & Moser, S.B. (1996). A Longitudinal Investigation of the Impact of Family Background and Gender on Interest in Small Firm Ownership, *Journal of Small Business Management,* 34(2): 29 – 43.

Mazzarol, T., Doss, N., & Thein, V. (1999). Factors Influencing Small Business Start-Up, *International Journal of Entrepreneur Behaviour and Research,* 5(2): 48 – 63.

McClelland, D.C. (1961). *The Achieving Society*, Princeton, NJ: Van Nostrand.

Naffziger, D.W., Hornby, J.S. & Kuratko D.F. (1994). A Proposed Research Model of Entrepreneurial Motivation, *Entrepreneurship Theory and Practice,* 17(1): 49 – 55.

Roberts, E.B. (1991). *Entrepreneur in High Technology: Lessons from MIT and Beyond*, New York: Oxford University Press.

Robinson, P.B. (1991). An Attitude Approach to the Prediction of Entrepreneurship*, Entrepreneurship Theory & Practice,* Summer, 15(4): 13 – 30.

Ronstadts, R.C. (1985). The Educated Entrepreneur: A New Era of Entrepreneurial Education Beginning, *American Journal of Small Business,* Vol. 10 (1): 7 – 23.

Rychlak, J.F. (1981). *Introduction to Personality and Psychotherapy:A Theory-Construction Approach (2nd Ed)*, Boston: Houghton Mifflin.

Schere, J. (1982). Tolerance of Ambiguity As A Discriminating Variable Between Entrepreneurs and Managers. *Proceedings of the Academy of Management*, 42: 404–408.

Scherer, R.F. & Brodzinski, J.D. (1990). Entrepreneur Career Selection and Gender. A Socialization Approach, *Journal of Small Business Management,* 15(4): 37 – 44.

Storey, D.J. (1982). *Entrepreneurship and the New Firm*, Kent: Beckenham.

Validating a Retail Service Quality Instrument in Apparel Specialty Stores

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ABSTRACT

The last few years have witnessed a growing number of retail service quality measurement studies, albeit in various cultures and different settings. This paper looks at validating the retail service quality instrument developed by Dabholkar et al. (1996) in the Malaysian business setting, specifically in the context of apparel specialty stores. Two well-known retail clothing store chains were selected for this study. Findings obtained from the confirmatory factor analysis and reliability tests indicated that all the five dimensions of physical aspects, reliability, personal interaction, problem-solving and policy are highly suited for measuring retail service quality in clothing stores, also proving that the instrument is applicable in the Malaysian culture. Through the correlation analysis, it was shown that retail service quality is furthermore associated with future consumption behaviour in terms of the customers' intention to visit, purchase and recommend the stores to others. Implications of this retail service quality scale for practitioners are included in this paper.

INTRODUCTION

As the local retailing industry continues to experience tremendous expansion, one observation is clearly evident: the rapid growth in the number of apparel or clothing specialty stores. Fashion retailing in Malaysia is poised to reach its height with recent openings of massive-sized shopping centers in the Kuala Lumpur and Klang Valley region such as One Utama Phase 2, Ikano Power Centre and Berjaya Times Square. These new malls house a proliferation of clothing retailers, both domestic and foreign, all of which aggressively vie for the consumers' attention. Considering the competitive environment, there is a need for a retailing strategy that differentiates one clothing store from another. This can be achieved through the delivery of high service quality (Berry, 1986; Hummel & Savitt, 1988). Moreover, fashion consumers today are savvier, better informed, more sophisticated and discriminating (Leung & To, 2001) that they expect service quality (e.g. helpful and courteous salespeople, convenient store layout,etc) apart from the quality of merchandise purchased. The practice of excellent service quality has been proven to lead to increased customer satisfaction (Sivadas & Baker-Prewitt, 2000) and significantly indicate the effectiveness of the retailers' performance. As service quality can be the cornerstone to retailing success, retailers need to constantly evaluate their service quality through the use of a reliable measuring instrument. Such an evaluation can serve as a diagnostic tool that helps the company monitor, detect any imperfections and most importantly improve their service.

PREVIOUS WORKS ON SERVICE QUALITY MEASUREMENT

The origins of numerous instruments measuring service quality can perhaps be traced back the pioneering work of Parasuraman et al. (1988) who developed the widely popular scale termed as SERVQUAL to evaluate service quality. According to the developers of SERVQUAL, service quality is derived from a comparison between customer expectations and customer perceptions of actual service performance. The difference between perceptions and expectations results in the service quality gap (Q = P-E), also known as GAP 5 (Parasuraman et al., 1985; 1988). A wide gap would represent poor service quality and shows that the service provider needs to improve on the service offered to its customers. Parasuraman et al.'s (1988) study also suggested that five dimensions namely, tangibles, reliability, assurance, responsiveness and empathy, influence service quality perceptions.

Since its introduction, SERVQUAL has spawned many other studies undertaken by both academicians and practitioners alike. It has been tested and applied in diverse service settings which includes hospitals (Babakus & Mangold, 1989), a dental school patient clinic, business school placement centre, tire store and acute care hospital (Carman, 1990), a utility company (Babakus & Boller, 1992), banking, pest control, dry cleaning and fast food (Cronin & Taylor, 1992), and banking industries (Lassar et al., 2000; Zhu et al., 2002). Recently, SERVQUAL has also been expanded and applied to internet retailing (Trocchia & Janda, 2003; Long & McMellon, 2004). Even so, the scale itself possesses some serious shortcomings that limit its usefulness (Brown

et al., 1993). For example, the generalizability of the SERVQUAL dimensions across different service settings is severely doubted (Siu & Cheung, 2001) as most of the studies demonstrated a poor fit of the five-factor structure posited by Parasuraman et al. (1988).

Furthermore, much controversy has risen on the necessity and appropriateness of operationalizing service quality as an expectations-perceptions gap score (Carman, 1990; Bouman & Van der Wiele, 1992). In actual fact, perceptions-only measure seems to be more realistic and applicable. Indeed, this has been supported by Cronin and Taylor (1992) who claimed that their perception-only measure of service quality (SERVPERF) was far more superior than the traditional SERVQUAL because the scale provided a more construct-valid explanation to service quality due to their content and discriminant validity.

Apart from this, concern has also been expressed over the length of the SERVQUAL questionnaire. Respondents may end up either bored or confused having to answer a 22 expectations item and 22 perceptions item scale, and this can certainly affect the quality of data obtained (Bouman & Van der Wiele, 1992; Siu & Cheung, 2001). Taking into account the many comments and criticisms, Parasuraman et al. (1991; 1994) later reassessed and refined SERVQUAL.

RETAIL SERVICE QUALITY

Despite the fact that SERVQUAL has been empirically tested in various studies involving "pure" service settings, it has not been proven to be successfully applied in a retail setting (Dabholkar at al., 1996; Mehta et al., 2000) and also more specifically, in apparel specialty stores. Service quality in "pure" service settings and retail settings differ in the sense that quality is seen from the perspective of not only services but goods as well. Measuring service quality, therefore, can be rather complicated and difficult especially in apparel specialty retailing where it combines the selling of goods and services to the customers as well as the customers' expectations of knowledgeable, helpful staff to assist them during their shopping experience (Gagliano & Hathcote, 1994).

The need for a measurement instrument that can accurately assess service quality in a retail environment was answered by Dabholkar et al. (1996) who developed and empirically validated a scale to measure retail service quality distinctively. In developing the instrument, the researchers conducted a triangulation of research techniques involving interviews with several retail customers, in-depth interviews with six customers and a qualitative study that monitored the thought process of three customers during an actual shopping experience. These three differing methods combined with a review of service quality related literature and some modification to the original SERVQUAL scale produced a hierarchical factor structure scale which Dabholkar et al. (1996) aptly named as the Retail Service Quality Scale (RSQS). According to Dabholkar et al. (1996), retail service quality had a hierarchical factor structure which comprised of five basic dimensions. The five dimensions proposed were:

i.   Physical aspects – includes functional elements like layout, comfort and privacy and also aesthetic elements such as the architecture, colour, materials and style of the store.
ii. Reliability – a combination of keeping promises and performing services right.
iii. Personal interaction – the service personnel being courteous, helpful, inspiring confidence and trust in customers.
iv. Problem-solving – the handling of returns and exchanges as well as complaints.
v.   Policy – a set of strategies, procedures and guiding principles which the store operates under such as high quality merchandise, convenient operating hours, availability of parking spaces and payment options.

Apart from Dabholkar et al.'s (1996) contribution, there are also other studies by numerous authors relating to this area, many of which replicated the RSQS in their own culture and research settings. Table 1 presents a brief look at several service quality studies in the retail environment.

Table 1: Summary of Several Studies on Retail Service Quality Measurement

Authors	Research setting(s)	Study sample(s)	Instrument	Analysis	Factor structure or other key findings
Gagliano & Hathcote (1994)	Southeastern USA	Customers of specialty clothing stores	Refined SERVQUAL scale (Parasuraman et al., 1991)	Principal axis factor analysis followed by oblique rotation	The five-factor structure used in this study was reduced to four factors.
Dabholkar et al. (1996)	Southeastern USA	Customers of seven selected stores from two department store chains	The authors' own scale known as Retail Service Quality (RSQS) which they developed to suit the retail environment after making some modifications to SERVQUAL	Confirmatory factor analysis with partial disaggregation	A hierarchical factor structure was proposed comprising of five dimensions, with three of five dimensions having two subdimensions each and overall service quality as a second-order factor.
Christo & Terblanche (1997)	South Africa	Hypermarket shoppers	RSQS (Dabholkar et al., 1996)	Confirmatory factor analysis	Hierarchical factor structure. The five-factor structure of retail service quality dimensions suggested by Dabholkar et al. (1996) resulted in a reasonable fit.
Mehta et al. (2000)	Singapore	Customers of supermarkets and electronic goods retailers	RSQS (Dabholkar et al., 1996) and SERVPERF (Cronin & Taylor, 1992)	Reliability, correlation, regression and factor analysis	RSQS was discovered to be more suited in a "more goods, less services" environment, i.e. a supermarket, while SERVPERF was better for a retailing context where the service element is prevalent. A modified scale resulting from a combination of RSQS and SERVPERF was developed. Five new factors were identified from this modified scale.
Leung & To (2001)	Hong Kong	Undergraduate students who were shoppers at fashion stores	A 34-item scale developed by Leung & Fung (1996) for measuring service quality specifically in fashion chain stores	Reliability and correlation analysis	The scale, comprising of five factors, possessed high internal consistency but low temporal stability.
Siu & Cheung (2001)	Hong Kong	Customers of five stores from a multinational department store chain	RSQS (Dabholkar et al., 1996)	Principal component factor analysis with varimax rotation	Six factors emerged as opposed to the five-factor structure suggested in RSQS.
Kim & Jin (2002)	USA and Seoul, Korea	College students who were shoppers of discounts stores	RSQS (Dabholkar et al., 1996)	Confirmatory factor analysis with partial disaggregation	A three-factor structure was found. The RSQS presented a better fit for the US sample than the Korean consumers.
Kim & Stoel (2004)	USA	Female online apparel shoppers	Loiacono's WebQual scale which evaluates the website quality	Confirmatory factor analysis	WebQual's 36 items converged into 12 distinct dimensions (first order factors). Findings did not support Loiacono's five-dimensional second-order factor structure or the authors' own proposed six-dimensional second-

order factor
structure.

OBJECTIVE OF THE STUDY

Our primary aim is to examine the generalizability and applicability of the retail service quality scale (RSQS) proposed by Dabholkar et al. (1996) in different research settings, for this case, in a Malaysian business setting. We aspire to test the applicability of the above-mentioned scale particularly in apparel specialty stores. The last few years have witnessed a growing number of RSQS replication studies, albeit in various cultures and settings. Thus, it has also become our goal to expand the existing literature available in this area of retail service quality. Apart from this, local studies on instrument validation have been found lacking, despite efforts undertaken by some authors like Ramayah et al. (2001; 2004) whose works focused on measuring job satisfaction and e-readiness. Therefore, we hope that the findings of this research will also contribute to the somewhat limited studies on instrument validation or scale refinement in Malaysia.

METHODOLOGY

Two retail clothing store chains, X and Y were selected for this study based on a number of reasons. Both X (a local brand) and Y (a Hong Kong originated brand) are well-known fashion labels among Malaysian shoppers. They sell casual and comfortable apparel ranging from cottonwear, denim, khakis and knitwear as well as accessories targeted at the younger generation of consumers from the ages of 15 to around 30. Over the years, their strategies of providing quality and value-priced fashion apparel has certainly paid off as both X and Y have emerged into immensely successful retailers today as well as close rivals competing for the casual apparel market share. The image of good merchandise and service quality has been observed to be consistent throughout the store chains. Perhaps through this study we can gain some valuable insights on excellent service delivery from these retailers.
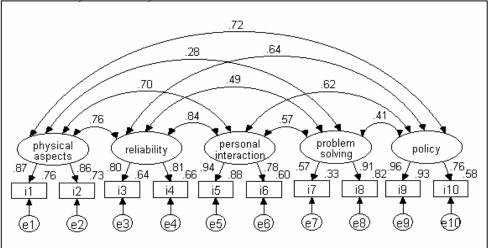
Customers of all X and Y's chain stores in Penang (both mainland and island) were involved in this study. The method of purposive sampling was employed whereby the respondents had to fulfill the criteria of having visited the stores before even if they had not made any purchases. The questionnaires were personally hand-delivered in workplaces, homes, educational institutions and shopping complexes, as distributing the questionnaires within the stores' premises was not allowed by the stores' management. Data was collected over a period of three weeks in the month of August coinciding with the Malaysian Mega Sales season. This increased the chances of the respondents patronizing the retail stores. A total of 211 responses were obtained, with female respondents (73%) greatly outnumbering the male respondents (27%). Majority of the shoppers were between the ages of 20 to 24 years.

MEASURES

The validated Retail Service Quality Scale (RSQS) which was developed by Dabholkar et al. (1996) was utilized in this study. There are altogether 28 items in the RSQS whereby 17 items originated from the SERVQUAL scale while the remaining 11 items, which were believed to be related to retailing, were added in by Dabholkar et al. (1996). Another additional 3 questions were included in the questionnaire pertaining to the customers' future intentions to shop, purchase and recommend the stores to their friends with the objective of assessing the predictive validity of the RSQS. Responses to all the statements in the questionnaire were measured on a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. Demographic information such as gender, age, ethnicity, education level and income was also collected.

ANALYSIS AND FINDINGS

Figure 1: Confirmatory Factor Analysis on the Five Basic Dimensions

KEY:
i_1 = P1 + P3 + P5 i_6 = P13 + P16 + P18 + P20
i_2 = P2 + P4 + P6 i_7 = P21 + P23
i_3 = P7 + P9 i_8 = P22
i_4 = P8 + P10 + P11 i_9 = P24 + P26 + P28
i_5 = P12 + P14 + P15 + P17 + P19 i_{10} = P25 + P27
Note: A listing of the 28 item measures used in this study is included in the Appendix.

CONFIRMATORY FACTOR ANALYSIS

Structural equation modeling using AMOS 4.0 was used to test the retail service quality model proposed in Figure 1. Confirmatory factor analysis with partial disaggregation was performed on the five basic dimensions of retail service quality. The partial disaggregation technique was applied instead of the traditional structural equations approach (or total disaggregation). Although the traditional total disaggregation technique provides the most detailed analysis for construct testing (each item is used as a separate indicator of the relevant construct), it has a tendency to be cumbersome due to potentially high levels of random error in typical items and the many parameters that must be estimated.

In contrast, partial disaggregation "allows one to proceed with meaningful research by combining items into composites to reduce higher levels of random error and yet it retains all the advantages of structural equations, including accounting for measurement error, allowing for multiple, multidimensional variables and testing for hierarchical factor structures." (Dabholkar et al., 1996: 9). To operationalize partial disaggregation in this study, items that relate to a given construct (dimension) were combined as suggested by Dabholkar et al. (1996) to create two composite indicators for each construct instead of several single-item indicators. The factor loadings and covariances obtained from the confirmatory factor analysis are as shown in Figure 1.

The scores obtained from the analysis suggested an excellent fit between the data and the model $(\chi^2 = 64.878$, *df* = 25, AGFI = 0.882, CFI = 0.966, RMSEA = 0.087). All the fit indices comply with the values recommended by Hair et al. (1998) and Arbuckle and Wothke (1995) except for the chi-square/degrees of freedom. Nevertheless, its score of 2.595 is still acceptable according to Segars and Grovers (1993) who suggested a value of less than 3.00. Table 2 summarizes the results of this analysis together with the recommended values by several scholars.

Table 2: Fit Statistic in the Structural Equation Model

Goodness-of-fit model index	Recommended Value*	RSQS model
Chi-square/degree of freedom***)	≤ 2.00	2.595
Goodness-of-fit index	≥ 0.90	0.946
Adjusted goodness-of-fit index (AGFI) **	≥ 0.90	0.882
Normalized fit index (NFI)	≥ 0.90	0.946
Tucker-Lewis index (TLI)	≥ 0.90	0.938
Comparative fit index (CFI)	≥ 0.90	0.966
Root mean square error of approximation (RMSEA)	≤ 0.08	0.087

* These criterias are according to Hair et al. (1998) and Arbuckle and Wothke (1995)
** Segars and Grover (1993) recommend chi-square/degrees of freedom value of ≤ 3.00

Based on the results obtained, it is evident that the model is well supported, thus we can conclude that all the five dimensions tested appear to be highly suited for measuring retail service quality, particularly in specialty clothing stores.

RELIABILITY AND VALIDITY RESULTS

Construct reliabilities were computed for the overall scale as well as at the dimension level. The results of the test indicated that the retail service quality scale proposed by Dabholkar et al. (1996) is a very much reliable instrument, registering an overall Cronbach alpha value of 0.93. All of the dimensions except for problem solving (which returned a coefficient of 0.62) also recorded coefficient alphas above 0.70, adhering to the minimum value of 0.70 suggested by Nunnally (1978). Nonetheless, the coefficient for problem-solving is still considered to be satisfactory as it is over 0.6 (Malhotra, 1993). Hence, the internal consistency reliabilities of the measures used in this study were all acceptable.

Next, the validity of the instrument is assessed using three methods; content validity, criterion related validity and discriminant validity. Content validity refers to the degree which an instrument covers the meaning of the concepts included in a particular research (Babbie, 1992). For this study, the content validity of the proposed instrument is adequate enough because the instrument has been carefully constructed, validated and refined by Dabholkar et al. (1996), supported by an extensive literature review.

Data was collected on three dependent variables – intention to visit, intention to purchase and intention to recommend the store to others with the purpose of assessing the criterion related validity of the retail service quality scale. Criterion related validity concerns the extent to which the constructs measured are related to a pre-specified criteria (Saraph et al., 1989). In this study, criterion related validity was determined using correlations between the overall scale, the individual dimensions and the three dependent variables. The results presented in Table 3 shows that the entire scale is highly correlated with the three intentions to visit (0.59, $p<0.05$), purchase (0.5, $p<0.05$) and recommend the stores (0.62, $p<0.05$), thus verifying the predictive validity of the RSQS. Based on Table 3 also, strong positive correlations can be traced for all the underlying dimensions except between problem solving and the intention to visit (0.16, $p<0.01$) and purchase (0.15, $p<0.01$).

Table 3: Construct Reliability and Criterion Related Validity of the Retail Service Quality Scale

| | No.of items | Construct Reliability | Criterion Related Validity with correlations | | |
			Intention to visit	Intention to purchase	Intention to recommend
Overall scale	28	0.93	0.59**	0.5**	0.62**
Dimensions					
Physical aspects	6	0.84	0.60**	0.47**	0.46**
Reliability	5	0.78	0.45**	0.42**	0.49**
Personal interaction	9	0.85	0.49**	0.38**	0.55**
Problem-solving	3	0.62	0.16*	0.15*	0.31**
Policy	5	0.82	0.53**	0.45**	0.54**

* $p<0.05$, ** $p<0.01$

Further to that, we also endeavoured to test the discriminant validity of this instrument. Discriminant validity gauges the extent to which measures of 2 different constructs are comparatively distinctive from each other, and

that their correlation values are neither an absolute value of 0 nor 1 (Campbell and Fiske, 1959). A correlation analysis was run on all the dimensions of retail service quality and the results are as presented in Table 4. It is found that all the dimensions are not perfectly correlated as their correlation coefficients fall between 0 and 1, hence establishing the discriminant validity of the RSQS.

Table 4: Correlation results

	Physical aspects	Reliability	Personal interaction	Problem-solving	Policy
Physical aspects	1.000				
Reliability	0.623**	1.000			
Personal interaction	0.587**	0.695**	1.000		
Problem-solving	0.114*	0.330**	0.428**	1.000	
Policy	0.624**	0.552**	0.520**	0.246**	1.000

*$p<0.05$, ** $p<0.01$

DISCUSSION AND IMPLICATIONS

This research has actually set out to validate the Retail Service Quality Scale developed by Dabholkar et al. (1996) in the Malaysian business setting, predominantly in the context of apparel specialty stores. The findings obtained from the confirmatory factor analysis and reliability tests indicated that all the five dimensions of physical aspects, reliability, personal interaction, problem-solving and policy are highly suited for measuring retail service quality, particularly in clothing stores, thereby supporting Dabholkar et al.'s (1996) claim that their instrument is appropriate for studying retail businesses that offer a mix of services and merchandise, such as departmental and specialty stores, supermarkets, hypermarkets, discount stores and the like. The measurement scale has proved to be applicable in another culture other than the US, namely Malaysia.

Retail service quality is also highly associated with future consumption behaviour in terms of the customers' intention to visit, purchase and recommend the store to family and friends. All the underlying dimensions of service quality play a role in stimulating repeated store patronage and the spread of good word-of-mouth. However, it is noteworthy to point out that problem solving did not record strong positive correlations as compared with the other dimensions when it came to intention to visit and purchase although it was significantly related to those two intentions. A possible explanation could be that Malaysians have become accustomed to the fact that most clothing stores in Malaysia generally do not accept returned or exchanged goods through their "goods sold are not returnable or exchangeable policy" or even to expect the employees of the store to handle their complaints professionally (Ramayah & Jasmine, 2003). Therefore, Malaysians have come to accept this as some sort of a shopping norm which does not very much affect their intentions to continue visiting and purchasing in the stores. Nevertheless, it is still worthwhile for the retailers to apply prompt and professional problem-solving methods including having a proper system of returns and exchanges (Christo & Terblanche, 1997) as this can certainly delight the customers while positioning a favourable impression of the store in the customers' minds.

Being proven valid and reliable, the Retail Service Quality Scale presents many uses to both practitioners and academicians intending to examine retail service quality seriously at a deeper level. The instrument is useful in collecting data that can be used for benchmarking current levels of retail service quality as well as in carrying out periodic inspections to measure service performance and improvement. Using the instrument to analyse data at different levels (i.e. overall level and dimension level) allows the retailer to detect problematic areas of service quality within the stores that are in need of attention. With this, the retailer is able to focus its resources on improving the particularly weak aspects of its service.

The chosen clothing specialty stores in this study are renowned retailers whose consistent service and quality image have propelled them towards the success they are today. These two retailers have set certain standards in service quality that other clothing retailers can look up to or learn from. The findings from the analysis of data obtained from both stores confirmed the evaluation of service quality in a breakdown of the five crucial factors as posited by Dabholkar et al. (1996). For those retailers wishing to enhance their perceived service quality or even emulate the success of these two exemplary clothing stores, they need to ascertain that:

- *physical facilities* are clean, tidy, modern-looking and attractive complete with a convenient store

    layout that enables the customers to find what they need and to move around with ease.

- services are delivered *reliably* by fulfilling all promises made to customers, doing things right the first time without mistakes and having the merchandise available when the customers want it.
- their employees (salespeople) are courteous, helpful, knowledgeable with the ability to instill confidence in the customers at all times during their *personal interaction* with the customers.
- any complaints or *problems* faced by the customers are solved immediately, sincerely and professionally.
- their store *policy* is responsive to customer needs such as trading high quality merchandise, having convenient operating hours, ample parking spaces, a store discount or membership card and credit payment options.

Another crucial success factor for clothing retailers is maintaining low employee turnover. Despite being goods retailers in their very essence, clothing retailers still need to offer services that facilitate their sale of merchandise. This is achieved through their sales personnel who are responsible in assisting the customers in their shopping. Care should be taken to ensure that there are always adequate salespeople around in the store who have been thoroughly trained and are professional enough in their dealings with customers. Satisfying customer needs through excellent service quality provided by customer-oriented salespeople will increase the likelihood of customers returning to shop and eventually recommending the stores to others, thus allowing the retailer to compete effectively in the marketplace.

CONCLUSION

There's little doubt that the local fashion retail industry is evolving into an exceedingly competitive scene (The Star, 2004), with both foreign and local players fighting for a share in the customers' minds as well as hearts. In light of this, service quality has long been accepted as the most basic marketing tool for retailers to differentiate their retail offers, create competitive advantage and to enhance the customers' shopping experience (Christo & Terblanche, 1997; Siu & Cheung, 2001). Nevertheless, maintaining excellent service quality within the stores is no simple task as it requires continual measurement from time to time to monitor and identify areas of activity that may be responsible for the standards of service quality. This study has successfully validated Dabholkar et al.'s (1996) Retail Quality Service Scale in the Malaysian setting specifically in apparel specialty stores. In this respect, it is hoped that this scale can serve as a measurement tool which helps provide some imperative insights on the delivery of service quality in a contemporary global business environment.

REFERENCES

Arbuckle, J.L. & Wothke, W. (1995). *AMOS 4.0: user's guide*. United States of America: Smallwaters Corporation.
Babakus, E. & Boller, G.W. (1992). An empirical assessment of the SERVQUAL scale. *Journal of Business Research*, Vol. 24, 253-268.
Babakus, E. & Mangold, W.G. (1989). Adapting the SERVQUAL scale to hospital services: an empirical investigation. *Hospital Services Research*, Vol. 26, No. 6, 767-786.
Berry, L.L. (1986). Retail businesses are service businesses, *Journal of Retailing*, Vol. 62, No.1, Spring, 3-6.
Bouman, M. & Van der Wiele, T. (1992). Measuring service quality in the car service industry: building and testing an instrument. *Journal of Service Industry Management*, Vol. 3, No. 4, 4-16.
Brown, T.J., Churchill, G.A. & Peter, J.P. (1993). Improving the measurement of service quality. *Journal of Retailing*, Vol. 69, No. 1, Spring, 127-139.
Campbell, D.T. & Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, Vol. 56, No. 1, 81-105.
Carman, J.M. (1990). Consumer perceptions of service quality: an assessment of the SERVQUAL dimensions. *Journal of Retailing*, Vol. 66, No. 1, Spring, 33-55.
Chow, W.S. & Lui, K.H. (2001). Discriminating factors of information systems function performance in Hong Kong firms practising TQM. *International Journal of Operations and Production Management*, Vol. 21, No. 5/6, 749-771.
Christo, B. & Terblanche, N.S. (1997). Measuring retail service quality: a replication study. *South African Journal of Business Management*, Vol. 28, Issue 4, 123- 128.
Cronin, J.J. & Taylor, S.A. (1992). Measuring service quality: a reexamination and extension. *Journal of Marketing*, Vol. 56, July, 55-68.
Dabholkar, P.A., Thorpe, D.I. & Rentz, J.O. (1996). A measure of service quality for retail stores: scale development and validation. *Journal of the Academy of Marketing Science*, Vol. 24, No.1, 3-16.

Gagliano, K.B. & Hathcote, J. (1994). Customer expectations and perceptions of service quality in retail apparel specialty stores. *Journal of Services Marketing*, Vol. 8, No. 1, 60-69.

Hair, J.F., Anderson, R.E., Tatham, R.L. & Black, W.C. (1998). *Multivariate Data Analysis*. Fifth Edition. Upper Saddle River, New Jersey: Prentice-Hall.

Hummel, J.W. & Savitt, R. (1988). Integrated customer service and retail strategy. *International Journal of Retailing*, Vol. 3, No. 2, 5-21.

Kim, S. & Jin, B. (2002). Validating the retail service quality scale for US and Korean customers of discount stores: an exploratory study. *Journal of Services Marketing*, Vol. 16, No. 3, 223-237.

Kim, S. & Stoel, L. (2004). Dimensional hierarchy of retail website quality. *Information and Management*, Vol. 41, 619-633.

Lassar, W.M., Manolis, C. & Winsor, R.D. (2000). Service quality perspectives and satisfaction in private banking. *Journal of Services Marketing*, Vol. 14, No.3, 244-271.

Leung, C. & To, C.K. (2001). Measuring perceived service quality of fashion stores: a test-retest reliability investigation. *Journal of Fashion Marketing and Management*, Vol. 5, No. 4, 324-329.

Long, M. & McMellon, C. (2004). Exploring the determinants of retail service quality on the internet. *Journal of Services Marketing*, Vol. 18, No.1, 78-90.

Malhotra, N.K. (1993). *Marketing Research: An Applied Orientation*. Englewood Cliffs: Prentice-Hall.

Mehta, S.C., Lalwani, A.K. & Han, S.L. (2000). Service quality in retailing: relative efficiency of alternative measurement scales for different product-service environments. *International Journal of Retail & Distribution Management*, Vol. 28, No. 2, 62-72.

Nunnally, J.C. (1978). *Psychometric Theory*. Second Edition. New York: McGraw-Hill.

Pang, H.Y. (2004, May 10). BTC sees repeat success with 'Wh' label. *The Star*, p. 11.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1985). A conceptual model of service quality and its implication for future research. *Journal of Marketing*, Vol. 49, Fall, 41-50.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1988). SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, Vol. 64, No. 1, Spring, 12-40.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1991). Refinement and reassessment of the SERVQUAL scale. *Journal of Retailing*, Vol. 67, No. 4, Winter, 420-450.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1994). Alternative scales for measuring service quality: a comparative assessment based on psychometric and diagnostic criteria. *Journal of Retailing*, Vol. 70, No. 3, 201-230.

Ramayah, T., Jantan, M. & Tadisina, S.K. (2001). Job satisfaction: empirical evidence for alternatives to JDI. *32nd Annual Meeting of Decision Sciences Institute Conference*, Track OB2, San Francisco: USA.

Ramayah, T. & Jasmine, Y.A.L. (2003). What drives relationship quality? a study on two retail clothing stores. *The Proceedings of the 5th Asian Academy of Management Conference*, "Challenges of Globalized Business: The Asian Perspective", 10-13 September, Kuantan, Pahang, Malaysia.

Ramayah, T., Sulaiman, M., Lim, C.Y. & Jasmine, Y.A.L. (2004). SME e-readiness: is it unidimensional or multidimensional? *The Proceedings of the 3rd International Conference on Small and Medium Sized Enterprises in a Global Economy,* "Economic Resilience in East Asia – Role of SMEs and Stakeholders", 6–7 July 2004, Selangor, Malaysia.

Saraph, J.V., Benson, P.G. & Schroeder, R.G (1989). An instrument for measuring the critical factors of quality management.*Decision Sciences*, Vol. 20, 810-829.

Segars, A.H. & Grover, V. (1993). Re-examining perceived ease of use and usefulness: a confirmatory factor analysis. *MIS Quarterly*, Vol. 17, No. 4, 517-525.

Siu, N.Y.M. & Cheung, J.T. (2001). A measure of retail service quality. *Marketing Intelligence and Planning*, Vol. 19, No. 2, 88-96.

Sivadas, E. & Baker-Prewitt, J.L. (2000). An examination of the relationship between service quality, customer satisfaction and store loyalty. *International Journal of Retail and Distribution Management*, Vol. 28, No. 2, 73-82.

Trocchia, P.J. & Janda, S. (2003). How do consumers evaluate internet retail service quality? *Journal of Services Marketing*, Vol. 17, No.3, 243-253.

Zhu, F.X., Wymer, W. & Chen, I. (2002). IT-based services and service quality in consumer banking. *International Journal of Service Industry Management*, Vol. 13, No. 1, 69-90.

APPENDIX

Factor Structure and Item Listing for the Retail Service Quality Scale (Dabholkar et al., 1996)

Retail Service Quality Dimension	Perception Items
Physical aspects	P1. This store has modern-looking equipment and fixtures.
	P2. The physical facilities at this store are visually appealing.
	P3. Materials associated with this store's service (such as shopping bags, catalogs or statements) are visually appealing.
	P4. This store has clean, attractive and convenient public areas (restrooms, fitting rooms).
	P5. The store layout at this store makes it easy for customers to find what they need.
	P6. The store layout at this store makes it easy for customers to move around in the store.
Reliability	P7. When this store promises to do something by a certain time, it will do so.
	P8. This store provides its services at the time it promises to do so.
	P9. This store performs the service right the first time.
	P10. This store has merchandise available when the customers want it.
	P11. This store insists on error-free sales transactions and records.
Personal interaction	P12. Employees in this store have the knowledge to answer customers' questions.
	P13. The behaviour of employees in this store instill confidence in customers.
	P14. Customers feel safe in their transactions with this store.
	P15. Employees in this store give prompt service to customers.
	P16. Employees in this store tell the customers exactly when services will be performed.
	P17. Employees in this store are never too busy to respond to customers' requests.
	P18. This store gives customers individual attention.
	P19. Employees in this store are consistently courteous with customers.
	P20. Employees in this store treat customers courteously on the telephone.
Problem-solving	P21. This store willingly handles returns and exchanges.
	P22. When a customer has a problem, this store shows a sincere interest in solving it.
	P23. Employees of this store are able to handle customer complaints directly and immediately.
Policy	P24. This store offers high quality merchandise.
	P25. This store provides plenty of convenient parking for customers.
	P26. This store has operating hours convenient to all their customers.
	P27. This store accepts most major credit cards.
	P28. This store offers its own credit card.

Effect of Cost Increment Distribution Patterns on the Performance of JIT Supply Chain

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ABSTRACT

Cost is an important consideration in supply chain (SC) optimisation. This is due to emphasis placed on cost reduction in order to optimise profit. Some researchers use cost as one of their performance measures and others propose ways of accurately calculating cost. As product moves across SC, the product cost also increases. This paper studied the effect of cost increment distribution patterns on the performance of a JIT Supply Chain. In particular, it is necessary to know if inventory allocation across SC needs to be modified to accommodate different cost increment distribution patterns. It was found that funnel is still the best card distribution pattern for JIT-SC regardless the cost increment distribution patterns used.

INTRODUCTION

Similar to production floor, Supply Chain Management (SCM) places greater emphasised on profit optimisation. The usual way to optimise profit is by minimising total cost (Shapiro, 2001). Considering this, various researches in supply chain operation research integrate cost as one of their performance measures such as Gullu (1997), Sabri and Beamon (2000), Petrovic *et al.* (1998), Omar and Shaharoun (2000), Larsen *et al.* (1999) and Van Der Vost *et al.* (2000), while Lin *et al.* (2001) propose ways of accurately calculating cost by implementing activity-based costing (ABC) in managing logistics. Lin *et al.* (2001) suggested that the cost should be assigned to the resources for each logistics activities. Aggregating the cost into departments or sections will not represent true cost occurred at the corresponding sections. They claim that using ABC may provide accurate output of optimisation. Ingene and Parry (2000) reviewed the literature, which led them to conclude that product price is similar for each player at every echelon in a supply chain. Price discrimination is infeasible due to administrative, bargaining, and contract development costs.

As a product moves across a supply chain, the product cost also increases. However, most literature such those mention previously assumes equal cost per part at every echelon or in other words zero increment of cost. This hardly represents a real SC. There exist differences in cost increment per part at each echelon across a SC. For instance the cost might be incremented equally as we move downstream of the SC yielding a uniform cost increment distribution pattern or the increment might increases as we move downstream of the SC forming a funnel cost increment distribution pattern. How such increments of cost are distributed along a supply chain may affect the performance of JIT Supply Chain is still unknown. In particular, it is necessary to know if inventory allocation across a supply chain needs to be modified to accommodate different cost increments.

THE SUPPLY CHAIN

A SC studied by Closs *et al.* (1998) is selected as the hypothetical SC for this research. The supply chain was selected because it fulfilled all four requirement of basic SC structure and had extensive input and output data. Mohd Lair *et al.* (2003) present model selection and building in detail.

The SC selected consists of a supplier (S), a manufacturer (M), two distributors (D) and three retailers (R) as shown in Figure 1. There is unlimited supply of raw material at the supplier. Tables 1 through 3 provide additional information of the SC.

Figure 1: Supply Chain Layout (adapted from Closs *et al.* (1998)).
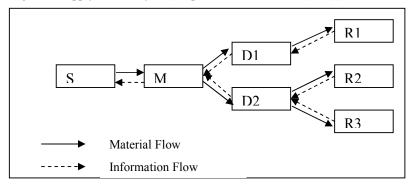
Table 1: Cycle Time (in days)

Parameter	Mean	Distribution
Processing time supplier	1.0	Normal (std dev. = 0.3)
Processing time manufacturer	0.08	Triangular(min=0.02, max=0.2)
Processing time distributor	0.3	Triangular (min = 0.1, max=1.0)
Processing time retailer	0.5	Triangular (min =0.2, max = 2.0
All transit times	5.0	(std dev. = 0)
Total Lead Time	21.9	

Table 2: Transportation Schedule and Truckload

Transporters	Schedule	Load
To Supplier	Once per week	
To Manufacturer	Once per week	Truck capacity 24 units Partial loads allowed
To Distributor	Twice per week	
To Retailer	Twice per week	

Table 3: Customer Arrival Pattern Distributions

Customer Arrival (Demand Pattern)	Distribution
Low Variability of Demand	Uniform (0.8,1.2)
High Variability of Demand	Uniform (0.2,1.8)

MODELLING AND EXPERIMENTATION

A model was developed using WITNESS® simulation software. Most input data was as given by Closs *et al.* (1998), and additional necessary data was set based on extensive preliminary experiments. The simulation models developed were then run. Output data were analysed. Validation was conducted by comparing the findings concluded from the simulation run with findings given by Closs *et al.* (1998). Detail discussions on model validation were presented in Mohd Lair *et al.* (2003).

The JIT-Hybrid model identified as the best JIT strategy in Mohd Lair *et al.* (2003) was used as the based for experimentation. Two parameters involved in this experiment were card distribution patterns and cost increment distribution patterns. The distribution patterns referred to bowl, inverted bowl, funnel, reversed funnel and uniform. Figure 2 illustrated the distribution patterns. Both cards and cost increment patterns were arranged according to the illustrated patterns.

In order to simplify study on four echelons SC, 20 cost objects with the smallest cost of 0.1 and total cost of 2.0 were selected. These values were selected as they can be distributed nicely among the four echelons. Andijani (1997) provided formulas to calculate the total number of feasible allocation sets for the cost;

$$A \; = \; C_{m-1}^{n-1} \quad = \frac{(n-1)!}{(m-1)!(n-m)!} \tag{1}$$

Where,

A = Feasible Allocation Sets.
n = Costs Objects
m = Number of Nodes

Using Formula 1, the feasible cost allocation sets for 4 echelons and 20 costs objects were:

$$A = \frac{(20-1)!}{(4-1)!(20-4)!}$$
$$= 969 \text{ sets}$$

The identified feasible cost allocation sets were then grouped into six groups; five groups each representing one of the five cost increment distribution patterns and a group of allocation sets that did not belong to any of the distribution patterns. Based on this, there was one allocation set for uniform, 63 sets for funnel and reversed funnel, 264 sets for bowl, and 236 sets for inverted bowl. The remaining 342 allocation sets were unidentified. The identified and grouped allocation sets represented the five cost increment distribution patterns.

The cost increment distribution patterns were then implemented on the models along with the corresponding card distribution patterns. The models were run and results were analysed. The section next discussed results in detail.
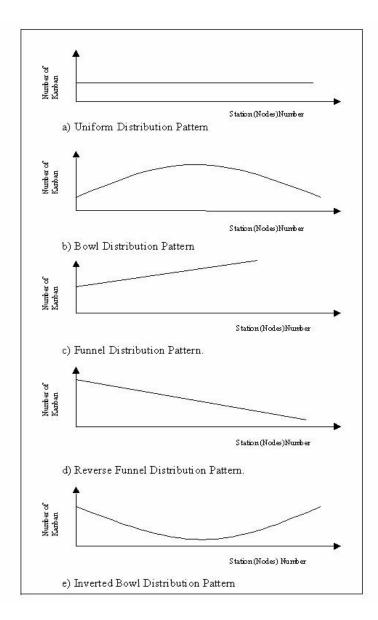
Figure 2: The Distribution Patterns

RESULTS

Table 4 presents the means and ANOVA results comparing each card distribution pattern under bowl cost increment distribution pattern. Based on the results presented, it is concluded that funnel card distribution pattern produced significant lowest inventory cost and bowl produced significant highest total inventory cost.

Table 4: Comparing the Means of Total System Inventory Cost for Bowl Cost Increment Distribution Pattern under Five Card Distribution Patterns.

Card Pattern	Mean (Std Dev.)	Total System Inventory Cost	
		Mean Diff. (Lowest) [a]	Mean Diff. (Highest) [b]
Bowl	126.73 (13.806)	-10.156*	-
Inverted Bowl	122.54 (14.182)	-5.972*	4.184*
Funnel	116.57 (13.105)	-	10.156*
Reversed Funnel	123.46 (13.591)	-6.886*	3.270*
Uniform	122.48 (13.688)	-5.906*	4.250*

- [a] Comparing the lowest mean (row)against other means. Tested using ANOVA.
- [d] Comparing the highest mean (row) against other means. Tested using ANOVA.
- * Indicates the mean difference is significant at $\alpha = 0.05$.
- ▢   Shaded indicates pattern (row) with either the lowest or highest mean.

Table 5 presents the means and ANOVA results comparing each card distribution pattern under inverted bowl cost increment distribution pattern. Based on the results presented, it is concluded that funnel, inverted bowl, reversed funnel and uniform card distribution patterns produced significant lowest inventory cost and bowl, inverted bowl, reversed funnel and uniform produced significant highest total inventory cost.

Table 5: Comparing the Means of Total System Inventory Cost for Inverted Bowl Cost Increment Distribution Pattern under Five Card Distribution Patterns

Card Pattern	Mean (Std Dev.)	Total System Inventory Cost	
		Mean Diff (Lowest) [a]	Mean Diff (Highest) [b]
Bowl	123.20 (21.494)	-7.458*	-
Inverted Bowl	120.37 (21.052)	-4.636	2.822
Funnel	115.74 (19.813)	-	7.458*
Reversed Funnel	120.56 (20.848)	-4.825	2.633
Uniform	120.09 (20.829)	-4.348	3.110

- [a] Comparing the lowest mean (row)against other means. Tested using ANOVA.
- [d] Comparing the highest mean (row) against other means. Tested using ANOVA.
- * Indicates the mean difference is significant at $\alpha = 0.05$.
- ▢   Shaded indicates pattern (row) with either the lowest or highest mean.

Table 6 presents the means and ANOVA results comparing each card distribution pattern under funnel cost increment distribution pattern. Based on the results presented, it is concluded that inverted bowl, funnel, reversed funnel and uniform card distribution patterns produced significant lowest inventory cost and bowl, inverted bowl, reversed funnel and uniform patterns produced significant highest total inventory cost.

Table 6: Comparing the Means of Total System Inventory Cost for Funnel Cost Increment Distribution Pattern under Five Card Distribution Patterns.

Card Pattern	Total System Inventory Cost		
	Mean (Std Dev.)	Mean Dif (Lowest)[a]	Mean Dif (Highest)[b]
Bowl	94.27 (12.04)	-5.997*	-
Inverted Bowl	91.58 (11.49)	-3.046	2.691
Funnel	88.27 (10.59)	-	5.997*
Reversed Funnel	92.32 (11.56)	-4.046	1.951
Uniform	91.70 (11.44)	-3.426	2.571

- [a] Comparing the lowest mean (row)against other means. Tested using ANOVA.
- [d] Comparing the highest mean (row) against other means. Tested using ANOVA.
- * Indicates the mean difference is significant at $\alpha = 0.05$
- ▢ Shaded indicates pattern (row) with either the lowest or highest mean.

Table 7 presents the means and ANOVA results comparing each card distribution pattern under reversed funnel cost increment distribution pattern. Based on the results presented, it is concluded that funnel card distribution pattern produced significant lowest inventory cost and bowl, inverted bowl, reversed funnel and uniform patterns produced significant highest total inventory cost.

Table 7: Comparing the Means of Total System Inventory Cost for Reversed Funnel Cost Increment Distribution Pattern under Five Card Distribution Patterns

Card Pattern	Total System Inventory Cost		
	Mean (Std Dev.)	Mean Dif (Lowest)[a]	Mean Diff (Highest)[b]
Bowl	154.38 (10.60)	-10.604*	-
Inverted Bowl	150.58 (10.60)	-6.802*	3.802
Funnel	143.78 (10.22)	-	10.604*
Reversed Funnel	150.67 (10.38)	-6.891*	3.713
Uniform	150.02 (10.47)	-6.235*	4.369

- [a] Comparing the lowest mean (row)against other means.
- [d] Comparing the highest mean (row) against other means.
- * Indicates the mean difference is significant at $\alpha = 0.05$
- Tested using ANOVA.
- ▢ Shaded indicates pattern (row) with either the lowest or highest mean.

Table 8 presents the means and ANOVA results comparing each card distribution pattern under uniform cost increment distribution pattern. Based on the results presented, it is concluded that funnel card distribution pattern produced significant lowest inventory cost and bowl produced significant highest total inventory cost.

Table 9 summarizes all discussion above. The table shows that funnel card distribution pattern is still the best when various cost increment distribution patterns are applied. Moreover, arranging the card in bowl distribution pattern may cause the total system inventory cost to be higher than necessary, as more inventories are needed to operate this system.

Table 8: Comparing the Means of Total System Inventory Cost for Uniform Cost Increment Distribution Pattern under Five Card Distribution Patterns

Card Pattern	Total System Inventory Cost		
	Mean (Std Dev.)	Mean Diff (Lowest) [a]	Mean Diff(Highest) [b]
Bowl	125.02 (1.03)	-8.821*	-
Inverted Bowl	121.52 (0.47)	-5.312*	3.509*
Funnel	116.20 (0.84)	-	8.821*
Reversed Funnel	122.07 (0.72)	-5.866*	2.954*
Uniform	121.34 (0.63)	-5.135*	3.686*

- [a] Comparing the lowest mean (row)against other means. Tested using ANOVA
- [d] Comparing the highest mean (row) against other means. Tested using ANOVA
- * Indicates the mean difference is significant at $\alpha = 0.05$
- ▢ Shaded indicates pattern (row) with either the lowest or highest mean.

Table 9: Card Distribution Patterns Representing the Lowest and Highest System Inventory Cost for each Cost Increment Distribution Pattern

Cost Increment Distribution Pattern	Card Distribution Pattern/s	
	Lowest Total Inventory Cost	Highest Total Inventory Cost
Bowl	Funnel	Bowl
Inverted Bowl	Inverted Bowl, Funnel, Reversed Funnel and Uniform	Bowl, Inverted Bowl, Reversed Funnel and Uniform
Funnel	Inverted Bowl, Funnel, Reversed Funnel and Uniform	Bowl, Inverted Bowl, Reversed Funnel and Uniform
Reversed Funnel	Funnel	Bowl, Inverted Bowl, Reversed Funnel and Uniform
Uniform	Funnel	Bowl

CONCLUSION

All previous studies on supply chain inventory management so far have used counts or units in inventory without regard to cost. For inventory cost minimization, this is tantamount to assuming that the costs of inventory remain constant across a supply chain. In reality, costs increase as the product moves along the supply chain. In this study, various patterns of incrementing cost were investigated. The results show that the selection of supply chain parameters for a supply chain is not sensitive to how the costs are incremented as the product moves along the supply chain. Specifically, it was found the funnel card distribution pattern is still the best i.e. it is still preferable to store inventory at the downstream nodes, even when the cost of inventories is much higher at these downstream nodes. Therefore, the current practice of using units of inventory as performance measure without regard to the cost increments along the supply chain is justified.

ACKNOWLEDGEMENTS

REFERENCES

Andijani, A. (1997). "Trade-off between maximizing throughput rate and minimizing system time in kanban system." *International Journal of Operations & Purchasing Management.* 17: 5; 429-445.

Closs, David J., Roath, Anthony S., Goldsby, Thomas J., Eckert, James A. and Swartz, Stephen M. (1998). "An Empirical Comparison of Anticipatory and Response Based Supply chain Strategies." *The International Journal of Logistics Management.* 9: 2; 21-33.

Gullu, Refik (1997). "A Two-Echelon Allocation Model and the Value of Information under Correlated Forecasts and Demands." *European Journal of Operation Research.* 99; 386-400.

Ingene, Charles A. and Parry, Mark E. (2000) "Is Channel Coordination All It Is Cracked Up To Be?" *Journal of Retailing.* 76:4; 511-547.

Larson, Paul D. and DeMarais, Robert A. (1999). "Psychic Stock: An Independent Variable Category of Inventory." *International Journal of Physical Distribution and Logistics Management.* 29:7/8; 495 – 507.

Lin, Binshan, Collins, James and Su, Robert K. (2001) "Supply Chain Costing: and Activity-based Perspective." *International Journal of Physical Distribution & Logistics Management.* 31:10; 702-713.

Mohd Lair, Noor Ajian, Nabi Baksh, Mohamed Shariff, Mohd. Shaharoun, Awaluddin (2003). "A Comparison of JIT with Conventional Inventory Strategies in a Supply Chain." *Proceedings of the 19thInternational Conference on CAD/CAM, Robotics and Factory of the Future.* July 22-24, Kuala Lumpur, Malaysia. 2; 779-785.

Omar, Mohamed K. and Shaharoun, Awaluddin M. (2000). "Coordination of Production and Distribution Planning in the Supply chain Management." *Proceedings of the Second International Conference on Advance Manufacturing Technology Johor Bahru, Malaysia: ICAMT -2000.* 545 –549.

Petrovic, Dobrila, Roy, Rajat and Petrovic, Radivoj (1998). "Modeling and Simulation of a Supply chain in an Uncertain Environment." *European Journal of Operational Research.* 109; 299-309.

Sabri, Ehap H. and Beamon, Benita M. (2000). "A Multi Objective Approach to Simultaneous Strategic and Operational Planning in Supply chain Design." *Omega.* 28; 581-598.

Shapiro, Jeremy F. (2001) *Modelling the Supply Chain.* Duxbury. Australia.

Van Der Vost, Jack G. A. J., Beulens, Adrie J.M., Van Beek, Paul. (2000). " Modelling and Simulating Multi-Echelon Food Systems." *European Journal of Operational Research.* 122; 354-366.

Organizational Commitment and
Job Satisfaction As Predictor of Job Performance

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ABSTRACT

This paper presents the findings of a study, which investigated how perception of organizational commitment and job satisfaction played a significant role in employees' job performance. A total of 584 staff from the managerial level in Telekom Malaysia (TM) were studied. The study used self administered questionnaire as the research instrument. The data obtained were then analyzed using correlation and regression analysis at .05 level of significance. The results hypothesized that both organizational commitment and job satisfaction (motivational and hygiene factors) perceptions are positively related to job performance. The study reported both motivational and hygiene factors and organizational commitment made significant contributions to employees' job performance. Among all the predictors, job satisfaction facet of working condition appeared to be the most significant predictor of job performance.

INTRODUCTION

Job performance, organizational commitment and job satisfaction have been attracted a great deal of interest in the current literature as evidenced by many writings and research carried out on this subject. In recent years, practicing managers in private and public sectors have begun similar interest in the subject as well. Literatures have documented that satisfied and committed employees will perform better that contribute towards organizational efficiency and effectiveness. Consequently, employees will be more likely to engage in extra role behaviors that could lead in reduction of withdrawal behaviors such as absenteeism, job performance and turnover (William and Anderson, 1996). In addition, the large interest in this topic appears to be a result of the link found between job attitudes particularly organizational commitment and job satisfaction with several significant employee behaviors such as turnover, intent to leave and job performance (Benkhoff, 1997). This is very much true especially among telecommunication organizations that are so dependent on the skilled employees, where the market is very tight.

LITERATURE REVIEW

JOB PERFORMANCE

Job performance has always been referred to as how successful a role achievement (behavior) is accomplished and this has long been emerged as a major concept in business schools of management (Benkhoff, 1997). Performance is the end result of the application effort. Porter and Lawler (1968) revealed that it was the aspect of an employee's behavior which organizations are most desirous of measuring and influencing. Mitchell (1986) expanded the definition of job performance as a combination of knowledge, skills and attitude of individuals in organization. According to Robbins (1996), to be a better performer four factors must be fulfilled by individual: know what is required to be done (role expectations), be motivated to do what is required, have the ability to do what is required and work in a conducive environment.

Job performance is related with individual performance and organizational performance (Cranny et al., 1992). Individual performance is a result of the aggregation of individual motives to achieve the relevant goals (Nathan, 1998). Nathan identified employees' commitment and satisfaction, effectiveness and efficiency as dimensions of organizational performance. Robbins (1996) suggests improvement in productivity as an important element in organizational performance. Therefore, according to Robbins organizational performance has to be integrated with individual capacity and organizational resources such as tool and materials.

Job performance can be measured in various ways. Among these are the use of ratings by supervisors, output measures and self-evaluation. The usual method of measuring performance in most studies has been to obtain

the supervisors rating on selected criteria such as quality and productivity (Porter & Lawler, 1968), or quality and quantity, output creativity and other criteria (Fletcher and Williams, 1996 and Benkhoff, 1997). Most organizations mainly industries and private organizations basically employed the definition as suggested by Fletcher and Williams (1996) and Benkhoff (1997). All of these kinds of measures have been used to assess the commitment and job satisfaction – performance relationship. Judge and Ferris (1993) for example, used supervisor's ratings to evaluate the overall job performance, quantity and quality of work and promotion readiness of employees. Such evaluations are most useful only in specific kinds of work settings.

Nevertheless, Judge and Ferris (1993) stated that neither supervisors' ratings nor output measures are scales that apply throughout the employees in organization. Alternatively, Darden et al., (1989) and Kalleberg (1993) suggest job performance measure based on the respondent's self-rating of quality and quantity of his or her performance in organization. A possible criticism of such evaluation is that some people are unable to report their performance accurately, due to reasons such as poor introspection. To avoid biasness in the evaluation of job performance Hind and Baruch (1997) used a combination of supervisor's ratings, self rating and self rating as compared to peers to evaluate the overall performance of quantity and quality of work, depth of knowledge, co-operation, loyalty, attendance, honesty, initiative, creativity, output and other criteria.

ORGANIZATIONAL COMMITMENT

Organizational commitment has been defined and measured in several different ways due to diverse definitions and measures in the scholarly literature. The various definitions and measures share a common theme in that organizational commitment is recognized to be a bond of the individual to the organization. Mowday et al (1982) and Cranny et al. (1992) generally agree that two views of organizational commitment dominate the literature: (1) behavioral approach and (2) attitudinal approach. The behavioral approach to commitment is concerned mainly with the process by which individuals develop a sense of attachment not to an organization but to their own action.

Allen & Meyer (1990) developed a measure of organizational commitment with three major components and corresponding scales: (1) The affective component of organizational commitment refers to employees' emotional attachment to, identification with and involvement in, the organization; (2) The continuance component refers to commitment based on the costs that employees associate with leaving the organization and (3) Normative commitment reflects an employee's feeling of obligation to remain with the organization, i.e. persons with a strong sense of normative commitment remain in organizations because they feel they ought to do so.

Mathieu and Zajac (1990) indicated that the most commonly studied type of organizational commitment has been attitudinal commitment. This approach sees commitment as an attitude reflecting the nature and quality of the linkage between an employee and an organization. Mowday et al. (1982) define commitment on both affective and continuance perspective which portrays a highly committed individual as one who has: (1) a strong belief in and acceptance of the organization's goals and values; (2) a willingness to exert considerable effort on behalf of the organization; and (c) a strong desire to maintain membership in the organization. Mowday et al (1982); Mathieu & Zajac (1990) and Allen & Meyer 1990) presented the view that commitment is a psychological state that (1) characterizes the individual's relationship with the organization and (2) has implications for the decision to continue or discontinue membership in organization. Building on these viewpoints, it is reasonable to hypothesize that there must be a significant relationship between organizational commitment and job performance.

JOB SATISFACTION

Job satisfaction is the extent to which an employee feels about his or her job (Odom et al., 1990). Demir (2002) refers job satisfaction to employees' feel of contentment and discontentment for a job. Cranny et al. (1992) concluded that job satisfaction is a contribution of cognitive and affective reactions to the differential perceptions of what an employee wants to receive compared with what he or she actually receives.

There are a number of job satisfaction theories in the organizational studies. These include hierarchy of need theory by Maslow (1970), three levels of need by Alderfer (1972), needs theory by Mc Clelland et al (1961), Mc Gregor (1960) theory X and Y and two factor theory by Hezberg (1973). Most of the job satisfaction studies

in US use Hezberg (1973) and Maslow (1970) theory as a basis for their research (Demir,2002). The popular theory that always been referred in organizational behavior studies is Hezberg's two factor theory (1973).

Hezberg's theory, based on two basis types of needs: 1) the need for psychological growth or motivating factors and 2) the need to avoid pain or hygiene factors. The motivating factors constitute elements like work itself, possibility for growth, responsibility, achievement, recognition for achievement and advancement. These are positive elements that contribute towards job satisfaction and motivation. Hygiene factors such as company or organizational policies and administration, quality of supervision, working condition, salary, relationship with peers and supervisors, status and job security are negative elements that could cause dissatisfaction at work.

In Hezberg's theory, job satisfaction and job dissatisfaction are totally separate dimension. Therefore, improving a hygiene factor such as working conditions will not make people satisfied with their needs, instead it will only preventing them from being dissatisfied. Generally, Hezberg's theory emphasizes the importance of individual in organization to advance. The advancement indirectly will change individual's needs. In consequential, it will help individuals to put extra effort to continuously achieve their needs and satisfaction and affect their behavior in organization. Based on this theory, the study attempted to investigate the relationship between Hezberg's job satisfaction theory and its contribution towards job performance.

JOB SATISFACTION, ORGANIZATIONAL COMMITMENT AND JOB PERFORMANCE

Previous literatures have revealed that organizational commitment and job satisfaction are related to job performance. This is because according to Mowday et al. (1982), committed and satisfied employees are likely to expend greater effort in the job. Therefore, it can be assumed that committed and satisfied employees perform better because they have higher levels of effort and motivation.

Steers (1997) hypothesized that job satisfaction is related to performance because satisfied employees are likely to exert extra efforts on the job. Similarly, Keisler (1991) argued that satisfaction motivates people or compel them to act. Therefore, it can be assumed that satisfied employees perform better because they have higher levels of effort and motivation (Katerberg and Blau, 1993). Staw (1984) stated that theories of work motivation are directly relevant to performance because highly motivated workers perform better for various reasons. According to Staw, people are thought to have greater needs for achievement that drive them toward success and they are assumed to be more goal oriented and be able to pursue certain ends that require successful performance. Lawler and Porter (1967) found that higher order needs of self-actualization and autonomy are related to high performance. Petty et al. (1984) also found positive relationship between job satisfaction components (using Job Description Index instrument) and job performance. Brayfield and Crockett's (1955) review revealed that satisfaction causes performance. Vroom's (1964) studies also found relationship between satisfaction and performance.

Studies also indicated that organizational commitment is related to job performance (Ayree and Tan, 1992; Meyer and Allen, 1991 and Rabinowitz and Hal, 1977). A meta analysis by Mathieu and Zajac (1990) indicates that affective commitment to organization is positively related to job performance. However Randal (1990) found non supportive results to this overall finding. The burgeoning evidence in commitment theory has also led to modification of the hypothesis that all forms of organizational commitment are positively related to job performance (Somers and Birnbaum, 1998). Due to continuance commitment reflects perceived sunk costs in organization rather than emotional links of affective commitment in the organization, Meyer et al. (1989) hypothesized that continuance to the organization is negatively related to job performance. In another study, Hackett et al. (1994) found a positive relationship between affective commitment to the organization and job performance.

Previous studies have indicated of the relationship between organizational commitment and job satisfaction with job performance. Moses's (1997) study of employees in electrical and electronic industries in Klang Valley indicated that organizational commitment and job satisfaction (in terms of extrinsic and extrinsic factors) are related to job performance and at the same time serve as a significant predictor of job performance. This finding is consistent with a study conducted among a representative of employed Americans by Katerberg and Blau (1993).

Based on the above literature, the present study seeks to test the following hypotheses:

HA$_1$: There is a positive and significant relationship between organizational commitment and job performance

HA$_2$: There is a significant and positive relationship between motivational Factors of job satisfaction and job performance

HA$_3$: There is a significant and positive relationship between hygiene factors of job satisfaction and job performance

RATIONAL AND CONTEXT OF THE STUDY

Organizational commitment and job satisfaction are viewed increasingly as a deep driver of motivational theories because changes in these attitudes are assumed to have implications for employee behaviors such as absenteeism, turnover and job performance (Jerry,1995).

Generally there is a consensus that satisfied and committed employees have a strong desire to remain with the employing organization (Mowday et al. 1982). Much of the research consisted of attempts to relate job satisfaction and organizational commitment with job performance (Moses, 1997 and Katerberg and Blau,1993). Previous findings were found to be inconclusive for example in terms of the strength of the relationship and the prediction equation. Therefore, cross-validational studies in which hypotheses are studied and replicated in different work setting are uncommon. As a result, there is a growing concern about the findings of external validity. Furthermore, a majority of the research treats job satisfaction and organizational commitment as a dependent variable. Very little is known about the behavioral outcomes of job satisfaction and organizational commitment, such as job performance, which is the focus of the study. In addition, there is a lack of study on the relationship between job satisfaction and organizational commitment with job performance among managerial employees in telecommunication sector, particularly in Telecom Malaysia. This study is of great importance for TM's employees to face with future challenges and in line with its vision to put the company as the communication company of choice-focused on delivering exceptional value to their customers and other stakeholders.

PURPOSE OF THE STUDY

The main purpose of this study was to empirically examine the relationship between organizational commitment and job satisfaction factors with job performance and the extent these variables can be the determinant or predictor of job performance among managerial employees in Telecom Malaysia

METHODOLOGY

SUBJECTS

The data for this study were collected from 584 employees of managerial level at Telecom Malaysia (TM). The study adopted stratified random sampling, which covered managers of TM in six regions mainly southern, eastern, western and northern part of Malay peninsular and Sabah and Sarawak. The background profiles of the subjects are presented in Table 1.

RESEARCH INSTRUMENTS

Data were collected by means of a closed questionnaire. The independent variables of this study are organizational commitment and job satisfaction. The Organizational Commitment Questionnaire (OCQ) developed by Mowday et al. (1982) which contains 15 items ranked from strongly disagree to strongly agree on the seven point Likert type scale was used to measure organizational commitment. The reliability coefficient of organizational commitment in this study was .90.

Table 1: Background Characteristics of the Respondents

	Mean	SD	n	%
Age	35.04	6.57	-	-
Experience in the organization	11.30	6.91	-	-
Total job experience	5.56	3.29	-	-
Male	-	-	374	64
Female	-	-	210	36
Married	-	-	392	67.1
Single	-	-	192	32.1

The questionnaire of job satisfaction comprised a combination of items adapted from Minnesota Satisfaction Questionnaire (MSQ) (Weiss et al., 1967) and Seegmiller's (1977). This instrument measures the various components or facets of Hezberg's job satisfaction theory mainly on motivational and hygiene factors. Motivational factors include: work itself, achievement, possibility for growth, responsibility, advancement and recognition for achievement. Hygiene factors are status, relationship with supervisor, relationship with peers, quality of supervision, policy and administration, job security, working condition and salary. For each of this component contains 5 items or statements. The response options for these items were 7 point Likert-scale ranging from strongly disagree to strongly agree. The reliability coefficient for job satisfaction factors scale was .91.

The dependent variable of the study is job performance. Job performance was measured based on adapted instrument developed by Hind and Baruch (1997) which measured job performance on evaluation from immediate (direct) manager or boss, self rating and self-rating as compared to peers. For each of this evaluation of job performance contains 3 statements or items for supervisor or boss rating, and one item each for self rating and self-rating as compared to peers. The response options for these items were 7 point Likert-scale, ranging from strongly disagree to strongly agree. The reliability for this scale was .92

RESULTS AND ANALYSIS

Correlational analyses were done to determine the extent of associations of organizational commitment, motivational and hygiene factors and job performance among employees in TM. Table 2 presents the zero-order correlations among the facets of the variables. All of the correlations were in the expected directions indicate low, moderate and high magnitude.

Consistent with expectations, there were significant and positive correlations among organizational commitment, motivational factors (work itself, achievement, possibility for growth, responsibility, advancement and recognition for achievement) and hygiene factors (status, relationship with supervisors, relationship with peers, quality of supervision, policy and administration, job security, working condition and salary) with job performance. These findings are consistent with past studies (Moses, 1997 and Katerberg and Blau, 1993). The results of the study tend to suggest that organizational commitment, all facets of motivational and hygiene factors were perceived as the stimulator for employees in TM to excel in their job performance.

THE EFFECT OF ORGANIZATIONAL COMMITMENT, MOTIVATIONAL AND HYGIENE FACTORS ON JOB PERFORMANCE (HA$_1$, HA$_2$ AND HA$_3$)

Multiple regression analyses using enter method were also performed in the present study to determine which of the independent variables predict the job performance of employees in TM. Results of the analyses are shown in Table 3.

Table 2: Intercorrelations among Dependent and Independent Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1															
2	*0.14														
3	*0.22	*0.66													
4	*0.23	*0.43	*0.21												
5	*0.14	*0.79	*0.24	*0.41											
6	*0.44	*0.49	*0.19	*0.13	*0.43										
7	*0.45	*0.82	*0.32	*0.61	*0.35	*0.59									
8	*0.52	*0.74	*0.26	*0.52	*0.45	*0.43	*0.63								
9	*0.41	*0.57	*0.18	*0.47	*0.33	*0.34	*0.47	*0.65							
10	*0.29	*0.23	*0.11	*0.24	*0.29	*0.12	*0.59	*0.48	*0.49						
11	*0.23	*0.42	*0.36	*0.27	*0.15	*0.36	*0.32	*0.36	*0.45	*0.27					
12	*0.31	*0.42	*0.16	*0.31	*0.14	*0.38	*0.49	*0.61	*0.61	*0.49	*0.49				
13	*0.46	*0.57	*0.21	*0.19	*0.56	*0.34	*0.84	*0.75	*0.77	*0.64	*0.67	*0.34			
14	*0.56	*0.68	*0.22	*0.48	*0.49	*0.41	*0.62	*0.85	*0.81	*0.77	*0.51	*0.37	*0.59		
15	*0.48	*0.65	*0.25	*0.44	*0.46	*0.45	*0.51	*0.81	*0.79	*0.65	*0.52	*0.43	*0.58	*0.79	
16	*0.28	*0.46	*0.75	*0.22	*0.11	*0.34	*0.60	*0.76	*0.70	*0.30	*0.54	*0.43	*0.61	*0.82	*0.65

p< .05

1. work itself   2. achievement 3. possibility for growth 4. responsibility 5. advancement 6. recognition 7. status 8. relationship with supervisor 9. relationship with peers 10. quality of supervision 11. policy and administration 12. job security 13. working condition 14. salary 15. organizational commitment. 16. job performance.

Table 3: Regression Results: Predicting Job Performance by Motivational and Hygiene Factors

Independent Variables	Beta	t	R^2	f	p
Organizational commitment	.39	10.29	.154	106.03	.000*
Motivational factors			.292	39.62	.000*
Work itself	.02	0.02			.695
Achievement	.05	0.05			.349
Possibility for growth	.01	0.04			.968
Responsibility	.25	5.73			.000*
Advancement	.28	5.86			.000*
Recognition for achievement	.40	6.03			.000*
Hygiene factors			.333	37.33	.000*
Status	.22	3.33			.001*
Relationship with supervisor	.14	2.37			.018*
Relationship with peers	.01	0.19			.851
Quality of supervision	.04	0.93			.353
Policy and administration	.08	1.94			.102
Job security	.01	0.09			.927
Working condition	.79	7.51			.000*
Salary	.33	3.48			.001*

* p < 0.05

Data in Table 3 showed that organizational commitment contributed 15 percent variance in job performance. The data also indicated that facets of motivational factors accounted for 29.2% of variance and hygiene factors accounted for 33.3% in job performance. Among the motivational factors responsibility, advancement and recognition for achievement turned out to be the significant predictors of job performance. While among the hygiene factors status, relationship with supervisor, working condition and salary emerged to be the significant predictors of job performance. The study revealed that hygiene factor of working condition was the most significant predictor to the job performance. Further, findings in this study emphasized the importance of organizational commitment, maintaining elements of job responsibility, career advancement, recognition for achievement, status, relationship with supervisor, conducive working environment and good salary within organization as prerequisite to maintaining and achieving employees' job performance.

DISCUSSION AND CONCLUSIONS

The study proposed to understand the relationship of organizational commitment, motivational and hygiene factors with job performance. Results of the bivariate analyses indicated that organizational commitment, facets of motivational and hygiene factors are significantly related to employees' job performance. The results were in the hypothesized direction as perceived that motivational, hygiene factors and organizational commitment contributed to employees' job performance. The results are in line with the findings reported by Moses (1997) and Katerberg and Blau (1993) who reported that both motivational and hygiene factors as well as organizational commitment affected employees' job performance. Therefore, the present study validates the results obtained by those researchers and generalized it to the other groups of employees.

IMPLICATION AND SUGGESTIONS

This study has contributed to the existing theory of organizational behavior and is useful for practical and theoretical purposes. The findings are very informative in explaining and solving some problems pertaining to behavioral aspects of organizations particularly related to factors that contribute towards job performance among managerial employees in TM. The study has given an in depth understanding on the relationship between several job satisfaction facets of Hezberg two factor theory and organizational commitment with job performance of the particular group of employees.

Results of this study suggest that management of TM should consider some factors that have been identified to be the predictors of job performance and incorporate them in any employees' development program to improve employee's performance in the workplace. Consideration on the factors, predictor and influence of job performance may help in reduction of behavioral issues among employees in the organization. Findings of this study will be of great help to provide understanding to management of TM in designing policies and strategies to improve their job performance.

Finally, this study serves as a departure for future studies of job performance. It furthers our understanding by determining and testing the factors that affect job performance. Finally, it is an initiative towards a greater understanding of organizational attitudes and behaviors particularly, job performance in the global business.

REFERENCES

Alderfer, C.P. (1972). Existence, relatedness and growth. New York: Free Press.

Allen, N.J. & Meyer, J.P. (1990). A cross-national perspective on managerial problems in an non western country. *The Journal of Social Psychology*, 136 (2), 165-172.

Ayree, S and Tan , K. (1992). Antecedents and outcomes of career commitment. *Journal of Vocational Behavior*, 40, 288-305.

Benkhoff, B. (1997). Ignoring commitment is costly. New approaches establish the missing link between commitment and performance. Human Relations, 506, 701-726.

Blumberg, M and Pringle, C.D (1982). The missing opportunity in organizational research: Some implications for a theory of work performance. Academy of Management Review, 7, 560-569.

Brayfield, A.H. and W. H. (1955). Employee attitudes and employee performance. *Psychological Bulletin*, 52, 396-424.

Cranny, C.J., Smith, R.C. & Stone, E.F. (1992). Job satisfaction: How people feel about their jobs and how it affects their performance. New York: Lexington.

Darden, W.R., Hampton, R and Howell, R. D. (1989). Career versus organizational commitment: antecedents and consequences of retail salespeople' commitment. Journal of Retailing, 65, 80-106.

Demir, M.C. (2002). Job satisfaction of nurses, working at Turkish Military Forces Hospitals. Military Medicine, 167, 402-404.

Fletcher, C. & Williams, R. (1996). Performance management, job satisfaction and organizational commitment. British Journal of Management, 7, 169179.

Hackett, R., Bycio,P. and hausdorf,P. (1994). Further assessments of Meyer and Allen's (1991) three component model of commitment. *Journal of Applied Psychology*, 79, 15-23.

Hezberg, F. (1973). Motivation: Management of success. Elkgrove Vi;;age, Illinois: Advanced System Inc.

Hind, P and Baruch, Y (1997). Gender variations in perceptions of job performance appraisal. Women in Management Review, 12 (6), 1-17

Jerry, R. (1995). An empirical investigation of the antecedents and consequences of job insecurity on the turnover intensions of academic accountants. Accounting Education, 10 (1), 65-70.

Judge,T.A. and Ferris, G.R. (1993). Social context of performance evaluation decisions. Academy of Management Review, 36, 80-105.

Katerberg, R. & Blau, G.J. (1993). An examination of level and direction of effort and job performance. Academy of Management Journal, 26,249-257.

Keisler, C.A (1991). The psychology of organizational sttitueds: Experiments linking behavior to belief. New York: Academic Press.

Kallerberg, A.L. (1993). Organizational commitment, job satisfaction and job performance: The meaning of work. Greenwich, CT: JAI Press.

Lawler, E.E. and Porter, L.W. (1967). The effects of performance on job satisfaction. *Industrial Relations*, 7, 20-28.

Maslow, A.H. (1970). Motivation and Personality. New York : McGraw Hill, Inc.

McClelland, D.C. (1961). Studies in motivation. New York: Appleton-Country-Crofts

McGregor, D (1960). The human side of the enterprise. New York:McGraw-Hill. Books Co., Inc.

Mathieu,.J. and Zajac, D. (1990). A review and meta analysis of the antecedents, correlates and consequences of organizational commitment. *Psychology Bulletin*, 108, 171-194.

Meyer, J. and Allen, N. (1991). A three conceptualization of organizational commitment. *Human Resource Management Review*, 1, 61-89.

Meyer, J., Paunonen, S., Gellatly, I., Goffin, R. and Jackson, D. (1989). Organizational commitment and job performance: it's the nature of commitment that counts. *Journal of Applied Psychology*, 74, 152-156.

Mitchell, T.R. (1986). Motivation: New direction for theory research and practice. England: Gower Publishing.

Moses, M.R.L. (1993). Organizational commitment and job performance among operators of selected electrical and electronic industries in Kalang Valley. Unpublished Phd dissertation : Universiti Putra Malaysia.

Mowday, R.T., Porter, L.W. & Steers, R.M. (1982). Employees organizational linkages: The psychology of commitment, absenteeism and turnover. New York: Academic Press.

Nathan, B. (1998). Does work group cohesiveness affect individuals' performance and organizational commitment?: A cross-level examination. Small Group Research, 29(4), 472-494

Odom, R.Y., Boxx, W.R. & Dunn, M.G. (1990). Organizational cultures, commitment, satisfaction and cohesion. Public Productivity & Management Review, 14, 157-168.

Porter, LW. & Lawler, E.E. (1968). Managerial attitudes and performance. Homewood, Illinois:Irwin

Randall, D.M. (1990). The consequences of organizational commitment: Methodological investigations. Journal of Organizational Behavior, 4, 361-378

Robbins, S.P. (1996). Organizational behavior.6th ed. Elglewood Cliffs, New Jersey: Prentice-Hall.

Seegmiller,J.P. (1977). Job satisfaction of faculty and staff at the College of Eastern Utah. Unpublished Phd dissertation: College of Eastern Utah.

Staw, B.M. (1984). Organizational behavior: A review and reformulation of the field's outcome variables. Annual Review of Psychology, 35, 627-666.

Steers, R.M. (1997). Organizational effectiveness: a behavioral view. Santa Monica: Goodyear Publishing Co.

Vroom, V.H. (1964). *Work and motivation*. New York: Wiley.

Weiss, D.J, David, G.W & Lofquist, L.H. (1967). Manual for the Mannesota Satisfaction Questionnaire. Work Adjustment, Industrial Relations Center: University of Minnesota.

William, L.J. & Anderson, S.E. (1996). Job satisfaction and organizational commitment as predictors of organizational citizenship and in role behaviors. Journal of Management, 17, 611-617.

An Empirical Study on the Suluk's Fishermen in Semporna, Sabah: Some Preliminary Evidence

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ABSTRACT

This preliminary empirical study try to identify the socioeconomic profile of the Suluk's fishermen in the district of Semporna, Sabah focusing particularly on their income, expenditure and saving patterns. A total of 100 questionnaire distributed randomly and only 69 can be used for analysis purposes. Apart from questionnaire, informal interviews were also conducted to obtain further information concerning the core issues under study. Based on the conventional framework of macroeconomic analysis on the relationship between income and saving, this study found that there exist zero-saving phenomenon among most of the respondents who were living below the state's poverty line income. Though such phenomena has not been proven rigourously and subject to be inconclusive for the time being, yet it has shed a light and keen motivation to conduct further investigation on such phenomena.

INTRODUCTION

The Suluks (also known as *Suk* or *Taosug*) came originally from Jolo and Siasi Islands in the northern Sulu archipelago (Piper, 1981), and are distinguished from the Bajau and Bajau Laut by language and culture. They are established traders and businessmen and act as middlemen for the Bajau Laut, trading with them and exchanging food and various goods for marine products. Most of the elderly Suluks in Semporna have been involved in fishing activities for an average of 15-25 years. Though such activity is done on a small scale they remain knowledgeable about fishing grounds, type of baits to be used and how to make fishing tools (Suliansa, 2000). Fishing activities in the Semporna Islands is undertaken by both permanent and temporary island inhabitants, as well as by fishermen from other islands and from the mainland. Traditional methods of catching fish include hook-and-line (the most common technique), spears and various types of traps and nets. Commercial fishing techniques include trawl nets, purse seine nets and gill nets.

For this preliminary study, we are focusing on the socioeconomic profile of the Suluk's fishermen particularly concerning their savings pattern based on their responds towards questionnaire and interviews carried out in this study. Based on past literatures, research on this particular area can be considered 'very few' as compared relatively

to studies carried out in other part of the country. For example, empirical studies by Raymond (1966), Yap C.L. (1976;77), Chee & Munro (1978), Wan Hashim (1980;1982), Jahara Yahaya (1984) and Nik Hashim Mustapha (1984) covered mostly those resided in Peninsular Malaysia. Since most previous studies are not specifically done on one particularly ethnic in Sabah, this paper is an attempt to provide a preliminary insight and enlightenment for further research in the near future. This paper is structured as follows. Section II discusses past studies concerning socioeconomics profile among fishermen in various areas in Sabah. Section III explained the underlying methodology used in conducting this study. Section IV explains some of the preliminary findings of the study. Finally, in section V, we discuss on the implications of the preliminary study.

PAST STUDIES OF FISHERMEN IN SABAH

Majority of previous surveys regarding fishery communities in Sabah were done extensively by KO-NELAYAN (1982; 1984$_a$; 1984$_b$; 1985; 1986$_a$ & 1986$_b$), especially in the West Coast of Sabah, the research by state's Socio-economic Research Unit known as SERU (1981) and by keen individuals like Lydia, Tertia & Marleen (1988) and Mary & Chang (1994).

Most of the research found out that the average income among fishermen in those areas were between RM100-600 per month. A socioeconomic research done by SERU (1981) among fishermen in Kudat, Sabah indicated that majority of them aged between 41-50 years old. Approximately 80-90% out of 271 respondents do not have any formal education and spent at least 20 years of their lives as fishermen. Their average income was between RM 300-400 a month and only 18.5% of them saved some portion of their income. A study done by KO-Nelayan in 1984 among fishermen in Beaufort, Sabah. Out of 669 respondents, 95.5% fell under the RM100-500 income bracket. Following a similar study also done by KO-Nelayan in the same year that involved fishermen in the district Kuala Penyu, Sabah indicated a more or less similar findings. Out of 278 fishermen interviewed, 69.6% was found, in average, to earned between RM100-300 per month. Suliansa (2000) estimated the average incomes/month for different types of fishing activity as follows: live fish RM 400-800; fresh fish RM 200-700; dried fish RM 150-400; sea cucumbers RM 200-500. An average for all these types of fishing could be in the region of RM 400/month, giving an annual average income of RM 4,800. Komilus, et.al (1999) reported that there are 201 registered fishermen from the Semporna Islands, which would give a total annual value of RM 964,800 based on market prices for these marine resources.

METHODOLOGY

The fieldwork of this study were conducted in July-Oct 2003 which involved a total of 100 head of household among those who resided in three fishing villages in Semporna, Sabah, i.e., Kampung Selamat, Kampung Simunul and Kampung Batu. These respondents were chosen randomly to respond to the constructed questionnaire in order to capture their socioeconomics profile and characteristics. Unfortunately, only 69 questionnaires can be used for data analysis purposes. The rest of the targeted respondents did not responded accordingly and were less cooperative. To tackle with such shortcoming, we have also conducted informal interviews with some elderly fishermen in their homes to gather extra data and information for this study. We are using SPSS version 12.0 to analyse the collected data.

PRELIMINARY FINDINGS

Background Of The Respondents

All the respondents are and a total of 60.8% of the them aged between 31-50 years old and are actively involved fishing activities and only 11.6% aged below 20. Most of the respondents were married (91.3%), bachelor (5.8%) and divorced (2.8%). Highest and lowest level of education is secondary school and no formal education respectively. A total of 27.5% and 53.6% of the respondents have no formal education and at least obtained primary education respectively. This had probably hindered them from obtaining formal jobs in the labour market. Moreover, based on most of the interviews with the respondents revealed that fishing is an inherited job among them. For further details on the background of these respondents, see Table 1, 2 and 3.

Table 1: Suluk's Fishermen In Semporna: Age Category

Age Category (Years)	Frequency	Percentage
< 20	8	11.6
21 – 30	18	26.1
31 – 40	24	34.8
41 – 50	11	15.9
51 – 60	7	10.1
> 61	1	1.4
Total	69	100.0

Table 2: Suluk's Fishermen In Semporna: Marital Status

Status	Frequency	Percentage
Married	63	91.3
Bachelor	4	5.8
Divorced	2	2.8
Total	69	100.0

Table 3: Suluk's Fishermen In Semporna: Level Of Education

Level	Frequency	Percentage
No Formal Education	19	27.5
Primary School	37	53.6
Secondary School	13	18.8
Total	69	100.0

Income, Saving And Expenditure Pattern

As indicated in Table 4, it was found out that 63.8% of the fishermen under study earned no more than RM 600 per month and this is below than the state's Poverty Line Income (PLI) of RM690[1]. This implied that most of the respondents are living under poverty level based on the current PLI stipulated under the MTR8MP. In relation to this, if we study the household expenditure pattern among these fishermen, it was found out that 23.2%, 15.9% and 17.4% of the respondents spent around RM 201-300, RM 301- 400 and RM 401-500 per month respectively. See Table 5.

Table 4: Suluk's Fishermen In Semporna Total Monthly Income (RM)

Monthly Income	Frequency	Percentage
< 100	3	4.3
101 – 200	7	10.1
201 – 300	12	17.4
301 – 400	8	11.6
401 – 500	9	13.0
501 – 600	5	7.2
601 – 700	3	4.3
> 701	22	31.9
Total	69	100.0

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[1] Based on the Mid-Term Review of the Eight Malaysia Plan 2001-2005 (MTR8MP), Poverty Line Income for the state of Sabah is RM 690, Sarawak RM 600 and Peninsular Malaysia RM 590.

Surprisingly, 49.3% of these respondents did not saved any portion of their monthly income as indicated in Table 6. Why is this so? When we examined the total cash balance i.e., difference between monthly income and expenditure, it was found out that 26.1% of the respondents faced with negative balance while 26.1% fell in the zero-balance category. See Table 7 for further details. Based on this analysis, it is seemed plausible to assume the factors that could explain the zero-saving phenomena among them is due to their negative cash balance or zero-balance. This might be a premature conjecture and could be subjected to inconclusiveness, yet further analysis on this matter is beyond the scope and context of this preliminary study.

Table 5: Suluk's Fishermen In Semporna: Total Monthly Expenditure (RM)

Monthly Expenditure (RM)	Frequency	Percentage
< 100	3	4.3
101 – 200	8	11.6
201 – 300	16	23.2
301 – 400	11	15.9
401 – 500	12	17.4
501 – 600	6	8.7
601 – 700	4	5.8
> 701	9	13.0
Total	69	100.0

Table 6: Suluk's Fishermen In Semporna: Total Monthly Savings (RM)

Monthly Savings (RM)	Frequency	Percentage
< 100	21	30.4
101 – 200	4	5.8
201 – 300	2	2.9
301 – 400	1	1.4
401 – 500	7	10.1
None	34	49.3
Total	69	100.0

Table 7: Suluk's Fishermen In Semporna: Cash Balance (Rm)

Cash Balance[*] (RM)	Frequency	Percentage
Negative	18	26.1
Rm 0	18	26.1
Rm 1 – 100	12	17.4
Rm 101 – 200	8	11.6
Rm 201 – 300	4	5.8
Rm 301 – 400	2	2.9
Rm 401 – 500	5	7.2
> Rm 501	2	2.9
Total	69	100.0

Note: [*] Income minus expenditure

Table 8: Suluk's Fishermen In Semporna: Reasons To Save Proportion Of Income

Future and Current Consumption

Reason to save	Percentage			
	Strongly Disagree	Disagree	Agree	Strongly Agree
Preparation for wedding reception	48.5	18.2	18.2	15.2
Preparation for later stage in life	3	6.1	54.5	36.4
To perform Haj	12.1	6.1	42.4	39.4
For emergencies like death, accident, etcs	-	6.1	45.5	48.5
To open small business	6.1	9.1	57.6	27.3
To pay children school fees and expenses	6.1	6.1	42.4	45.5
Preparation for festive seasons	-	9.1	54.5	36.4

Buying Durable Goods

Reason to Save	Percentage			
	Strongly Disagree	Disagree	Agree	Strongly Agree
To buy durable goods i.e., car, boat etcs.	3	24.2	42.4	30.3
To buy a dream house	9	15.2	45.5	30.3

Bank and Government Policies & Others

Reason to Save	Percentage			
	Strongly Disagree	Disagree	Agree	Strongly Agree
To take advantage of saving schemes initiated by government	15.2	18.2	42.4	24.2
To Take advantage of interests rates offered by banks	21.2	12.1	48.5	18.2
To kick of spendthrift habit	6.1	12.1	51.5	30.3
An incremental in income received	3	3	48.5	45.5

As also shown in Table 6, out of 69 respondents, 35 (50.7%) have allocated some proportion of their income for saving purposes and were motivated by several factors. Table 8 summarizes the reasons of what motivated them to save their income earned from fishing activities. Each reason is clustered into three main categories, i.e., for current and future consumption, for buying durable goods and due to bank and government policies & others. What and which factors deserved consideration? The appropriate tool to address this matter is through factor analysis with the aim to find the latent variables or factors among observed variables. In other words, factor analysis grouped variables with similar characteristics together to produce a small number of factors from a large number of variables that is capable of explaining the observed variance in the larger number of variables. There are several methods for factor extractions, namely, principal components, unweighted least squares, generalized least squares, maximum likelihood, principal axis factoring, Alpha factoring and image factoring. The most frequently used are principal components (PC) and principal axis factoring (PAF) and there are a number of assumptions and practical considerations underlying the application of PC and PAF (Coakes & Steed, 2003)[3].

We have suspected that this preliminary study is plagued with inadequacy number of observations, therefore it is plausible to expect that most, if not all, of the output produced will be statistically insignificant. Using SPSS 12.0, summaries of the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is shown in Table 8. Although the Bartlett's test is statistically significant but the KMO measure of adequacy is less than 0.6 which mean that it is rather reasonable not to proceed with further analysis.

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[3] For further reference on this topic see Mardia, Kent & Bibby (1979); Chatfield & Collins (1980); Sharma (1996); Johnson (1996); Stevens (2002); Hair, et.al. (1998) and Johnson & Wichern (2002).

Table 9: Suluk's Fishermen In Semporna: Kmo & Bartlett's Test

KMO Measure of Sampling Adequacy		0.587
Bartlett's Test of Sphericity	Approx. Chi-Square	209.361
	Degree of freedom	78
	Significance	0.000

Source: SPSS 12.0 output using collected data in the study

IMPLICATIONS OF THE PRELIMINARY STUDY: SOME POINTS FOR CONSIDERATIONS

Undeniably, this preliminary study is plagued with deficiencies. This is especially true on matters regarding limited analysis that can be carried out using the data and information captured in the study. Yet it has spurred some valuable and interesting initial insights on the socio-economics profile of that particular ethnic in the state. As mentioned earlier, there were very few studies done on such community in this part of the world. We believe it is about time that more focus and attention should be given on studying the underprivileged and marginalized community in order to materialized the concept of people-centered development as stipulated in the Human Development Report 2003.

Based on the preliminary findings of the study, it was found out that most of the respondents were living below the state's PLI and their savings were limited by the income earned by them through fishery activities. What went wrong? Was it caused by inadequacy of technical equipment or financial support that hinders their potential effort for better outcomes? Are the ongoing and past policies were less effective in the betterment of these folks? Does educational attainment affected their ability to enhance their standard of living? All these are some of the unchecked and unexplored matters that deserved to be addressed and considered accordingly.

REFERENCES

Chatfield, C. & Collins, A. J., 1980. *Introduction to Multivariate Analysis*. London: Chapman and Hall.

Chee, K.L. & Munro, G.R., 1978. *The Economics of Fishing and the Developing World: A Malaysian Case Study*, Penang, Penerbitan Universiti Sains Malaysia.

Coakes, S.J. & Steed, L.G., 2003. *SPSS: Analysis without Anguish*, John Wiley & Sons Australia Ltd.

Hair, J.F. Jr., Anderson, R.E., Tatham, R.L., & Black, W.C., 1998. *Multivariate Data Analysis*, 5th Edition. Upper Saddle River, NJ: Prentice Hall.

Human Development Report 2003, Millennium Development Goals: A compact Among Nations to End Human Poverty. United Nations Development Programme (UNDP) New York Oxford Oxford University Press.

Jahara Yahaya, 1984. *An Economic Study of Fisheries Production – With Particular Emphasis on Location-Specific Trawl Fishing in Terengganu, Peninsular Malaysia*, Ph.D. thesis, Universiti Malaya.

Johnson, D.E., 1998. Applied *Multivariate Methods for Data Analysis*. Pacific Grove, CA: Brooks/Cole Publishing.

Johnson, R.A. & Wichern, D.W., 2002. *Applied Multivariate Statistical Analyses*, 5th Edition. Upper Saddle River, NJ: Prentice Hall.

KO-NELAYAN, 1982. *Sabah Fishermen and Their Economy – A Socio-economic Survey*, Kota Kinabalu.

KO-NELAYAN, 1984a. *A Report on the Socio-economic Survey of Fishermen at Weston, Beaufort, Kota Kinabalu.*

KO-NELAYAN, 1984b. *A Report on the Socio-economic Survey of Fishermen at Sipitang, Kota Kinabalu*.

KO-NELAYAN, 1985. A Report on the Socio-economic Survey of Fishermen at KO-NELAYAN's Numbak Settlement Scheme, Kota Kinabalu.

KO-NELAYAN, 1986a. A Report on the Socio-economic Survey of Fishermen at Menumbok, Kota Kinabalu.

KO-NELAYAN, 1986b. A Report on the Socio-economic Survey of Fishermen at Kuala Penyu, Kota Kinabalu.

Komilus, C.F., T. Hassan, W.C. Shing, I. Isnain, B. Martin, D. Laision, G. Gueh, R. Biusing & B. Jintony, 1999. *The Semporna Islands Project: The Marine Fisheries Industry. A report for the Semporna Islands Project*. Fisheries Research Centre, Sabah.

Lydia, B., Tertia, J., & Marleen, N., 1988. *The Brunei Bay Fishermen of Sabah, Malaysia – A Socio-economic Study in 3 Selected Communities*, Kota Kinabalu.

Malaysia, Government of, *Mid-Term Review of the Eighth Malaysia Plan 2001-2005*, Economic Planning Unit, Department of Prime Minister, Kuala Lumpur.

Mardia, K.V., Kent, J.T., & Bibby, J.M., 1979. *Multivariate Analysis*. New York: Academic Press.

Mary, S. & Chang, S.K., 1994. Profil Sosio-Ekonomi Isirumah Nelayan Di Sabah in *Komuniti Nelayan: Cabaran, Harapan dan Masa Depan,* edt. Mohd. Yaakub Haji Johari, Chang Shui Kiong & Mary Sintoh, Yayasan Konrad Adenaur, Institut Kajian Pembangunan Sabah, Kota Kinabalu.

Nik Hashim Mustapha, 1984. *Economic Analysis of Management Alternatives for Malaysian Fisheries*, Ph.D. thesis, Washington State University.

Piper, M. 1981. Report on human settlements. WWF *Survey Expedition to Semporna 1980*. Sabah Museum.

Raymond, F., 1966. Malay *Fishermen: Their Peasant Economy*, 2nd edition, London: Routledge and Kegan Paul.

SERU, 1981. Draft *Socio-economic Status of Fishermen in the District of Kudat, Sabah*, Prime Minister Department, Sabah

Sharma, S., 1996. *Applied Multivariate Techniques*. United States: John Wiley & Sons.

Stevens, J., 2002. *Applied Multivariate Statistics for the Social Sciences* 4th Edition. Mahwah, NJ: Lawrence Erlbaum Associates.

Suliansa, M.S. 2000. Survey on the use of marine resources at the Semporna Islands. *A report for the Semporna Islands Project*. WWF Malaysia.

Wan Hashim, 1980. *Komuniti Nelayan di Pulau Pangkor*, Kuala Lumpur, Dewan Bahasa dan Pustaka.

Wan Hashim, 1982. *The Transformation of Malay Peasantry Under Peripheral Capitalism*, Ph.D. thesis, University of Manchaster.

Yap, C. L., 1976. Fisheries Policies and Development With Special Reference to the West Coast of Peninsular Malaysia From Early 1900s, *Kajian Ekonomi Malaysia*, 13, 1-2.

Yap, C. L., 1977. Poverty in the Fishing Industry: An Analysis of the Profit Sharing System in the Dindings, in B.A.R Mokhzani and Khoo Siew Mun (ed), *Some Case Studies on Poverty in Malaysia*, Kuala Lumpur, Persatuan Ekonomi Malaysia.

The Influence of Creative Organizational Climate on Learning Organization Among Employees in Private Organization

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ABSTRACT

This paper examined the relationship between creative organizational climate dimensions with learning organization. Consequently this study examined the influence of creative organizational climate dimensions on learning organizational. The sample consisted of 200 lower and higher level employees from the selected telecommunication firms. The study used self administered questionnaire of CCQ (Creative Climate Questionnaire) and DLOQ (Dimensions of Learning Organization Questionnaire). The data were analyzed using descriptive and inferential statistics at .05 level of significance. The results revealed that all of the creative organization climate dimensions are related to learning organization. The study also reported that all dimensions of creative organizational climate were able to influence learning organization significantly at .05. Among all the dimensions, liveliness/dynamism appeared to be the most significant influence of learning organization. Based on the implications of the research findings, several recommendations were put forward.

INTRODUCTION

The economic crisis in 1997 has changed rapidly the environment and management concepts in most private organization (Abidin,1999). One of the greatest changes was the concept of work that changed from life long employment to life long career. This paradigm focuses more on the responsibility of individual employee. After few years of organizational restructuring and work reengineering, private firms and companies in Malaysia are now regaining their competitiveness in the global economy (Cecilia, 1999). Therefore, in search for greater efficiency and high performance, many telecommunication companies continue to redesign and automate process and operation, resulting in a reduction of employees. Despite many workers being unemployed due to restructuring processes, management still recruit and retain qualified and knowledgeable people (Cecilia, 1999)**.** Management realizes that a productive workforce will provide a global, sustainable and competitive advantage for business organization.

Generally, in the past relationship of employee and employer was primarily based on loyalty, but now is based on performance and benefit. The change of composition in the workforce has caused company that offer better benefits and supportive working environment to gain leverage in hiring and retaining valuable, competent and knowledgeable people (Park, 2001). Pressure is mounting on all types of organizations to learn faster and to manage their knowledge better (Loermans, 2002). Park (2001) stated that business organizations are paying increasing attention to increased organizational positive attitudes and creating learning organization.

In an attempt to reap the purported benefits that knowledge workers bring to organization some companies have shifted to a customer problem-oriented policy. In keeping with much of the contemporary literature on the learning organization, these companies hope to deter their customers through the knowledge benefits that derive from associated technologies. This is because many private and public organizations are striving to change their operations towards concept of knowledge worker through learning organization (Brown and Brudney, 2003). This interest stems from the premise that success in changing environment and competitive advantage requires learning – recognizing a need for change, evaluating new possibilities and implementing new courses of action (Edmondson, 2002).

The concept of learning organization is increasingly relevant to management because of the increasing complexity, uncertainty and rapidity of change of the environment (Malhotra, 1996). It is therefore important to understand what a learning organization is, what is its characteristic and how creative organizational climate relates to learning organization. This paper highlights the nature of the relationship and influence of creative organizational climate on learning organization.

LEARNING ORGANIZATION

For the past few decades, considerable interest has been devoted to the concept of learning organization (Argyris and Schon 1978, Levitt and March 1988, Stata 1989, Senge 1990, Huber 1991, Schein 1993 and Garvin 1993). According to Geus (1988), the large interest in this topic appears to be a result of the link found between learning organization and the success in changing environment and the ability of a workforce in an organization to learn faster than those in other organizations constitutes the only sustainable competitive advantage at the disposal of a learning organization. This is because a learning organization evolves as a result of the learning and behavior of its people (Burgoyne and Pedler, 1994). According to Sandelands (1999) and Amidon (1996), companies that are not able to embrace learning and knowledge generation at the organizational level simply disappear.

Confessore and Kops (1998) described learning organization as an environment in which organization learning is structured in order to allow teamwork, collaboration, creativity and processed knowledge have a collective meaning and value. Marquardt (2002) stressed that in a learning organization, the corporate culture is one in which learning is recognized as absolutely critical for business success. Accordingly, learning can occur at three levels: individual, team or group and organizational. Therefore, the role of learning organization is to develop the capacity to encourage and maximize all the three levels.

In contrast, Senge (1990) suggested learning organization as one that should be viewed holistically, that is all individuals within the organization work together across traditional boundaries to solve problems and to create innovative solution. Senge (1990) recommended a systems view of the learning organization to explain: (1) system thinking, (2) personal mastery, (3) mental models, (4) a shared vision and (5) team building. Further, Senge (1990) emphasized that a learning organization has to be continually expanding its adaptive and generative learning capacity to create its future. From this scenario, according to Rosow and Zager (1988), employees in the organization have a major task of knowledge and skill acquisition as a part of their job and responsibility. Therefore the main goal of learning organization is to ensure employees to be able to understand and apply these disciplines to increase their level of knowledge and, as result, to achieve organization's success.

As a means to enhance the organization's capacity to adapt to environmental forces, Watkins and Marsick (1993) identified learning organization based on seven dimensions: (1) creating continuous learning opportunities, (2) promoting inquiry and dialogue, (3) encouraging collaboration and team learning, (4) establishing systems to capture and share learning, (5) empowering people to have a collective vision (6) connecting the organization to the environment and (7) providing strategic leadership for learning. Therefore, individual learning is a means to enhance the organization's capacity to adapt with environmental forces (Watkins et al., 1997). Watkins and Marsick's (1993) framework of learning organization highlighted that building a learning organization is a process in which individual intellect is harnessed to create a collective understanding of the environment, the roles and purposes of business.

A learning organization is also viewed as an organization skilled at creativity, acquiring and transferring knowledge and at modifying its behavior to reflect new knowledge and insights (Garvin, 1993). Watkins and Marsick (1997) emphasized that learning organizations are responsive to the external and internal environment and can be described as learning continuously and transforming itself. Watkins and Marsick's (1993) framework of learning organization was tested and validated in most countries. This framework has also been widely used by researchers. Due to its strong validity over time and across borders, Watkins and Marsick's (1993) instrument was selected to measure learning organization in this study.

FACTORS AFFECTING LEARNING ORGANIZATION

Organization needs to provide activities for employees as well as providing an environment and climate or condition that facilitates or inhibits learning (Knowles, 1984). Merriam and Caffarella (1991) suggested three main factors that influence learning in an organization: (1) people who can influence the learning process, including trainers and supportive middle and top management, (2) mission and operating procedures to guide policy and (3) the culture or shared values that frame organizational actions. Nonaka and Takeuchi (1995), suggested a key characteristic of the learning organization is the ability of its members to make opportunities to learn from whatever resources or situation is available and to add value to the organization by converting individual information into organizational knowledge.

As a learning organization that facilitates the learning of all its members, Pedler et al. (1991) identified factors and characteristics of a learning organization encompassing: (1) opportunities for organizational members to

experiment in developing corporate strategy, ((2) participation in policy making, in which sharing and the involvement of all members are encouraged (3) the open exchange of information that promotes internal dialogues and collects external data, (4) a flexible structure that encourages growth and experimentation, creative problem solving and flexibility and (5) opportunities and resources for self-development such that individuals are encouraged to take responsibility for their own learning and development. Individual's role is inherent in the learning organization and therefore the individual's capacity to learn is a key component of this capability (Padler et al., 1991).

In addition, Marquardt (2002) contended that learning organization should be related to five subsystems mainly: learning, organization, people, knowledge and technology. Marquardat (2002) emphasized that all five are important to sustain viable, ongoing organization learning and ensuring corporate success. According to Garratt (1999), although the concept of learning organization did not emerge until 1980's, but its principles are rooted into many perspectives of management and its practices recognize a wide range of factors, such as organization strategy, climate for creativity, organizational climate, culture, structure, absorptive capacity, problem solving ability, and employee participation.

CREATIVE ORGANIZATIONAL CLIMATE AND LEARNING ORGANIZATION

Organizational climate particularly creative organizational climate is one of the important elements and factors that play a vital role in learning organization. The creative climate is the organization characteristics as perceived by its members (Ekvall, 1996). These characteristics include learning climate that encourage creativity and innovativeness (Ortenblad, 2002). The creative organizational climate encourages people to generate new ideas and helps the organization to grow and increase its efficiency and at the same time this climate enables members to generate and implement creative ideas more effectively (Ekvall et al., 1983 and Nystrom, 1990). Therefore, according to Isaksen and Lauer (1998) researchers and practitioners need to understand the relationship among creative organizational climate or organizational climate and effective learning organization. By understanding the elements of organizational climate that affect the people within these organizations, actions may be taken to improve the work environment in light of both environmental and psychological factors.

Researchers defined psychological climate factors as the analysis at the individual level that refers to the individual perceptions of the patterns of behavior. When aggregated, the concept is called organizational climate. These shared perceptions characterize life in the organization. According to Ekvall (1987) climate is perceived by individuals within the workplace and is considered as an attribute of organization. Many factors have been identified as relevant contributors of the creative behaviors among individuals and teams in organization. Most factors already considered as positive in contributing good climate for example creative climate (Ekvall et al., 1983). These factors include idea support, shared vision and goals, commitment to the team, challenge at work and trust in each other. Other factors have been considered as having a negative impact such as Ekvall's (1983) conflict factor and Organizational impediments (Amabile 1996)

The climate for creativity and change is that which promotes the generation, consideration and use of new products, services, ways of working and learning in organization. This climate for creativity supports the development, assimilation and utilization of new and different approaches and concepts.

Several literatures have been put forward to explore the relation and role of climate in organization (Ekvall, 1996, Woodman et al., 1993 and Burke and Litwin, 1992). Ekvall and Britz (2001) stated that organizational climate affects the relationship between individual and organizational performance due to its modifying effect on organizational and psychological processes. The organizational climate is influenced by many factors within the organization and as a result affects organizational and psychological processes. Organizational processes include group problem solving, decision-making, communication and coordination. Psychological processes include learning in the organization, individual problem solving, creating, motivating and committing (Ekvall and Britz, 2001).

Service and Boockholdt (1998) concluded that organizational climate is related to and has a major impact on psychological processes particularly in learning organization. Consequently, these components exert a direct influence on the performance and outcomes in individuals, working groups and the organization. This notion is in line with an integrated model of learning organization suggested by Ortenblad (2004), which constitutes four aspects mainly organizational learning, learning at work, learning structure and learning climate.

Preceding discussions and literature review revealed that creative organizational climate is related to learning organization. To explore creative organizational climate factors, several instruments have been developed by

researchers to measure this construct. Among the instruments are Business Organization Climate Index (Payne and Pheysey, 1971); Team Climate Inventory (Anderson and West, 1994); and Assessing the Climate for Creativity and Team Factors Inventory (Rickards and Moger, 1999). Ekvall et al. (1983) suggested creative climate questionnaire (CCQ) that constitutes of ten dimensions. These include challenge, freedom, dynamism/liveliness, idea support, playfulness/humor, debate, conflict, trust/openness, risk-taking and idea time. These dimensions were used to measure organizational conditions that stimulate or hamper creativity. Taking into account the evidence for instrument validation, ease of use, capability of modification and level of analysis CCQ was considered for this study.

RATIONAL OF THE STUDY

Study pertaining to creative organizational climate (Ekvall, 1996) and learning organization (Garvin 2000) has received considerable academic attention in the past few years. The prominence of these two concepts is further manifested by the abundant of theoretical and empirical studies on the topic that have emanated over the past few years. Further, while dimensions of creative organizational climate have been theorized to have an impact on many issues (Baer and Frese, 2003), no empirical testing of the relationship between these dimensions and learning organization exists to date, particularly among employees of private organization where knowledge generations has become one of the important agenda in achieving organization efficiency and effectiveness. In addition, arguments from prior research do suggest that creative organizational climate has an influence on learning organization (Service and Boockhold, 1998 and Ortenbald, 2004). Therefore, this study attempted to address the following questions: Is there a relationship between creative organizational climate and learning organization? Do creative organizational climate dimensions influence learning organization? And, what is the predictor of learning organization?

PURPOSE OF STUDY

The purpose of this study was to determine: (1) the relationship between dimensions of creative organizational climate and learning organization, (2) the influence of creative organizational climate dimensions on learning organization, and 3) the predictor of learning organization. Cognizance with the above objectives and consistent with related literature, this study proposes to test the following hypotheses:

Hypothesis 1:　　　　　There is a significant and positive relationship between challenge and learning organization;

Hypothesis 2:　　　　　There is a significant and positive relationship between freedom and learning organization;

Hypothesis 3:　　　　　There is a significant and positive relationship between dynamism/liveliness and learning organization;

Hypothesis 4:　　　　　There is a significant and positive relationship between idea support and learning organization;

Hypothesis 5:　　　　　There is a significant and positive relationship between playfulness/humor and learning organization;

Hypothesis 6:　　　　　There is a significant and positive relationship between debate and learning organization;

Hypothesis 7:　　　　　There is a significant and positive relationship between conflict and learning organization;

Hypothesis 8:　　　　　There is a significant and positive relationship between trust/openness and learning organization

Hypothesis 9:　　　　　There is a significant and positive relationship between risk-taking and learning organization

Hypothesis 10:　　　　　There is a significant and positive relationship between idea time and learning organization

RESEARCH METHODOLOGY

The data for this study were collected among 200 employees from lower and higher managerial level of the selected organization. The study adopted stratified random sampling, which covered managers of the selected telecommunication companies mainly in southern, eastern, western and northern part of Malay peninsular. The background profiles of the subjects are presented in Table 1.

Table 1: Background Characteristics of the Respondents

	Mean	SD	n	%
Age	34.40	6.61	-	-
Experience in the organization	11.01	6.80	-	-
Total job experience	5.56	3.29	-	-
Male	-	-	104	52
Female	-	-	96	48
Diploma/equivalent	-	-	38	19
Degree	-	-	162	81
Executive	-	-	112	56
Non executive	-	-	88	44
Private organization	-	-	133	66.5
Public organization	-	-	67	33.5

RESEARCH INSTRUMENTS

Data were collected by means of a closed questionnaire. The dependent variable of this study is learning organization. DLOQ scale developed by Watkins and Marsick (1993) was adapted to measure learning organization. DLOQ stands for "Dimension of Learning Organization Questionnaire". A seven-point Likert scale was used that ranges from almost never to almost always. The seven dimensions in the DLOQ instrument were measured by 6 to 7 items for each of the following dimensions: create continuous learning opportunities (7), promote inquiry and dialogue (6), encourage collaboration and team learning (6), establish systems to capture and share learning (6), empower people toward a collective vision (6), connect the organization to its environment (6) and provide strategic leadership for learning (6). The reliability coefficient for the overall of learning organizational scale was .93.

The independent variables of the study are creative organizational climate dimensions. Creative organizational climate was measured based on adapted instrument developed Ekvall et al. (1983). This instrument is Creative Climate Questionnaire (CCQ). A seven-point Likert scale was used that ranges from not relevant at all to very relevant at all. The questionnaire contains ten dimensions: challenge, freedom, dynamism/liveliness, idea support, playfulness/humour, debate, conflict, trust/openness, risk-taking and idea time. The instrument consists of five items for each of the ten dimensions. The reliability for the overall of CCQ scale was .94.

ANALYSIS OF DATA

The statistics used to test the hypotheses consisted of Pearson correlation coefficients and regression analysis. Pearson correlation coefficients analysis was done to determine the nature and direction of the relationships. Multiple regression analysis was used to determine the relationship between two and more independent variables and the dependent variable. This analysis results in the development of a formula that explains as much variance in the dependent variable as possible. It helped in identifying independent variables that could be combined to form the best prediction of the dependent variable. A stepwise regression analysis was used to examine the best predictors of learning organization. This stepwise regression method, built the model using one variable at a time, starting with the one that had the biggest contribution to the model. Successive variables were entered at successive stages of the model building process.

RESULTS

Pearson correlation coefficients were computed for the relationship between creative organizational climate dimensions and the overall learning organization scores rating (43 items) and to answer the first objective and hypothesis one to ten of the study. Table 2 shows the correlation matrix that reveals a significant and positive relationship between learning organization and dimensions of creative organizational climate**.**

Table 2: Intercorrelations among Dependent and Independent Variables

	1	2	3	4	5	6	7	8	9	10	11
1											
2	*0.82										
3	*0.78	*0.75									
4	*0.77	*0.76	*0.79								
5	*0.75	*0.60	*0.57	*0.60							
6	*0.70	*0.69	*0.67	*0.61	*0.78						
7	*0.64	*0.75	*0.82	*0.75	*0.60	*0.78					
8	*0.63	*0.82	*0.85	*0.81	*0.59	*0.65	*0.84				
9	*0.49	*0.45	*0.68	*0.60	*0.52	*0.67	*0.65	*0.58			
10	*0.47	*0.80	*0.76	*0.75	*0.61	*0.79	*0.82	*0.75	*0.57		
11	*0.37	*0.72	*0.60	*0.46	*0.44	*0.67	*0.79	*0.34	*0.58	*0.71	

Note, * $p < .05$
1. Liveliness   2. conflicts   3. Support of ideas 4. freedom 5. risk taking 6. challenge 7. humor 8. idea time 9. trust 10. debate 11. Learning Organization .

Table 3 presents the correlation between dependent and independent variables. As can be seen from Table 3, there is a positive relationship between learning organization and each of the creative organizational climate dimensions.

Table 3: Correlation Between Creative Organizational Climate and Learning Organization

Variables	r	Sig
Liveliness	.82	.000*
Conflicts	.78	.000*
Support of ideas	.77	.000*
Freedom	.75	.000*
Risk taking	.70	.000*
Challenge	.64	.000*
Humor	.63	.000*
Idea time	.49	.000*
Trust	.47	.000*
Debate	.37	.000*

Note, * $p < .05$

Findings of this study supported the hypothesis that learning organization was positively related to each of the creative organizational climate dimension. Therefore all hypotheses (hypothesis 1 to 10) in this study were accepted because the prediction of these hypotheses is supported by the data. As depicted from the summary correlation analyses in Table 3, the correlation coefficients for dimensions liveliness (r =.82), conflicts (r =.78), support of ideas (r = .77, freedom (r = .75) and risk taking (r =.70) were highly significant. Therefore, these creative organizational climate dimensions were positively correlated strongly to learning organization.

However, the relationship between learning organization and creative organizational climate dimensions of challenge (r = .64), humor (r = .63), idea time (r = .49) and trust (r = .47) indicated moderate and positive relationship. Meanwhile, the relationship between learning organization and creative organizational climate dimension of debate (r = .37) revealed low and positive relationship. The liveliness dimension of creative organizational climate score, explained the highest (67 percent), while debate dimension score, explained the lowest (14 percent) variance of learning organization.

The second objective of the study was to examine the influence of creative organizational climate dimensions on learning organization. Multiple regression analysis results as depicted in Table 4 revealed that, creative organizational climate factors was significantly related to the learning organization. The relationships were found to be very high and substantial (R = .88).

Based on the results in Table 4, all components of creative organizational climate were able to influence learning organization significantly at .05. The R square value of .78, showed that the regression model consisting of all the creative organizational climate dimensions was able to influence about 78 percent of the variations in

learning organization. This means 78 percent of the variance of learning organization was explained by a combined effect of all the creative organizational climate factors.

Table 4: Multiple Regression Analysis: Influence of Creative Organizational Climate Dimensions On Learning Organization

Independent variables	Beta	t	p
Creative Organizational Climate:			
Freedom	0.07	0.74	.460
Support of ideas	1.61	4.81	.000*
Challenge	1.25	1.63	.106
Trust/openness	0.24	3.61	.000*
Idea time	4.96	5.00	.000*
Risk taking	0.33	3.61	.000*
Liveliness/dynamism	1.85	5.19	.000*
Debate	0.12	1.91	.000*
Playfulness	0.06	0.73	.056
Conflicts	0.57	3.75	.467
(Constant)			.000
Multiple R = .88	R^2 = .78		
Adjusted R^2 = .77	$_{(10, 190)}$ = 67.14, Sig F= .000		

Note, * $p < 0.05$

The third objective of the study was to determine the influence of each creative organizational climate factors on learning organization. Stepwise multiple regression analysis results as shown in Table 5 indicates that liveliness/dynamism was the first independent variable to enter the analysis. This stepwise analysis yielded an R value of .82, reflecting the most powerful variable. The finding showed that liveliness/dynamism variable explained about 67.1 percent of variance in the learning organization. Support of ideas represented the second variable included in the analysis. This variable explained another 6.5 percent of the variance in the learning organization. This is followed by idea time, conflict and risk taking which explained 0.9, 0.8, and 0.6, percent of variance in learning organization respectively.

As depicted in Table 5, the five independent variables explained about 75.9 percent variation in learning organization. They are liveliness, support of ideas, idea time, conflicts and risk taking. The proposed prediction equation is as follows:

Table 5: Stepwise Multiple Regression Analysis of Creative Organizational Climate on Learning Organization

Variables		R	R^2	$+R^2$		Beta		Sig t
Liveliness/dynamism		.819	.671			2.06		.000
Support of ideas	.858	.737	0.065		1.79		.000	
Idea time		.863	.746	0.009		.53		.000
Conflict		.868	.753	0.008		.43		.000
Risk taking		.871	.759	0.006		.33		.000
(Constant)								.000
Multiple R = .871			R^2 = .759					
Adjusted R^2 = .761			$_{(5, 195)}$ = 270.71, Sig F= .000					

Note, * $p < 0.05$

$Y = 2.06X_1 + 1.79X_2 + .53X_3 + .43 X_4 + .33 X_5$

Y	=	Learning organization
X_1	=	Liveliness
X_2	=	Support of ideas
X_3	=	Idea time
X_4	=	Conflicts
X_5	=	Risk taking

In conclusion these five variables are the significant predictors of learning organization. However, liveliness emerged as the most significant predictor o influence of learning organization.

CONCLUSION, IMPLICATIONS AND SUGGESTIONS

The results of this study provide an interesting extension to research on the relationship between creative organizational climate and learning organization. The empirical results support our theoretical predictions and in general show the following: 1)There are significant relationships between creative organizational climate and learning organization; 2) all of the creative organizational climate dimensions simultaneously are able to contribute learning organization and 3) Creative organizational climate factors mainly liveliness, support of ideas, idea time, conflicts and risk taking are the significant predictors of learning organization. Findings of this study are consistent and supported by previous literature and studies (Ekvall and Britz , 2001; Service and Boockhold, 1998 and Ortenblad, 2004)

The study also contributed towards managerial applications. The internationalization of business has accelerated to the point at which nearly all companies affected by globalization, international linkages and development (Garland and Farmer, 1996). The critical dynamic suggests that success of any business organization depends on their approach of dealing with their employees. The management of human resources and the understanding of learning in any organizations is a complex and daunting task. The successful organization is likely to be one that can manage employment practices and perceptions of those practices by all groups of employees in a way that results in positive job related outcomes (Gaertner and Nollen, 1998).

The results of this study have shown a remarkable leading factor in predicting learning organization among managerial employees in organizations. However, this study is limited in the selected telecommunication companies and this may reduce the sensitivity of our analyses and the ability to detect small effects, but it also makes generalizing the results of the study to different setting more difficult. The question of generalizability is ultimately an empirical one which future investigation will answer.

To sum, this study serves as a starting point for future studies on the relationships between creative organizational climate and learning organization. It examines the predicting significant role of creative organizational climate on learning organization. Research in creative organizational climate has not been explored extensively in a non-western multicultural work setting particularly in Malaysia. Therefore, there is considerable territory yet to be explored. This paper explored some of this nascent territory. Finally, it is an initiative towards a greater understanding of organizational important aspects in the global business and learning organization and certainly would be very useful for the theoretical and practical purposes.

REFERENCES

Abidin,M.Z. (1999). The financial crisis and in Malaysia: The economic and political consequences. http://wwwjscassg/pub.html.

Amabile, T. (1996). *Creativity in context*. Boulder, Co. : Westview Press.

Amidon, D.M. (1996). The momentum of knowledge management. Journal for Industrial Research Institute, 5-6.

Anderson, N. and West, M. (1994). Measuring climate for work group innovation: development and validation of the team climate inventory. Unpublished manuscript, University of London: New Cross, London

Argyris, C. and Schon, D. (1978). *Organizational learning: A theory of action perspective*. Addison_Wesley, Reading :MA

Baer, M. and Frese, M. (2003). Innovation is not enough: Climate for initiative and psychological safety, process innovations and firm performance. Journal of Organizational Behavior, 24, 1-45.

Brown, M. M. and Brudney, J.L. (2003). Learning organizations in the public sector : A study of police agencies employing information and technology to advance knowledge. *Publiv Administration Review*, 63 (1) 30-43.

Burgoyne, J. and Pedler, M. (1994). *Learning companies: Their significance and characteristics*. Readings from The learning company conference.

Burke, W.W. and Litwin, G.H. (1992). A causal model of organizational performance and change. *Journal of Management*, 18, 523-545.

Cecilia, N. (1999). *Teleworking and Development in Malaysia*. UNDP and INTECH :United National University.

Confessore, S. J. and Kops, W.J. (1998). Self-directed learning and the learning organization: Examining the connection between the individual and the learning environment. *Human Resource Development Quarterly*, 9(4), 38-44.

Edmondson, A.C. (2002). The local and variegated nature of learning in organizations: A group-level perspective. *Organization Science*, 13, 128-146.

Ekvall, G. (1996). Organizational climate for creativity and innovation. *European Journal of Work and Organizational Psychology*, 5, 105-123.

Ekvall, G. (1987). The climate metaphor in organization theory. In Bass. B. and Drenth, P. (Eds), Advances in Organizational Psychology (pp. 177-190). Sage: Beverly Hills : CA.

Ekvall, G. and Britz, A. (2001). Perceptions of the best and worst climates for creativity: Preliminary validation evidence for the situational outlook questionnaire. *Creativity Research Journal*, 13 (2), 171-184.

Ekvall, G., Arvonen, J. and Waldenstorm, L.I. (1983). *Creative organizational cimate. Construction and validation of a measuring instrument*. Faradet, Report 2 the Swedish Council for Management and Work Life Issues: Stockholm.

Gaertner, K.N. & Nollen, S.D. (1998). Career experience, perceptions of employment practices and psychological commitment to the organization. *Human Relations*, 42, 975-991

Garland, J. & Farmer, R.N. (1996). *International dimensions of business policy and strategy*. Boston, MA: Kent.

Garratt, B. (1999). The learning organization 15 years on: Some personal reflections. *The Learning Organization*, 6(5), 202-206.

Garvin, D. (1993). Building a learning organization. *Harvard Business Review*, 8, 78-91

Geus, D. A. (1988). Planning as learning, *Harvard Bus. Rev*, 66, (70-74).

Huber, G. (1991). Organizational learning: The contributing processes and a review of the literature. *Organ. Science*, 2 (1), 88-115.

Isaksen, S.G. and Lauer, K.J. (1998). The relationship between cognitive style and individual psychological climate: reflections on a previous study. Creative problem Solving Group: Buffalo.

Knowles, M. (1984). The modern practice of adult education: From pedagogy to andragogy. New York : Cambridge University Press

Loermans, J. (2002). Synergizing the learning organization and knowledge management. *Journal of Knowledge Management*. 6 (3), 285-294.

Levitt, B. and March, J. (1988). Organizational learning. *Ann. Rev. Sociology*, 14, 319-340.

Marquardt, J. M. (2002). *Building the learning organization*. Palo Acto, CA: Davis-Black.

Malhotra, Y. (1996). *Organizational learning and learning organizations ; An overview*. available at : www.brint.com/papers/orglrng.htm.

Merriam, S.B. and Caffarella, R.S. (1991). *Learning in adulthood: A comprehensive guide*. San Francisco: Jossey-Bass.

Nonaka,I. And Takeuchi, K. (1995). *The knowledge creating company: How Japanese create the dynamics of innovation*. Oxford University Press : Oxford.

Nystrom, H. (1990). *Organizational innovation*, in West, M.A. and Farr, J.L. (Eds), Innovation and creativity at work, Wiley : Chichester.

Ortenblad, A. (2004). The learning organization: Towards an integrated model. *The Learning Organization*, 11(2), 129-144.

Ortenblad, A. (2004). A typology of the idea of learning organization. *Management Learning*, 33(2), 213-230.

Park, M (2001). Current economic trend. *Samsung Economic Research Institution Magazine*, 30(3), 45-48.

Payne, R. and Pheysey, D. (1971). G.C. Stern's organizational climate index: a reconceptualization and application to business organizations. Organizational Behavior and Human Performance, 6, 77-98.

Pedler, M., Burgoyne, J. and Boydell, T. (1991). *The learning company*. McGraw-Hill: London.

Rickards, T. and Moger, S. (1999).The development of benign structures: towards a framework for understanding exceptional performance in project teams, *The International Journal of New Product Development and Innovation Management*, 1 (2), 141-154.

Rosow, J.M. and Zager, R. (1988). *Training: The competitive Edge*. San Francisco: Jossey-Bass.

Schein, E. (1993). On dialogue, culture and organizational learning. *Organizational Dynamic*, 40-51.

Sandelands, E. (1999). Learning organizations: A review of the literature relating to strategies, building blocks and barriers. *Management Literature In Review*,1,1-10.

Senge, P.M. (1990). *The fifth discipline: The art and practice of learning organization*. Doubleday : New York.

Service, R.W. and Boockholdt, J.L. (1998). Factors leading to innovation: A study of managers' perspectives. *Creativity Research Journal*, 11, 295-307.

Stata, R. (1989). Organizational learning: The key to management innovation. *Sloan Management Rev*., 12 (1), 63-74.

Watkins, K.E. and Marsck, V.J. (1993). *Sculpting the learning organization: Lessons in the art and science of systematic change*, Sage: London.

Watkins, K.E., Yang,.B and Marsick, V.J. (1997). Measuring dimensions of the learning organization. In R. Torraco, *Proceeding of the Academy of Human Resource Development Conference*, pp 543-546. Academy of HRD : Atlanta, GA.

Woodman, R.W., Sawyer, J.E. and Griffin, R.W. (1993). Toward a theory of organizational creativity. *Academy of Management Review*, 18, 293-321.

Examining the Interface of Market Orientation and Quality Management Systems in Improving Organizational Performance

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ABSTRACT

Due to the increase in competitive pressure and the need to respond efficiently to customer needs, there has been a call for organizations to improve on their organizational performance. Organizations are searching for tools that can help them survive in the face of intense competition. In this paper the author will discuss on the integration of market orientation and quality management practices in helping an organization to improve their performance. The marketing concept holds that the key to achieving organizational goals consists of being more effective than competitors in integrating marketing activities toward determining and satisfying the needs and wants of target markets. TQM is defined as an ongoing process whereby top management takes whatever steps necessary to enable everyone in the organization in the course of performing all duties to establish and achieve standards, which meet or exceed the needs and expectations of their customers, both external and internal. Thus, this two concepts are essentials if the organization can integrate successfully the function of the departments which holds ownership in these areas.

INTRODUCTION

In the new age of economy where the issues of globalization and technology has taken place, many organizations are facing the pressure to improve on their organizational performance. The situation in this new world requires the organization to continuously redefine and reestablish the factors that will allow them to maintain their competitive edge and survival. Competition among organizations are very intense as the issues of survival are the main agenda of their activities.

As competition intensifies, firms are paying more attention to the increasing needs of customers. Customer needs and customer satisfaction has become the central of business operation today. This requires organization to change their operations from a production-oriented approach to a marketing oriented approach. At the same time, many firms today focus on quality management in their operation, which embrace the concept of total quality management (TQM). The concept has emerged as one of the most recent development in management practice around 1980s in the U.S. particularly in response to the competition from Japan.

MARKETING CONCEPT

The marketing concept states that the key to successful organizational goals are when a firm is more effective than competitors in creating, delivering and communicates superior customer value to its target market (Kotler, 2003). Thus, four basic pillars underlying the marketing concept are target market, customer focus, coordinated marketing and profitability.

The concept began to emerge in the mid-1950s. Keith (1960) suggest that marketing revolution has shifted from problems of production to problems of marketing, from the product the company can make to the product the consumer wants the company to make and from the company itself to the market place. Further remarks by Kotler and Levy (1969) in their article 'Broadening the concept of marketing' hold that marketing is the function of the organization, which can keep in constant touch with the organization's consumers, read their needs, and build a program of communications to express the organization's purpose. They argued that selling follows rather than precedes the organization's drive to create products to satisfy its consumers even though selling can influence the large parts of organizational marketing. Thus, at this stage, the company is no longer at the center of the business but the customer is at the center. This has led on to organization adopting marketing concept, which suggest that organization should be customer oriented, marketing decisions should be integrated in the corporate-wide management system, and that profits should be achieved through creating customer satisfaction.

MARKET ORIENTATION

Increase competition and the need to respond efficiently to customer needs lead to the term market orientation, which is accepted as the implementation of marketing concept. The implementation is reflected in the activities and behaviors of an organization rather than just a business philosophy as marketing concept was known (Kohli and Jaworski, 1990). Based on interviews with 62 managers in 47 organizations, Kohli and Jaworski (1990), develop a formal definition of market orientation:

"Market orientation is the organization wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization wide responsiveness to it".

Three main activities underlying this definition are generation of market intelligence, dissemination of intelligence, and responsiveness to market intelligence. Instead of the philosophical statement in the marketing concept, these three sets of activities represent the operationalization of a market orientation (Diamantopoulous and Hart, 1993).

Narver and Slater (1990) develop a measure of market orientation and test its effect on a business profitability using a sample of 140 business units, consisting of commodity products businesses and noncommodity businesses found out that market orientation and performance are strongly related. Their findings suggest market orientation have a positive effect on the profitability of the business. Further research by Jaworski and Kohli (1993) to address why some organizations are more market-oriented than others, the effect of a market orientation on employee and business performance and the environmental factors that affect the linkage between market orientation and business performance suggest that market orientation of an organization is an important determinants of its performance, regardless of the market turbulence, competitive intensity, or the technological turbulence of the environment in which it operates. However, no relationship was found in the study between market orientation and market share.

Recent study also support that market orientation as one of the key dimensions of corporate management and as a critical factor for corporate success. For example, Wolfgang (1996) identified that market orientation is one of the important critical factor for corporate successes. However, he did acknowledged that certain measures of implementation, which enhance the market orientation can lead to undesired negative side effects. Therefore, it is essential to control these side effects in order to achieve the desired success of implementation.

Pitt, Caruana and Berthon (1996) in their study of market orientation and business performance in the United Kingdom (UK) and Malta suggest that the effect on performance of both countries are similar although Malta is a developing country as opposed to the UK and most other Western European countries. Recent research (Sin and Tse, 2003) in Hong Kong and mainland China also suggest that market orientation has a significant and positive impact on the performance of firms. Thus, the above findings provide support that market orientation is a reliable scale, which can be used across a variety of boundaries such as companies, cultures, industries and the level of economic development.

TOTAL QUALITY MANAGEMENT

Quality can be defined in many different ways depending upon the orientation of the individual involved. Garvin (1984) propose five basic terms that constitute a definition of quality; transcendent, product-based, user-based, manufacturing-based, and value-based. He argued that individuals from different departments within the organization define the concept of quality, based on their different perspectives. Thus, taking into this context, quality has been defined variously such as conformance to requirements (Crosby, 1979), the development, design, production and service of a product that is most economical, most useful, and always satisfactory to the customers (Ishikawa, 1985), a predictable degree of uniformity and dependability at a low cost with a quality suited to the market (Deming, 1986), the loss a product causes to society after being shipped (Taguchi, 1986), product performance which results in customer satisfaction (Juran, 1988), keep the service promise (Gronroos, 1990) and satisfying or delighting the customers (Spencer, 1994).

Based on the early definitions of quality concept and the evolution of TQM, Miller (1996) develops a definition of TQM to serve as a reference point for those interested in doing research on the topic. He defined TQM as:

"An ongoing process whereby top management takes whatever steps necessary to enable everyone in the organization in the course of performing all duties to establish and achieve standards which meet or exceed the needs and expectations of their customers, both external and internal".

Alternatively, Mohr-Jackson (1998) offered a formal definition of total quality orientation:

"Total quality orientation is the organization-wide commitment to continuos improvement for delivery of customer-perceived quality and ultimately customer satisfaction".

One of the study that examines the impact of TQM on the performance of 108 firms that began TQM implementation between 1981 and 1991 found out that performance measured by both accounting variables and stock return is improved for the firms adopting TQM (Easton and Jarrell, 1998). Similarly, other study also provided evidence that TQM practices has an impact on a firm's financial result (Tena, Llusar & Puig, 2001) and an indirect impact on financial performance mediated by competitive advantage (Arawati Agus & Ridzuan Mohd Sagir, 2001). Thus, the above findings suggest that firms adopting TQM practices has an impact on organizational performance and indirectly enhance competitive advantage.

ISO 9000 standards can offer a good first step towards TQM since it boosts quality culture and quality improvement and it offers significant improvement in companies' performance (Gotzaimi & Tsiotras, 2001). Top management can use eight quality management principles have been embedded into the quality management system in order to lead organization towards improved performance (ISO, 2000):

a) Customer focus
   Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations

b) Leadership
   Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

c) Involvement of people
   People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit

d) Process approach
   A desired result is achieved more efficiently when activities and related resources are managed as a process

e) System approach to management
   Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives

f) Continual improvement
   Continual improvement of the organization's over
   All performance should be a permanent objective of the organization

g) Factual approach to decision making
   Effective decisions are based on the analysis of data and information

h) Mutually beneficial supplier relationships
   An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value

MARKET ORIENTATION, TQM AND ORGANIZATIONAL PERFORMANCE

Market orientation emphasizes on an organization wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization wide responsiveness to it. While TQM emphasize that every individual in the organization is involved in performing duties, which meet or exceed the needs and expectation of their customers internally and externally. Thus, there are synergies between these two concepts,

which suggest that every individual in the department of the organization should focus on meeting customer needs and ultimately result in customer satisfaction. Furthermore, these two concepts share that an organization should work as an interrelated collection of processes rather than an interacting set of functional units.

Day (1994), proposed a comprehensive change program to enhance organizational performance by combining these two concepts or approaches with the following elements:

- "Diagnosis of current capabilities, using mapping and benchmarking methodologies,
- Anticipation of future needs for capabilities in light of the strategy for creating customer value,
- Bottom-up redesign, based on the formation of teams responsible for continuos improvement or radical redesign of underlying processes,
- Top-down direction from senior managers, who demonstrate a clear, continuing commitment to putting customer first,
- Use of information technology to enable the organization to do things it could not do before, and
- Monitoring of progress toward improvement targets"

Thus, this suggests that linking market orientation and TQM has the potential in improving organizational performance. Mohr-Jackson (1998) lists a number of potential benefits to the marketing by taking more responsibilities in quality management. She states that the adoption of TQM is critical for successful application of the marketing concept within a firm and TQM can provide a vehicle for increasing communication and co-operation between marketing and other functions, including operations and production.

CONCLUSION

TQM is defined as an ongoing process whereby top management takes whatever steps necessary to enable everyone in the organization in the course of performing all duties to establish and achieve standards, which meet or exceed the needs and expectations of their customers, both external and internal (Miller, 1996).

The marketing concept holds that the key to achieving organizational goals consists of being more effective than competitors in integrating marketing activities toward determining and satisfying the needs and wants of target markets (Kotler, 1997).

From the above discussion, it is noted that these two concepts suggest that an organization to focus on integrating activities to be responsive to customer needs. Identifying customer needs is important as this will determine whether the organization meet those requirements. The requirements identified can be translated to the process of producing output. Marketing play the role in helping the organization determining the customer needs, while other functions play the role in producing the product or service according to customer needs. Thus, both play a major role in satisfying the stakeholders in an effective and efficient manner, which may enhance organizational performance.

REFERENCES

Arawati Agus & Ridzuan Mohd Sagir (2001). The structural relationships between total quality management, competitive advantage and bottom line financial performance: An empirical study of Malaysian manufacturing companies. *Total Quality Management*, 12(7/8), 1018-1024

Crosby, P.B. (1979). *Quality is free: The art of making quality certain*. McGraw-Hill, New York, pp. 309.

Day, G.S. (1994). The capabilities of market-driven organizations. *Journal of Marketing*, Vol.58, pp. 37-52.

Deming, E.W. (1986). *Out of the crisis, Center for Advanced Engineering Study*. MIT, Cambridge, MA, pp.507

Diamantopoulous, A and Hart, S. (1993). Linking market orientation and company performance: preliminary evidence on Kohli and Jaworski's framework. *Journal of Strategic Marketing*, 1, p 93-121.

Easton, G.S. and Jarrel, S.L. (1998). The effects of total quality management on corporate performance: An empirical investigation. *Journal of Business*, vol. 71, no.2

Garvin, D.A. (1984). What does product quality really mean?. *Sloan Management Review*, Vol.25, pp.25-43.

Gotzamani, K.D. & Tsiotras, G.D. (2001). An empirical study of the ISO 9000 standards' contribution towards total quality management. *International Journal of Operations & Production Management*, 21(10), 1326-1342.

Gronroos, C. (1989). Defining Marketing: A Market-oriented approach. *European Journal of Marketing*, Vol.23, No.1

Groonroos, C. (1990). *Service management and marketing: Managing the moments of truth in service competition*, Lexington, M.A., pp. 298

Gummesson, E. (1991). Marketing-orientation revisited: The crucial role of the part-time marketer. *European Journal of Marketing*, Vol.25, No.2, pp. 60-75

Hooley, G., Lynch, J.E., and Sheperd, J. (1990). The marketing concept: Putting the theory into practice. *European Journal of Marketing*, Vol. 24(9), pp. 7-23.

Ishikawa, K. (1985). *What is total quality control? The Japanese way*. Prentice-Hall, Englewood Cliff, pp. 215.

ISO (2000). *Quality management systems – Fundamentals and vocabulary (ISO 9000: 2000, IDT*). Switzerland: Department of Standards Malaysia.

Jaworski, B.J. and Kohli, A.K. (1993). Market orientation: antecedents and consequences. *Journal of Marketing*, Vol. 57, July, pp 53-70.

Juran, J.M. (1988). *Juran on planning for quality*. The Free Press, New York, pp. 341.

Keith, R.J. (1960). The marketing revolution. *Journal of Marketing*, Vol. 24, no. 3(January), p 35-38.

Kohli, A.K. and Jaworski, B.J. (1990). Market orientation: the construct, research propositions, and managerial implications. *Journal of Marketing*, Vol. 35, April, pp. 1-18.

Kotler, P and Levy, S.J. (1969). Broadening the concept of marketing. *Journal of Marketing*, Vol. 33, pp 10-15

Kotler, P. (1997). *Marketing Management: Analysis, Planning, Implementation, and Control (9th ed.)*. New Jersey: Prentice Hall.

Kotler, P. (2003). *Marketing Management (11th ed.)*. New Jersey: Prentice Hall.

Miller, W.J. (1996). A working definition for total quality management (TQM) researchers. *Journal of Quality Management*, Vol. 1, No.2, pp. 149.

Mohr-Jackson, I. (1998). Conceptualizing total quality orientation. *European Journal of Marketing*, Vol. 32, No.1/2, pp. 13-22.

Pitt, L., Caruana, A. and Berthon, P.R. (1996). Market orientation and business performance: some European evidences. *International Marketing Review*, Vol. 13, no. 1, pp. 5-18.

Sin, L.Y.M. and Tse, A.C.B. (2003). Market orientation and business performance: A comparative study of firms in mainland China and Hong Kong, *European Journal of Marketing*, Vol. 37, No.5/6, pp. 910-936.

Spencer, B.A. (1994). Models of organization and total quality management: a comparison and critical evaluation. *Academy of Management Review*, July, pp. 446-471

Taguchi, G. (1986), *Introduction to quality engineering: Designing quality into products and processes*, The organization, Tokyo, pp. 191

Tena, A.B.E., Llusar, J.C.B., & Puig, V.R. (2001). Measuring the relationship between total quality management and sustainable competitive advantage: A resource-based view. *Total Quality Management*, 12(7/8), 932-938

Wolfgang, F. (1996). Market orientation and corporate success: Findings from Germany, *European Journal of Marketing*, Vol. 30, 8, pp. 59

Improving Organizational Commitment Through Job Characteristics

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ABSTRACT

This study examines the relationship between job characteristics and organizational commitment. Basically, commitment is influenced by a combination of environmental characteristics, job characteristics, and demographic characteristics. However, management can hardly control environmental characteristics. Organizational commitment consists of three main components. They are affective, continuance and normative commitment. While job characteristics comprised of six components which are variety, autonomy, task identity, feedback, dealing with others and friendship opportunities. The study has found that all four dimensions of job characteristics are positively related to organizational commitment yet only task identity and feedback are highly related to organizational commitment. The study also reveals that managers' desires to remain in the same organization not solely because they want to or it is a moral obligation to do so but also due to the influence of the characteristics of their jobs mainly task identity and feedback. Therefore, in order to enhance organizational commitment employers should develop intrinsically motivating job by designing job that allows employees to get involve in performing the entire works from the very beginning to the end and also by providing continuous feedback on how well they are doing in their jobs.

INTRODUCTION

High turnover rate has become a compelling reason for most organizations to pay careful attention to organizational commitment especially in today's dynamic business environment. This is because employee turnover may reduce the strength of the organization to compete successfully. According to Benkhoff (1997), organizational commitment has continuously been the most exciting issue to be studied because it is often seen as the key to business success. Several studies have found to support for the relationships between organizational commitment and various indicators of organizational effectiveness such as absenteeism (Iverson and Butigeg,1999) and turnover (Allen and Meyer, 1990). Findings showed that the stronger an employee's commitment to the organization, the less likely the person to quit. Consequently, knowledge of the commitment is very crucial since it enables organization to manage withdrawal behaviors.

Commitment is influenced by a combination of environmental characteristics namely external job opportunities, job characteristics such as job feedback, skills variety, autonomy and demographic characteristics like gender, age, level of education. However Fang (2001) claimed that management could hardly control environmental characteristics. Therefore this study which will be focusing on job characteristics, attempts to determine the relationship between organizational commitment and job characteristics and to examine which characteristics of the job is significantly related to organizational commitment.

LITERATURE REVIEW

Organizational Commitment

Previous researchers have proposed a variety of definitions of organizational commitment. Meyer and Allen (1991) defined organizational commitment as a psychological state that characterizes the employee's relationship with the organization and influences their decisions to remain in the organization. While Agarwal and Ramaswami (1993) interpreted organizational commitment as a strong desire of employee to stay on in an organization even though there is opportunity to change work. Bettencourt and Brown (1997) further explained that the desire exist because the person personally attached to and care about the future of an organization.

Several studies have been done to identify the antecedents of organizational commitment which include personal characteristics (Mathieu and Zajac, 1990), job characteristics (Bhuian,1996), job satisfaction (Bartol, 1979) as

well as the outcomes of organizational commitment especially on work performance and turnover (Iverson and Buttigieg, 1999; Cotton and Turtle, 1986).

Allen and Meyer (1996) categorized commitment into three main components. They are affective, continuance and normative commitment. They also developed an instrument consists of 24 items to measure those components.

Affective Commitment

The affective component refers to the employees' emotional attachment to, identification with and involvement in the organization (Allen and Meyer, 1990). Affectively committed employees may remain in organizations because they wish to maintain membership in the organization. When employees show affective commitment they want to stay with the organization, express their loyalty for their organizations and speak frequently to others of their organizations (Leede and Looise, 2001). Dunham, Grube and Castaneda (1994) found that employee's affective commitment increases when he/she is given more autonomy in performing job, obtains support from coworkers and supervisors and has opportunities for promotion.

Continuance Commitment

The continuance component refers to commitment based on the costs that the employees associate with leaving the organizations (Allen and Meyer, 1990). Leede and Looise (2001) further explained that employees assess the perceived utility of remaining with the organization comparing it to leaving. Continuancely committed employees remain in the organization when they have invested a lot in the organization, which they will loose if leaving the organizations. Mathieu and Zajac (1994) found that organizational tenure is positively related to continuance commitment. They attribute this relationship to the increased attachment and investment that have been made to the organization over time.

Normative Commitment

The normative component refers to the employee's feelings of obligation to remain with the organization (Allen and Meyer, 1990). Employees who are normatively committed think they ought to remain with the organization since it would be unfair to superiors or co-workers and morally wrong for not being loyal to the organization. Harris et al. (1993) reported that autonomy is positively related to normative commitment. They explained this positive relationship as a result of greater experience of responsibility for work.

Job Characteristics

Studies on job characteristics have been attracting many researchers and managers since the problem of employee's satisfaction and performance gets attention. Hence, a lot of efforts have been taken for instance designing program of job enrichment and enlargement to assist managers particularly in redesigning jobs in order to overcome those problems (Hackman and Oldham, 1984).

Sims, Szilagyi and Keller (1976) developed a job characteristics model based on Turner and Lawrence's (1965) and Hackman and Lawler's (1971) research and suggested six core characteristics that have motivating potential. They include variety, autonomy, task identity, feedback, dealing with others and friendship opportunities.

Variety

Variety addresses the degree to which a job allows employees to engage in a wide range of options in their work. (Sims, Szilagyi and Keller, 1976). Bhuian (1996) who studied on the influence of job characteristics on organizational commitment found that variety is a significant factor impacting the level of commitment of Saudi Arabia expatriates. Yet, Steers (1977) reported that no significant relationships exist between variety and commitment of scientists, engineers and hospital employees.

Autonomy

Autonomy refers to the extent to which employees have freedom to do what they want on the job. (Sims, Szilagyi and Keller, 1976). Loscocco (1990) who studied on perception of blue collar workers on organizational commitment, noted that women as well as men prefer jobs that are more challenging, and high in variety and autonomy. Thus, the idea of women are less committed compared to men is rejected. Nevertheless Colbert (2000) found no significant relationship between autonomy and commitment of internal university auditors who are responsible for ensuring policy and procedures dictated by top management is followed and obeyed.

Task Identity

Task identity refers to the extent to which employees do a whole piece of work and can identify the result of their efforts (Sims, Szilagyi and Keller, 1976). Ramaswami, Agarwala and Bhargala (1993) reported that task identity is positively related to organizational commitment of employees in early and middle career stages (employees below forty years old) yet, negatively related to those in final career stage. They explained that the commitment of employees above forty years old decreases when they are given many responsibilities (such as to perform works from the very beginning to the end by themselves) because they would see it as burden. However, Bhuian, al-Shammari and Jefri (1996) found no significant relationship between task identity and commitment of Saudi Expatriates. They argued this is due to different cultural orientation that is in Saudi Arabia, they normally emphasize on group work rather than individual work.

Feedback
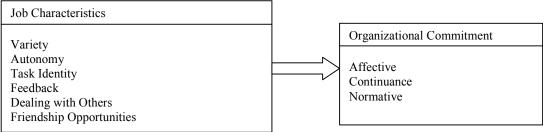
Feedback is the degree to which employees receive information as they are working which reveals how well they are performing on the job (Sims, Szilagyi and Keller, 1976). Dunham, Grube and Castaneda (1994) found that feedback is positively related to organizational commitment. The study was done on police officers, administrators' personnel and professional and part time employees from various organizations.

Dealing with Others and Friendship Opportunities

Dealing with others assesses the degree to which a job requires employees to deal with other people to complete the work while friendship opportunities measures the degree to which a job allows employees to establish informal relationship with other employees at work. (Sims, Szilagyi and Keller, 1976). Despite the existence of studies exploring the relationships of job characteristics and organizational commitment based on component variety, autonomy, task identity and feedback, no study, as per our search, has yet studied the relationship based on component dealing with others and friendship opportunities. Duke and Sneed (1989) reported that dealing with others is positively related to job satisfaction of student employees in university foodservice. Whereas friendship opportunities has been found to be a significant factor influencing the level of job satisfaction of employees at university cafeteria. Even though these two components have not been proven significantly related to organizational commitment, several studies have found strong relationship between job satisfaction and organizational commitment (Porter and Steers, 1973; Dubinsky and Borys, 1981)

Research Framework

Figure 1: The Relationship Between the Variables

Job Characteristics	Organizational Commitment
Variety Autonomy Task Identity Feedback Dealing with Others Friendship Opportunities	Affective Continuance Normative

The main purpose of this study is to look at the relationship between job characteristics and organizational commitment. The dependent variable is organizational commitment while the independent variable is job characteristics. Job characteristics consists of six dimensions namely variety, autonomy, task identity, feedback,

dealing with others and friendship opportunities. Organizational commitment comprised of three dimensions particularly affective, continuance and normative commitment. The relationship of the above mentioned variables are depicted in the figure 1.

METHODOLOGY

Measures

The independent variable that is job characteristics consists of six dimensions include variety, autonomy, task identity, feedback, dealing with others and friendship opportunities. They were measured using 32 items to determine the respondents' perception of the presence of each core job dimension in his/her job. The questions were adapted from the Job Classifications Index (JCI) developed by Sims, Szilagyi and Keller (1976). They were measured on a 5-point likert scale (1=strongly disagree to 5=strongly agree).

The dependent variable that is organizational commitment comprised of three components. They are affective, continuance and normative commitment. They were measured using 24 items. The items were adapted from the Organizational Commitment Scale developed by Allen and Meyer (1990) using a 5-point likert scale (1=strongly disagree to 5=strongly agree).

Data Collection Method

Pilot study was conducted at TAKEUCHI MDF Sdn Bhd, a manufacturing company in Johor. Ten sets of questionnaires were distributed to managers and the questionnaires were modified based on the feedback from the respondents. A total of 261 sets were distributed personally and via mail to manufacturing companies in Johor and listed in the Federation of Malaysian Manufacturers (FMM) 2001. A total of 72 questionnaires were collected, which made up a return rate of 27.5%. The data was analyzed by *Statistical Packaged for Social Science* (SPSS) Version 11.0

Population and Sampling

The population comprised of managers who involved directly or indirectly in production operation excluded those in top management in manufacturing companies in Johor. They are chosen because they play important roles in ensuring organizational goals achieved hence, their commitment are very critical to the organization. A sample of 261 was drawn from all manufacturing companies identified using convenience sampling.

Factor Analysis Results

The Organizational Commitment and Job Characteristics Items

Table 1: Varimax Rotated Factor Matrix of Organizational Commitment

Items and Factor description	Factor Loading		
Organizational Commitment	Factor 1	Factor 2	Factor 3
Organizational problems are own problems	.856		
Organization as part of family	.785		
Emotionally attached to organization	.745		
Quitting job without another lined up		.765	
Scarcity of available alternative		.862	
Leaving requires personal sacrifice		.840	
A person must be loyal to organization			.765
Jumping organization is unethical			.707
It is a moral obligation to remain in organization			.843
It is not right to leave for another job			.776
Taught to believe in the value of remaining loyal			.814
Things were better in the days when people stayed with one organization for most of their career			.736

Table 2: Varimax Rotated Factor Matrix of Job Characteristics Items

Items and Factor description	Factor Loading				
Job Characteristics	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Supervisor leaves a lot of work	.619				
See projects through to completion	.757				
Able to work without supervisor	.801				
Able to work without others	.666				
Often handle the whole work alone	.834				
Have control over work	.681				
Always have opportunity to do the while work	.732				
Plenty opportunity to talk informally		.720			
Job allows forming friendship		.771			
Plenty opportunity to talk to others		.824			
Job allows knowing others		.585			
Opportunity to develop friendship		.696			
Can tell how I am doing by performing the work			.627		
Supervisor always gives feedback			.823		
I could feel when I perform well			.659		
Always receive feedback from other than supervisor			.665		
Job depends heavily on working with other				.823	
A part of job is to deal with others				.828	
Job allows meeting with other people				.631	
Job requires using a variety of skills					.790
Job gives opportunity to make friendship					.522
The amount of variety in job is high					.844

The results of Principal Component Analysis of organizational commitment and job characteristics are presented in Table 1 and 2. The varimax rotation of 24 organizational commitment items produced three factors while 32 job characteristics items produced five factors. Factors with at least three items and eigenvalue one and above are remained for further statistical analysis. The three factors extracted were named as Affective, Continuance and Normative whereas the five factors were named as Task Identity, Friendship Opportunities, Feedback, Dealing With Others and Variety.

Validity and Reliability

Table 3: Reliability Coefficients of Variables

Factors	Cronbach α
Dependent Variables	
Affective Commitment	0.77
Continuance Commitment	0.80
Normative Commitment	0.89
Independent Variables	
Task Identity	0.86
Feedback	0.70
Dealing with Others	0.76
Friendship Opportunities	0.83

Reliability test was carried out using the inter-item internal consistency and the alpha values were found to exceed 0.7. However, variety was found to have low reliability, thus it was omitted for further analysis. The reliability results for all the variables are reflected in Table 3.

FINDINGS

This study examines which dimension in job characteristics is the most important factor in explaining organizational commitment.

Relationship Between Dimension of Job Characteristics and Organizational Commitment

Table 4: Correlation Coefficients Between Job Characteristics and Organizational Commitment

Item	1	2	3	4	5
Organizational Commitment	1				
Task Identity	.528**	1			
Friendship Opportunities	.225	.136	1		
Feedback	.359**	.268*	.177	1	
Dealing with Others	.067	.128	.457**	0.55	1

Note: **p<0.01   * p<0.05

Table 5: Correlation Coefficients Between Job Characteristics and Affective Commitment

Item	1	2	3	4	5
Organizational Commitment	1				
Task Identity	.429**	1			
Friendship Opportunities	.051	.136	1		
Feedback	.340**	.268*	.177	1	
Dealing with Others	.058	.128	.457**	0.55	1

Note: ** p<0.01   * p<0.05

Table 6: Correlation Coefficients Between Job Characteristics and Continuance Commitment

Item	1	2	3	4	5
Organizational Commitment	1				
Task Identity	.341**	1			
Friendship Opportunities	.312**	.136	1		
Feedback	.092	.268*	.177	1	
Dealing with Others	.169	.128	.457**	0.55	1

Note: ** p<0.01   * p<0.05

Table 7: Correlation Coefficients Between Job Characteristics and Normative Commitment

Item	1	2	3	4	5
Organizational Commitment	1				
Task Identity	.413**	1			
Friendship Opportunities	.141	.136	1		
Feedback	.371	.268*	.177	1	
Dealing with Others	-.073	.128	.457**	0.55	1

Note: ** p<0.01   * p<0.05

As indicated in Table 4, two out of four dimensions of job characteristics that are task identity and feedback have positive relationship with organizational commitment. While, friendship opportunities and dealing with others fail to show any reliable relationship with the organizational commitment variable. Then, a more detailed relationship between each dimension of job characteristics and affective, continuance and normative commitment have been analyzed. The results indicate that only two job characteristics dimensions namely task identity and feedback show significant relationships with affective and normative commitment. The result

also shows that dimensions task identity and dealing with others have significant relationships with continuance commitment. Complete results are showed in the Table 5,6 and 7 above.

Multiple Regressions of Job Characteristics Dimensions and Organizational Commitment

Table 8: Multiple Regressions Analysis of Job Characteristics and Organizational Commitment

Item	*Standardized Coefficients*		
	Beta	t	Sig.
(Constsnt)		1.393	0.168
Task Identity	0.460	4.460	0.000**
Friendship Opportunities	0.160	1.424	0.159
Feedback	0.212	2.048	0.044*
Dealing with Others	-0.077	-0.689	0.493

Note: ** p<0.01   * p<0.05

As shown in Table 8 above, 35% of the variance (R^2=0.350) in organizational commitment has been significantly explained by the four dimensions of job characteristics which include task identity, friendship opportunities, feedback and dealing with others. The Beta value of .460 for task identity and followed by .212 for feedback indicate that these two dimensions are very important in explaining organizational commitment.

All four dimensions of job characteristics are positively related to organizational commitment yet only task identity and feedback are highly related to organizational commitment. It can be concluded that only task identity and feedback are significant in enhancing organizational commitment.

DISCUSSIONS

The purpose of this study is to determine relationship between the four dimensions of job characteristics and organizational commitment. They are task identity, friendship opportunities, feedback and dealing with others. Having examined the four dimensions in the current study has allowed us to understand the relationship between job characteristics and organizational commitment.

Overall, this study shows that job characteristics has significant relationship with organizational commitment (or affective and normative commitment based on analysis on each dimension of organizational commitment), which is parallel to Flynn and Tannenbaum's (1993) and Dunham, Grube and Castaneda's (1994) studies. Managers' desires to remain in the same organization not solely because they want to or it is a moral obligation to do so but also due to the influence of the characteristics of their jobs. They have been given opportunities to fully involve in performing jobs. Besides that, they have also been given continuous feedback on how well they do in their jobs. According to Hackman and Lawler (1971), these opportunities will make them feel personally responsible for their works hence, increase their motivation and finally influence their desire to remain.

Nevertheless, two dimensions of job characteristics namely dealing with others and friendship opportunities have been found no significant relationship with organizational commitment. This means that managers' desires to stay on in organizations do not influenced by the above-mentioned factors. However due to lack of previous studies on the relationship between job characteristics (emphasizing dimensions of dealing with others and friendship opportunities) and organizational commitment, the comparison of the findings can hardly be done.

In addition, further analysis on the relationship between job characteristics and continuance commitment reveals that managers' desires not to leave the organizations because not only they do not want to bare the costs that they will associate with leaving the organizations but also as a result of having opportunity of making friendship with others at work. They consider friendship opportunities as an informal way to know others for various reasons such as to help in performing works or to maintain position in the organizations. Also the factor of having chances to perform works from the very beginning to the end has influenced their commitment to the organizations because they perceive their works are meaningful. This feeling according to Hackman and Oldham (1975) will influence positively on the attitude of individuals.

CONCLUSIONS

Based on the results of the study, the relationship between job characteristics and organizational commitment reveals some implications to managerial practices. Being an important group in organization, managers' commitment should not be ignored. The objectives of this study have been achieved whereby the results have proved that job characteristics is related to organizational commitment. Among the four dimensions of job characteristics, only task identity and feedback were found to be important factors in determining employee's commitment to organization. Therefore, employers who are struggling to enhance manager's commitment should consider this approach, that is to develop intrinsically motivating job by designing job that allows employees to get involve in performing the entire works from the very beginning to the end and also by providing continuous feedback on how well they are doing in their jobs. Since the result suggested that not all factors in job characteristics have significant contribution towards organizational commitment, employers should be very careful when considering friendship opportunities and dealing with others.

REFERENCES

Agarwal, S., & Ramaswami, S. N. (1993), Affective Organizational Commitment of Salespeople: An Expanded Model, *Journal of Personal Selling and Sales Management*, 13, (Spring): 49-70.

Allen N. J. & Meyer J. P. (1990), The measurements and antecedents of affective, continuance and normative commitment to the Organization, *Journal of Occupational Psychology*, 63: 1-18.

Appelbaum D. L. (2000), Worker motivation, Commitment and Work Effort: A Psychological Perspective, Technical Paper.

Awamleh, N.A. (1996), Organizational Commitment Civil Service Managers in Jordan: A Field Study, *Journal of Retailing,* 73 (Spring): 39-61.

Bhuian, S.N., Al-Shammari, E.S. & Jefri, O.A. (1996), Organizational Commitment, Job Satisfaction and Job Characteristics: An Empirical Study of Expatriates in Saudi Arabia, *International Journal Of Commerce Management*, 6 (3/4): 57-80.

Bhuian, S.N. & Menguc, B. (2002), An Extension and Evaluation of Job Characteristics, Organizational Commitment and Job Satisfaction in an Expatriate, Guest Workers, Sales Setting, *Journal of Personnel selling & Sales Management*, 22 (1).

Colbert, A. E. & Kwon, I. G. (2000), Factors Related to the Organizational Commitment of College and University Auditors, *Journal of Managerial Issues*, 12 (4): 484-501.

Cotton, J.L. & Tuttle, J.M. (1986), Employee Turnover: A meta-analysis and review with implications for research, *Academy of Management Review*, 11: 55-70.

Dubinsky, A.J. & Borys, R.H. (1981), A Path Analytic Study of Causes and Consequences of Retail Salespeople's Role Conflict and Ambiguity, in Dubinsky, A.J. and Skinner, S.J. (1984), Impact of Job Characteristics, *Journal of Retailing*, 60 (Summer): 35-62.

Dubinsky, A.J. and Skinner, S.J. (1984), Impact of Job Characteristics on Retail Salespeople's Reaction to Their Jobs, *Journal of Retailing*, 60 (Summer): 35-62.

Duke, K.M. & Sneed, J. (1989), A Research Model for Relating Job Characteristics to Job Satisfaction of University Foodservice Employees, *Journal of the American Dietetic Association*, 89 (8): 1087-91.

Fang, M. (2001), *Job Characteristics and Self-efficacy as Predictors of organizational commitment*, Published Marsters Dissertation, University of Nevada, Las Vegas.

Hackman, J. R. & Lawler, E.E. III (1971), Employee reactions to Job Characteristics, *Journal of Applied Psychology Monograph*, 55: 259-286.

Hackman, J.R. & Oldham, G.R. (1975), Development of the Job Diagnostics Survey*, Journal of Applied Psychology,* 60: 159 - 170.

Hackman, J.R. & Oldham, G.R. (1980), *Work Redesign*, Massachussette: Addison-Wesley Publishing Company.

Harris, S.G. Hirschfeld, R.R., Field, H.S. & Mossholder, K.W. (1993), Psychological attachment: Relationships with job characteristics, attitudes and preferences for newcomer development, *Group & organization Management,* 18: 459-481.

Iverson, R.D. & Buttigieg, D.M. (1999), Affective, Normative and Continuance Commitment: Can the "right kind" of commitment be managed*?, Journal of Management Studies*, 36 (3).

Leede, J.D. & Looise, J.C. (2001), Demanding More Than People Can Deliver: Exploring The Issue Of Loyalty and Commitment In Enterprise Collaborations, *Production Planning & Control*, 12 (5): 504-513.

Loscocco, K.A. (1990), Reactions to Blue-Collar Worker, *Journal Work & Occupations*, 17(2).

Mathieu, J.P. & Allen, J.N. (1991), A Three-Component Conceptualization of Organizational Commitment, *Human Resource Management Review*, 1: 61-98.

Rachel A. G., Brian, P.N. & Judy, L.M. (2000), The Effect Of Job Characteristics On Student Employee Job Satisfaction And Intent To Turnover In College And University Foodservice, *The Journal Of The National Association Of College & Foodservices*, 22: 4-56.

Ramaswami, S.N. , Agarwal, S. & Bhargala, M. (1993), Work Alienation Of Marketing Employees: Influence of Task, Supervisory And Organizational Structure Factors, *Academy Of Marketing Science*, 21 (Summer): 179-193.

Reichers, A. E. (1985), A Review And Re Conceptualization Of Organizational Commitment, *Academy of Management Review*, 10: 456-476.

Steers, R. M. (1977), Antecedents and Outcomes of Organizational Commitment, *Administrative Science*, 22(Quarterly): 46-56.

Sims, H.P., Szilagyi, A.D. & Keller, R.T. (1976), The Measurement Of Job Characteristics. *Academy of Management Journal*, 19, (2): 195-212.

Suliman, A.M. & iles, P.A. (2000), The Multidimensional Nature Of Organizational Commitment In A Nonwestern Context, *Journal Of Management Development*, 19 (1): 71-83.

Wilson, P.A. (1995), The Effects Of Politics And Power On The Organizational Commitment Of Federal Executives, *Journal Of Management*, 21: 102-118.

Economic Impact on the Malaysian Economy Due to an Increase of World Crude Oil Price: An Input-Output Analysis

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ABSTRACT

The economic prosperity of the 20th Century was driven by cheap, oil-based energy. However, the global crude oil prices keep rising for the past few years especially since late last year or early this year, which could cause a turning point for mankind. These were due to the war with Iraq, the violence in Nigeria and the strikes of oil workers in Venezuela, which have reduced crude oil production. These have increased the crude oil price. Hopping that we are not facing a re-run of oil shocks of the 1970s. The crude oil price is seems not a temporary but the onset of a permanent new condition. The warning signals have been flying for quite sometime. On average the crude oil price has increased from US$25.26 (RM95.99) per barrel in 2003 to US$52.00 (RM197.60) per barrel in mid October 2004, from US$33.05 in January. The high price of oil is unlikely to trigger a worldwide recession. Malaysia is not being exempted from the problem of crude oil price increase. This paper would like to investigate the economic impact to the Malaysian economy resulting from an increase of crude oil price. Using the inter-industry input-output model, the analysis should be able to present the empirical results for the economic impact on the Malaysian economy.

INTRODUCTION

Malaysia is important to world energy markets because its 3.0 billion barrels oil reserve and its 75 trillion cubic feet of natural gas reserves. Its oil and gas may account about 0.3 per cent of the world production and its oil reserves ranked 27th in the world (Department of Environment Malaysia, 2003 and The Star, 2004). Malaysian oil reserves has declined from 4.3 billion barrels 1996 to 3.0 billion 2003 and under the current production 600,000 barrels per day, the reserve are expected to last for 14 years. As a result of declining oil reserves, the Malaysian oil company has embarked on an international exploration and production strategy. However its crude oil production has been relatively stable in recent years from 1996 to 2003 (Sidek, 2004).

BACKGROUND

Malaysia has experienced three decades of sound economic growth and development. The 1960s and 1970s witnessed an easier phase of growth based on low labour cost and strong public sector support. Nevertheless, in the 1980s Malaysia experienced a setback in the economy due to external shock when commodity prices collapsed twice, in 1980 and again in 1985 (Bureau of National Economic Policy Studies, 1994). The economic growth thereafter was not remarkable, though some recovery took place in 1987. This was the time when the manufacturing sector for intermediate goods started its expansion and to lead in the Malaysian economy. This established a new structural change from merely producing primary commodities to basic manufacturing and advanced manufacturing including electric semiconductors and components of electric products. In the middle of 1997, the Malaysian economy had to face another economic disaster in the financial crisis that began in Thailand and later spread on all ASEAN countries including Malaysia. In fact the exchange rate badly affected most of the ASEAN countries. Due to this reason these ASEAN countries had no other choice but to liquidate their current assets in order to offset their losses resulting from the currency devaluation.

Malaysia's economy has resumed growth in 2002 and 2003, following a stall in 2001, which was due to reduced demand for Malaysia exports. Following growth of only 0.3 per cent decline in real gross domestic products (GDP) in 2001, Malaysia experienced real GDP growth of 4.4 per cent in 2003. Malaysia's merchandise trade surplus has risen sharply in 2003, after having fallen in 2001 and 2002 (EIA, 2004). Despite of this export surplus trend, the crude oil price has also kept on increasing since late 2003. The world crude oil price has increased from US$25.26 (RM95.99) per barrel in 2003 to US$52.00 (RM197.60) per barrel in mid-October 2004, from US$33.05 in January. According Gibson (2004) the world oil price might reach US$80.00 (RM304.00) per barrel at the end of

2004. These were due to the war with Iraq, the violence in Nigeria and the strikes of oil workers in Venezuela and in fact US oil production has also decreased by 2 percent per year, which have reduced crude oil production. While the world oil demand is growing rapidly in China, India and other developing nation. It is most likely that, much of the reaction to the oil price increase at the end of the decade was permanent and would not respond to lower prices with increased demand for oil.

Even though Malaysia is one of the oil producing countries but quantity produced is very small. The problem of crude oil price has also affected Malaysian economy. On first October 2004, the government has announced an increase of the petrol retail price by 5 cent per litter as well as the liquid petroleum gas (LPG) by 5 cent per kg as a result from the world crude oil price has increased to US\$47.78 (RM181.57) per barrel (The Star, 2004). The Second Minister of Finance Malaysia had informed the public that the higher crude oil prices had actually increased the Government's subsidy on petrol sold at retail level. He has claimed that The Malaysian Government is expected to pay to RM9.9billion in subsidies if the crude oil reached US\$60/barrel (The Star, 2004).

If the oil price continues to go up there will be a danger to the global economy which it will result recession. The energy cost could push global growth lower on the future. These are because energy could cause higher air fairs, higher costs for all companies, higher retail prices as costs are pass on to the consumers, the consumers spending fall and it might possibly lending to job losses. This study would like to examine the total economic impact on the Malaysian economy as a result of an increase on the crude oil price using closed input-output analysis.

THE OBJECTIVE OF THE STUDY

The general objective of this study is to investigate the effect of crude oil price on the Malaysian economy. The specific objectives of the study are as follows:

1.   To estimate the economic impacts on the Malaysian economy due to an increase of crude oil price.
2.   To study the policy options that could improve the Malaysian economy.

The findings of this study should be able to provide valuable information for the policy makers about the total economic impact on total output for the Malaysian economy. However, this study is only looking at crude oil but the refined petroleum is not included in the study.

DATA SOURCES

The data for this analysis are complied from published sources: Malaysian Economic Reports for various years, Quarterly Economic Bulletin and OPEC Annual Statistical Bulletin for various years. All variables are annually from 1960 to 1999 and expressed in Ringgit Malaysia and barrel for value and quantity respectively.

This study also used the input-output coefficients from the latest available 92-sector input-output table 1991 of Malaysia published by Department of Statistics Malaysia (2002). Since the Malaysian Input-output table is available for year 1991, the data for salaries, wages and profits and employment were collected for the same year. However, problems were encountered in collecting the data on profits for most of the sectors in Malaysia. Due to this reason this study has used the data from 338 companies under Permodalan National Berhad (1992) and the data from Golden Hope Plantation Berhad (1992) to estimate the percentage of profits from their total output. On average their profit was estimated at about 17.07per cent from the total output. Therefore the author has used this percentage to calculate the profit for each sector against the total output in the Malaysian Input-Output Table 1991. These figures plus the salaries and wages data from the Department Statistics Malaysia were used in the salaries, wages & profits row for income multiplier calculation.

METHODOLOGY OF THE STUDY

This study employed econometric and input-output analysis. The purpose of employing econometric analysis under this study is to forecast the quantity and price of crude oil export and import for Malaysia. The values of import and export were estimated and used to change the final demand in the input-output analysis.

i) Econometric

In this econometric analysis, we employed log-linear or constant elasticity model to measure elasticity of price of crude oil based on ordinary least square (OLS). The slope coefficient will measure the elasticity of value and quantity of exports and imports with respect to price of crude oil. For the estimating purposes, we can write the general model as:

$$\text{Log } Y_i = B_1 + B_2 \log P - \text{Log } Y_{i-1} + D$$

Where, Y_i are quantity of imports and exports of crude oil; P are price of export and import crude oil and D is dummy variables.

These applications presume the time series involved to be stationary. Stationary is defined as the tendency of a variable to return to its original value following a distribution. A time series is said to be stationary if the variable moments (e.g. its means and variance) are constant over times. When is a requirement for many statistical tests such as classical t-test and F-test. When the time series are non-stationary then the estimated coefficients are likely to be inconsistent.

ii) The General Concept of the Input-Output Model

Generally, the input-output model is concerned with the interdependence or interindustry relationships between producing and consuming sectors in the economy. It is assumed that the economy can be divided into sectors that produce goods and services. Apart from the sectors of the economic system producing goods and services, there is a household sector, which supplies factor services and demands private consumer goods, a government sector, which demands public consumer goods, and a foreign trade sector, which demands exports and supplies imports. The demand of these additional sectors may be added together to form the sector's final demand. The output from any industry may be used by that sector itself or sold to other sectors to be used as input to the production process or sold to meet final demand. However this study has included the household sector in the processing block, thus this study is a close input-output analysis.

The basic relationship in the input-output model can be simplified as follows. The following notation is used:

$$X_i = \text{Total output of sector } j$$

$$X_{ij} = \text{Output in sector } i \text{ used in sector } j$$

$$Y_i = \text{Total final demand for sector } i's \text{ product}$$

If there are n sectors, the following is true for each of them:

$$X_i = \sum_{j=1}^{n} X_{ij} + Y_i \qquad _i = 1\ldots\text{n} \tag{1}$$

If all the sectors are arranged accordingly, they could be interpreted as an accounting identity. Under equilibrium conditions, the quantity of output supplied equals the quantity of output demanded. In this form the demand of any sector's input is proportionate to the demanding sector's output or sector *j's* demand for the output of sector *i* is proportionate to the total output of industry *j*. It could then be written as follows:

$$X_{ij} = a_{ij} X_j \tag{2}$$

where $a_{ij} =$ Coefficient of proportionality or input-output coefficient.

This coefficient value could be zero if sector j does not consume any input from other sector *i*. This value must be positive and lie between one and zero.
Substituting (2) into (1), we obtain,

$$X_{ij} = \sum_{j=1}^{n} a_{ij} X_j + Y \qquad _i = 1 - \text{n} \tag{3}$$

Based on the above series of equations (3), in the first equation we see that X_1 is multiplied by unity and $-a_{11}$, while in the second equation X_2 is multiplied by unity and $-a_{22}$, and so on. Therefore we can rewrite the equations in the matrix form for clarity.

$$\begin{pmatrix} 1 & -a_{11} & -a_{12} & ..... & -a_{1n} \\ & -a_{21} & 1-a_{22} & ..... & -a_{2n} \\ & ..... & ..... & ..... & ..... \\ & -a_{n1} & -a_{n2} & ..... & 1-a_{nn} \end{pmatrix} \text{ x } \begin{pmatrix} X_1 \\ X_2 \\ ..... \\ X_n \end{pmatrix} = \begin{pmatrix} Y_1 \\ Y_2 \\ ..... \\ Y_m \end{pmatrix} \tag{4}$$

If A is defined as the input-output coefficient then we can rewrite (4) as follows:

$$A = \begin{pmatrix} a_{11} & a_{12} & ..... & a_{1n} \\ a_{21} & a_{22} & ..... & a_{2n} \\ ..... & ..... & ..... & ..... \\ a_{n1} & a_{n2} & ..... & a_{nn} \end{pmatrix} \tag{5}$$

From equation (5), the multiplication of a matrix on the left-hand side of the equation is equal to the identity matrix minus the matrix of input-output coefficient. This product is multiplied by the output nx1 matrix (or column vector); it can be denoted as X which is equal to the final demand nx1 matrix (or column vector) called Y. The input-output system can then be rewritten as follows.

$$(I - A)_{nxn} X_{nx1} = Y_{nx1} \tag{6}$$

If (6) is multiplied on both sides by the inverse matrix we get:

$$(I - A)^{-1}(I - A)X = (I - A)^{-1}Y \tag{7}$$

Since $\quad (I - A)^{-1}(I - A) = I$

$$IX = (I - A)^{-1}Y \tag{8}$$

$$X = (I - A)^{-1}Y \tag{9}$$

Equation (9) holds on the condition that matrix $(I - A)$ has an inverse matrix. This condition will be met if the Y vector has at least one non-zero element (Richardson, 1972). The matrix $(I - A)$ is also known as *Leontief matrix*. The concept in equation (9) will be used to calculate the economic impact analysis for this study. Knowing that X is the total output that is equal to the inverse matrix multiplied by the final demand Y. Any change in the final demand, when multiplied by the inverse matrix will change the total output, as described by Khamuruddin (1998). In this study the inverse matrix will be adopted from the Input-output Malaysia 1991 produced by the Department of Statistics, Malaysia.

An increase in crude oil price will increase the export and import volume of crude oil for Malaysia. The econometric analysis in part one will be used to calculate the export and import values of crude oil. The net export values will be used to calculate the final demand in the 1991 Malaysian I-O matrix. There are 92 commodities available in the Malaysian economy I-O table and crude petrol, natural gas & coal are in the 9nd sector. The 92 commodities in the Input-output table of the Malaysian economy are described in Appendix 1 while the transactions for those commodities in the whole economy are contained in Table 6 in Input-output Malaysia 1991 page 37. However this study has reduced the Malaysian I-O matrix to 77 sectors only and crude oil, natural gas & coal sector are remained in the 9th sector in the current matrix. If we assume the current final demand for export value to be Y (export value with current crude oil price) and Y^* (new net export value with new crude oil price) we can multiply the inverse matrix with these final demand values, yielding the potential contribution of those changes to the sectoral output can be shown as;

The first calculation, the total output with the current crude oil price is:

$$X = (I - A)^{-1} Y \tag{10}$$

where

Y = the final demand export of current crude oil price

$(I - A)^{-1}$ = Inverse matrix

X = Total output current crude oil price

Second and subsequence calculation, the total output with new crude oil price is equal to:

$$X^* = (I - A)^{-1} Y^* \tag{11}$$

where:

Y^* = the final demand with change in the net export of new crude oil price

$(I - A)^{-1}$ = Inverse matrix

X^* = Total output due to changes in net export at new crude oil price

This analysis is expected to portray a complete economic impact study because input-output analysis views the economy in a holistic manner (O'Connor and Henry, 1975). The total output for both calculations could be analysed individually or by comparison with current and new crude oil prices to see the impact on the economy due to an increase in crude oil price.

Next, the input-output allow us to estimate revenue collected by government in terms of direct and indirect taxes due to changes in sectoral output. The potential contribution of changes in net export of crude oil to indirect taxes for sector i can be calculated by the following expression.

$$T = t (Y^* b_i), \qquad i = 1, 2, 3, \ldots, 77$$

Where T is the total indirect taxes collected, t is the column vector whose elements are δ and λ which represent domestic and import commodities taxes coefficients respectively, after transposing their row vectors. While, b is the element in the Leontief inverse matrix can be interpreted as the indirect taxes partial multiplier. However, direct taxes we obtained from multiplying value of export crude oil by 10% ad valorem tax as gazetted by Ministry of Finance (2004).

Nevertheless this study would like to calculate the total economic impact resulting from an increase in crude oil price, which could cause a change of Malaysian Crude oil export value. The export values were computed from the econometric analysis in the earlier part of the study. The econometrics was run several times according the forecasted crude oil price for a different scenario under consideration.

ANALYSIS OF RESULTS

i) Econometric

a) Unit Root Test

The time series data have been analysed with econometric method. In order to ensure the estimations were valid for forecasting the unit root tests have been tested.

The determination of the order of integration of a series is necessary procedure that precedes the analysis of long run relationship among variables. The Dickey-Fuller (DF) test and/or Augmented Dickey-Fuller (ADF) test are applied to the data in level and in first differences. The result of the unit root test on the level and its first difference of the series are given in Table 1. In all the cases for the unit root tests on the level and first difference, the absolute value of test statistics are greater than the absolute critical value of McKinnon suggesting that null hypothesis of unit root can be rejected and all the series are stationary.

Table 1: Results of Unit Root Tests

Variables	Augmented Dickey-Fuller (ADF)	
	Level	First Difference
Exports (quantity)	-1.4725***	-4.2828***
Imports (quantity)	-1.6882***	-4.2814***
Price	-1.4725***	-4.2828***

Notes: i) Sample period of the table is annually data from 1960-1999
    ii) *** denote 1%, ** denote 5% and * denote 10% levels of significant.
    These levels are McKonon critical values for rejection of null
    Hypothesis of a unit root with max lags=4

b) Estimation of the Equations

One attractive feature of the log-liner is that, the model that has made it popular in empirical work whereby the slope coefficient B_2 measures the elasticity of LXQ with respect to LPRM, that is, the percentage change in LXQ for a given (small) percentage change in LPRM. The log-linear regression can be easily estimated with the usual ordinary least square (OLS). The results of the OLS regression based on log-linear model for Malaysian export and import of crude oil are given in the table 2 and 3 respectively.

The equation of Malaysian export of crude oil as in Table 2, except constant other estimated coefficients are statistically significant at the 1 per cent level of significance, while the Malaysian import of crude oil equation (Table 3) has indicated that quantity of last year import is statistically significant at the 1 per cent, dummy variable is statistically significant at 5 per cent and constant is statistically significant at 10 per cent. These coefficient suggesting that if the price of crude petroleum increases by 1 percent, the quantity of exports demanded on the average increases by 0.167268 per cent whereas imports volume will decrease by 0.086335 per cent. Therefore the demand for quantity of exports and import is inelastic. Based on these estimations the final demand can be estimated as in Table 4.

Table 2: Malaysian Export of Crude Oil

Dependent Variable: LXQ
Sample (adjusted): 1971 1999
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.311831	0.597696	0.521721	0.6065
LPRM	0.167268***	0.053543	3.123960	0.0045
DX2	0.610439***	0.125992	4.845051	0.0001
LXQ(-1)	0.917649***	0.058386	15.71699	0.0000
R-squared	0.944481	F-statistic	141.7648	
Adjusted R-squared	0.937818	Prob (F-statistic)	0.000000	
Durbin-Watson stat	2.143963			

Notes: Level of significance: ***=1%;** = 5%; *=10%
    The dummy variable used 1 for 1971 and 1976.

Table 3: Malaysian Import of Crude Oil

Dependent Variable: LIQ
Sample (adjusted): 1971 1999
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.396059*	1.197654	2.000627	0.0564
LPUSD	-0.086335	0.090615	-0.952761	0.3498
DI1	0.423654**	0.167496	2.529347	0.0181
LIQ(-1)	0.771194***	0.110982	6.948809	0.0000
R-squared	0.737252	F-statistic	23.38276	
Adjusted R-squared	0.705722	Prob(F-statistic)	0.000000	
Durbin-Watson stat	1.910267			

Notes: Level of significance: ***=1%;** = 5%; *=10%
    The dummy variables used 1 for 1971, 1980, 1989 and 1999.

c) Estimation of Export and Import of Malaysian Crude Oil

Table 4 depicts the forecasted values for world crude oil prices (US$ and RM), export and import. The world crude oil in US$ in column 1 is equivalent to RM in column 2. The figures in column 3 are the percentage changed on crude oil price. The figures in column 4 and 7 are elasticity's for export and import of crude oil price respectively. The values in column 5 are the forecasted values of Malaysian crude oil export except the value in the first row are average figures for 2003. The Value in column 6 is actually the different of export value resulting from a change on price accordingly. The same procedure is being used for computing column 8 and 9 for import crude oil value. Column 10 is actually portraying the value of net export of Malaysian crude oil.

Table 4: Estimated Value of Malaysian Export and Import Due an Increase in World Crude Oil Price

Crude Oil Price			Export			Import			Net
US$/ barrel	RM/ barrel	% change in price	Export Price Elasticity	Export values (RM'000) (3)x(4)x(#)	Changes in export (RM'000)	Import Price Elasticity	Import values (RM'000) (3)x(4)x(@)	Changes in import (RM'000)	Net Export (RM'000)
1	2	3	4	5	6	7	8	9	10
25.26*	95.99	-	0.167268	15,661,723.00 #	-	-0.086335	6,305,293.00@	0	9,356,430.00
33.05	125.59	30.84	0.167268	16,469,620.96	807,897.96	-0.086335	6,137,414.04	-167,878.96	10,332,206.93
52.00	197.60	105.86	0.167268	18,434,918.33	2,773,195.33	-0.086335	5,729,030.68	-576,262.32	12,705,887.64
60.00	228.00	137.53	0.167268	19,264,595.31	3,602,872.31	-0.086335	5,556,626.10	-748,666.90	13,707,969.21
70.00	266.00	177.12	0.167268	20,301,691.54	4,639,968.54	-0.086335	5,341,120.37	-964,172.63	14,960,571.17
80.00	304.00	217.71	0.167268	21,338,787.78	5,677,064.78	-0.086335	5,125,614.64	-1,179,678.36	16,213,173.14

Note: The values of first row for column (5) and (6) are from Malaysian Input-out Table 1991; US$1.00=RM3.80, * = the average crude oil price 2003
Sources: Equation from Table 2 and 3.

Based from Table 4, it is very clear that the forecasted value for Malaysian crude oil export are expected to increase when the world crude oil price increase. Based on the record, the average value of Malaysian crude oil export in 2003 is RM15.66billion at the level of average world crude oil price US$25.26 per barrel. Malaysia is also importing crude oil but much less than the total export, which is about RM6.30billion for the same year. It implies that, Malaysia is a net export of crude oil to the rest of the world. The main reason for this is that, Malaysia crude oil is a premium quality and manages to fetch a good price (Zakariah and Mohd Shahwahid, 1994).

The most interesting preliminary finding from econometrics analysis is that, as the world crude oil price increases the value of Malaysian crude oil export is also keep on increasing. Table 4 has shown that the value of Malaysian export for crude oil has increased from RM15.66 billion at the crude oil price US$25.26/barrel to RM21.34billion when the crude oil price increase to US$80.00/barrel. However, there is a reverse for the value of Malaysia import of crude oil whereby the import value for crude oil is kept on decreasing. The import value for crude oil import has decreased from RM6.30 billion at the crude oil price US$25.26/barreal to RM5.2billion when the crude oil price increase to US$80.00/barrel, which is in line with Gibson (2004) estimate.

The changed in the Malaysian crude oil export value is much larger as compared with the value of Malaysian crude oil import. Malaysia is expected to increase export crude oil to RM807.8 million when the crude oil price US$33.05/barrel while the value of Malaysian import of crude oil is only RM167.8 million but its export has increased to RM5.6billion when the crude oil price reached RM80/barrel.

ii) Input-output Analysis

a) Total Output

Based from the econometric output computed in the first section, the value of net export crude oil has been used in the input-output analysis for economic impact study. There were six-run of input-output analysis have been carried out; the first analysis has been used actual data (average) 2003 and followed by difference levels of crude oil prices for the rest of the column (Table 5).

Table 5: The Effect of an Increase of world Crude Oil Price on Sectoral Output

Sectors	Output at Difference Price Level (RM'000)					
	US$25.26 (RM95.99)/ Barrel#	UD$33.05 (RM125.59) / Barrel	US$52 (RM197.6) / Barrel	US$60 (RM228)/ Barrel	US$70 (RM266)/ Barrel	US$80 (RM304) / Barrel
Crude petrol, natural gas & coal.	9,517,388.67	10,509,951.88	12,924,467.03	13,943,787.41	15,217,937.88	16,492,088.35
Transport and communication (71&72)	287,457.60	317,436.39	390,362.99	421,149.94	459,633.63	498,117.32
Business services.	246,214.46	271,892.03	334,355.43	360,725.21	393,687.43	426,649.65
Wholesale & retail trade.	210,416.75	232,361.00	285,742.71	308,278.52	336,448.29	364,618.05
Industrial machinery.	142,928.82	157,834.79	194,095.14	209,402.94	228,537.69	247,672.43
Hotels & restaurants.	127,668.49	140,982.96	173,371.84	187,045.24	204,136.99	221,228.75
Real estate.	104,230.63	115,100.79	141,543.59	152,706.78	166,660.76	180,614.75
Ownership of dwellings.	99,982.81	110,409.96	135,775.12	146,483.36	159,868.66	173,253.97
Motor vehicles, cycles & other transports (61,62&63)	79,220.89	87,482.80	107,580.75	116,065.38	126,671.16	137,276.94
Petrol & coal products.	66,954.61	73,937.27	90,923.33	98,094.23	107,057.85	116,021.47
Insurance.	64,456.45	71,178.57	87,530.86	94,434.20	103,063.37	111,692.55
Agricultural product other.	56,241.50	62,106.90	76,375.09	82,398.60	89,927.99	97,457.38
Electricity & gas.	54,342.15	60,009.46	73,795.80	79,615.89	86,891.00	94,166.11
Rubber and plastic products (43,44&45)	52,798.33	58,304.64	71,699.32	77,354.07	84,422.50	91,490.94
Livestock etc.	48,747.00	53,830.80	66,197.67	71,418.52	77,944.58	84,470.63
Electrical appliances (57,58&59)	41,215.07	45,513.37	55,969.44	60,383.60	65,901.32	71,419.03
Oils and fats.	41,205.72	45,503.04	55,956.73	60,369.90	65,886.36	71,402.81
Fish etc.	32,644.58	36,049.07	44,330.84	47,827.10	52,197.43	56,567.76
Buildings & construction.	32,363.89	35,739.10	43,949.67	47,415.87	51,748.62	56,081.37
Recreation.	30,324.19	33,486.68	41,179.78	44,427.53	48,487.21	52,546.89
Grain mill products.	24,205.08	26,729.42	32,870.13	35,462.52	38,703.00	41,943.48
Iron, steel & non-metal products (49,50&51)	21,650.78	23,908.73	29,401.42	31,720.24	34,618.76	37,517.28
Meat & meat products.	21,145.53	23,350.79	28,715.31	30,980.01	33,810.89	36,641.77
Repair motor and other vehicles (85&86)	19,639.15	21,687.30	26,669.66	28,773.03	31,402.24	34,031.45
Confectionary and bakery products (18&19)	19,133.90	21,129.36	25,983.54	28,032.80	30,594.37	33,155.94
Animal feeds.	18,179.54	20,075.48	24,687.54	26,634.58	29,068.39	31,502.20
Tobacco.	17,954.99	19,827.51	24,382.60	26,305.59	28,709.34	31,113.08
Printed products.	17,852.07	19,713.85	24,242.83	26,154.81	28,544.77	30,934.73
Other foods.	17,346.82	19,155.91	23,556.72	25,414.57	27,736.90	30,059.22
Wine, spirit, bear & soft drinks (23&24)	17,159.69	18,949.27	23,302.60	25,140.42	27,437.69	29,734.96
Industrial chemicals.	16,981.92	18,752.96	23,061.19	24,879.96	27,153.44	29,426.91
Health.	16,822.86	18,577.31	22,845.19	24,646.93	26,899.11	29,151.29
Paper & board.	16,486.03	18,205.35	22,387.77	24,153.44	26,360.53	28,567.61
Yarn, cloth and textiles (26,27&28)	15,803.01	17,451.10	21,460.24	23,152.76	25,268.40	27,384.05
Wearing apparel.	15,148.06	16,727.84	20,570.83	22,193.20	24,221.16	26,249.13
Others	208,227.35	229,943.27	282,769.53	305,070.85	332,947.51	360,824.17
Salaries and wages	2,347,200.81	2,591,989.09	3,187,462.50	3,438,849.70	3,753,083.69	4,067,317.68
TOTAL	14,167,740.22	15,645,286.04	19,239,572.72	20,756,949.68	22,653,670.89	24,550,392.09

Note: # Average of crude oil price 2003.

Table 5 depicts the result of economic impact on the sectoral output as result an increase of world crude oil price. It has been found that, the total output generated in 2003 was about RM14.16billion with the average crude oil price US$25.26/barrel (RM95.99/barrel). Despite of an increase in crude oil price to US$33.05/barrel (RM125.59/barrel) in January 2004, but the total output has also increased to RM15.64billion and this crude oil price is keep on increasing over time. In the middle of October 2004, the price of crude oil has reached US$52/barrel (RM197.60/barrel), which it has increased the total output to RM19.24billion. In fact the analysis has found out that, the total output has increased to RM24.55billion if the world crude oil price reached US$80/barrel (RM304/barrel).

The crude petrol, natural gas & coal sector is the highest impact on the total output, if the crude oil increased in the world market. At the level of world crude oil price US$25.26/barrel (RM95.99/barrel), it has generated the total output about RM9.52billion which is about 67.1 per cent of the total increase on the total output. Transport and communication sector is the second highest economic impact on the output. This sector has managed to generate output for the country RM287.5million followed by Business services sector RM246.3million, Wholesale & retail sector RM210.4million, Industrial machinery sector RM142.9million, Hotel and restaurants RM127.7million, Real estate sector RM104.2million, Ownership of dwelling RM100million and the rest of the sectors have generated less than RM100million except Salaries and wages (Household) sector has generated about RM2.35billion of output through consumption which is about 16.5 per cent of the total output generated.

In the actual fact, all sectors have a positive effect on the total output, the main reason for this because Malaysia is a net exporter of crude oil. Table 5 has also depicted the effect on the total output for several difference levels of crude oil price such as US$33.05, US$52, US$60, US$70 and UD$80 per barrel. Since input-output is a linear in nature than the total outputs for all the sectors have increased linearly according to the level of crude oil price. According to Gibson (2004), the crude oil price is expected to reach US$80/barrel by the end 2004, if it is true the input-output analysis has forecasted that the Malaysian total output is expected to increase to RM24.55billion from RM14.17billion last year (2003) with the average crude oil price US$25.26/barrel. Based on these forecasted total output would be generated due to an increase on the crude oil price, the government revenue could be estimated through tax collection.

b) Government Revenue Due to Increase Crude Oil Price

i) Indirect Tax[1]

An increase on the crude oil price is expected to increase the total output to the Malaysian economy. The Government could collect direct and indirect tax on the total output generated resulting from an increase of crude oil. Using input-output analysis, the indirect tax could be calculated on the domestic and import commodities tax.

The result of analysis has found that if the crude oil price is at US$25.26/barrel, about RM110million for domestic commodities and RM88million for import commodities tax could be collected and if we added together the total of indirect tax collected is about RM199million. The amount of indirect tax is expected to increase too, if the crude oil price increases due to linearity identity. If the crude oil is expected to increase to US$80/barrel then the indirect tax could be collected about RM191million from domestic commodities tax and RM153million from import commodities tax and made up to a total of RM344million, which is an increase of 173 per cent from 2003 (Table 6).

Table 6: Revenue collected from direct and indirect taxes due to increase in output

Crude Oil Price (US$/ barrel)	Crude Oil Price (RM/ barrel)	Indirect Tax (RM)			Direct Tax (RM)	Total (RM)
		Domestic commodities taxes#	Import commodities taxes#	Sub-total		
1	2	3	4	5	6	7
25.26	95.99	110,254.21	88,518.11	198,772.32	935,643.00	1,134,415.32
33.05	125.59	121,752.56	97,749.62	219,502.18	1,033,220.69	1,252,722.87
52	197.6	149,723.52	120,206.23	269,929.75	1,270,588.76	1,540,518.51
60	228	161,531.83	129,686.60	291,218.43	1,370,796.92	1,662,015.35
70	266	176,292.23	141,537.05	317,829.28	1,496,057.12	1,813,886.41
80	304	191,052.63	153,387.51	344,440.14	1,621,317.31	1,965,757.46

Note: # Computed using input-output coefficient 1991

ii) Direct Tax

Direct tax in this analysis is referring to the tax being collected by the government based on the gazetted value of crude oil, which is 10 per cent ad valorem (Kementerian Kewangan (2004). Using the result of econometric

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[1] Indirect tax is the money collected by the government on the expenditure or a tax on goods, which is ultimately paid, in the form of price increase by the consumer.

analysis in Table 4, the direct tax on crude oil export has been calculated as in Table 6 in column 6. If the crude oil price US$25.26/barrel then the Government is expected to collect direct tax about RM936million and the amount of direct tax is also keep on increasing as the price of crude oil increases. If the crude oil price increases to US$80/barrel then the amount of direct tax is expected to collect about RM1.621million.

iii) Government Revenue (Indirect and Direct Tax)

An increase of crude oil price has increase on the total output in the Malaysian economy, based on the output then the Government could collect direct and indirect tax on the output increased. The result of analysis has found out that, if the crude oil price at US$25.26/barrel then the total tax, which could be collected, estimated RM1.13billion. The Government revenue is expected to increase as the crude oil price increases in world market. If the crude oil price reached US$80/barrel the Government revenue is expected to increase RM1.9billion.

CONCLUSION AND POLICY IMPLICATION

The finding from this study has found out that Malaysia is a net crude oil exporter to the world. An increased of world crude oil price is an advantage to the Malaysia because it has increased on the total output to the Malaysian economy. The average total output generated in 2003 estimated about RM14billion at the crude oil price level US$25.26/barrel and if the crude oil price increased to US$80/barrel (RM304/barrel) then the total output for Malaysia is expected to increase to RM24billion. These output generated resulting from an increased on the crude oil price could be tax by the Government through indirect and direct tax. These taxes collected are actually the Government revenue. The Government has earned revenue through tax is 2003 about RM1.1billion and this amount is expected to increase to RM1.9billion if the crude oil price reached to US$80/barrel.

Despite of the fact that the Government is expected to increased revenue due to an increase of crude oil price but the Malaysian Government have to subsidize the imported refined petroleum for local consumption. According to The Star (2004), the Government is expected to loss RM9.93billion if the crude oil price reached US$60/barrel; however the expected revenue could be collected is only RM1.66billion. At this moment, it is very clear that the Government is required to subsidize the petrol retail price about RM8.27billion to maintain the current price level, if the crude oil price reached US$60/barrel. However, it is good to have several studies such as the effect of importing refined petroleum to the Malaysian economy; and the study on the effect of indirect tax to inflation resulting from an increase on the crude oil price. These are important in order to come up with a balance approached in formulating right policy to improve the wealth being. Indirect tax has a direct effect to the consumers' expenditure or a tax on good, which is ultimately paid in the form price increase pass to the consumers.

REFERENCES

Bureau of National Economic Policy Studies. (1994). *Malaysia's Economic Policies to the Year 2000*, in edited by Vijayakumarari Kanapathy & Ismail Muhd Salleh (1994). Malaysian Economy: Selected Issues and Policy Direction, ISIS Malaysia, Kuala Lumpur, p. 1-52

Department of Environment Malaysia (2003). Malaysia Country Analysis Briefs November 2003 on the Website http://www.eia.doe.gov/listserv_signup.html

Department of Statistics Malaysia, (2002). *Input-output Tables Malaysia*, Department of Statistics Malaysia, Kuala Lumpur.

EIA (2004). Malaysia Country Analysis Brief, Department of Environmental Malaysia in Website http://www.eia.doe.gov/ emeu/cabs/malaysia.html

Gibson D. (2004). Here's How You could Bank Three-Figure Gains As Brent Crude Hits $100 a Barrel on the website http://www.fsponline-recommeds.co.uk/page. aspx?

Golden Hope (1992). Financial Statement, Annual Report 1991, Golden Hope Plantation Berhad. Kuala Lumpur.

Kementerian Kewangan (2004). Summary of Tax System 2004 on websites http://www.treasuru.gov.my

Khamuruddin, M. N. (1998). *Role of Forestry in Regional Economic Development: Applications of Input-output Analysis in Sarawak Forestry Sector*. Paper Presented at Workshop on Forestry Economics and Policy: R&D Toward Achieving Sustainable Forest Management 10-11 November, 1998 organized by Universiti Putra Malaysia.

O'Connor, R. and Henry, E.W.(1975). *Input-output and Its Application*, Charles Griffin and Company Limited London.

Permodalan National Berhad (1992), Annual Report 1991, Permodalan National Berhad, Kuala Lumpur.

Richardson, H.W. (1972). *Input-Output Regional Economics*. Trowbridge, Wiltshire, Great Britain: Redwood Press Limited.

Sidek, K. (2004). Listed Oil and Gas Players Add Depth to Sector, Business The Star Online on Website http://www.thestar.com.my

The Star, (2004). Petrol Subsidies Soaring on October, 13 2004 on website http://thestar.com.my/news/story.asp?file=/2004/10/13/nation/9115934&sec=nation.

Zakariah, A.R. and Mohd Shahwahid, O (1994). Economic Impact of Oil Trade in a Developing Country: An Emprical Investigation of Consequences of Recent Gulf Crisis in Malaysia, *Jurnal Ekonomi Malaysia*, p 39-55.

Appendix 1: Description of Commodities in The Malaysian Economy 1991

Row/ column number	Malaysian I-O Table (92 sectors)	Row/ column number	Malaysian I-O Table (77 sectors)
1	Agriculture products and others	1	Agriculture products and others
2	Rubber primary products	2	Rubber primary products
3	Oil palm primary products	3	Oil palm products
4	Coconut	4	Coconut
5	Tea Estate	5	Tea Estate
6	Livestock etc	6	Livestock etc
7	Forestry & logging products	7	Forestry & logging products
8	Fishing etc	8	Fishing etc
9	Crude petrol, natural gas & coal	9	Crude petrol, natural gas & coal
10	Metal ore	10	Metal ore
11	Stone, clay & sand	11	Stone, clay & sand
12	Meat & meat products	12	Meat & meat products
13	Dairy products	13	Dairy products
14	Preserved of fruit & vegetable	14	Preserved of fruit & vegetable
15	Preserved of seafood	15	Preserved of seafood
16	Oil and fats	16	Oil and fats
17	Grain mills products	17	Grain mills products
18	Bakeries products	18	Bakeries and confectionary products
19	Confectionery		
20	Ice	19	Ice
21	Other foods	20	Other foods
22	Animal feeds	21	Animal feeds
23	Wine and spirits	22	Wine, spirit, bear & soft drinks
24	Beer, soft drinks		
25	Tobacco	23	Tobacco
26	Yarn, cloth		
27	Knitted fabrics	24	Yarn, cloth and textiles
28	Other textiles		
29	Wearing apparels	25	Wearing apparels
30	Leather industries	26	Leather and footwear
31	Footwear		
32	Sawmill products	27	Sawmill products
33	Other wooden products	28	Other wooden products
34	Furniture & fixtures	29	Furniture & fixtures
35	Paper & board	39	Paper & board
36	Printing products	31	Printing products
37	Industrial chemical	32	Industrial chemical
38	Paints and lacquers	33	Paints and lacquers
39	Drugs and medicines	34	Drugs and medicines
40	Soap & cleaning preparation	35	Soap & cleaning preparation
41	Other chemical products	36	Other chemical products

Appendix 1: Description of Commodities in The Malaysian Economy 1991 (continued)

Row/ column number	Malaysian I-O Table (92 sectors)	Row/ column number	Malaysian I-O Table (77 sectors)
42	Petrol and coal products	37	Petrol and coal products
43	Processed rubber		
44	Rubber products	38	Rubber and plastic products
45	Plastic products		
46	China and glass industries	39	China and glass industries
47	Clay products	40	Clay products
48	Cement, lime & plaster	41	Cement, lime & plaster
49	Other non-metallic products		
50	Iron and steel	42	Iron, steel & non-metal products
51	Non-ferrous metal		
52	Metal furniture and fixture	43	Metal furniture and fixture
53	Structural of metal products	44	Structural of metal products
54	Other metal products	45	Other metal products
55	Industrial machinery	46	Industrial machinery
56	Household machinery	47	Household machinery
57	Radio, TV & com. Equipments		
58	Electrical appliances & house ware	48	Electrical appliances
59	Other electric machinery		
60	Ship and boat	49	Ship and boat
61	Motor vehicles		
62	Cycles, motorcycles	50	Motor vehicles, cycles & other transportation
63	Other transport equipment		
64	Instrument & clocks	51	Instrument & clocks
65	Other products	52	Other products
66	Electricity and gas	53	Electricity and gas
67	Water	54	Water
68	Building & construction	55	Building & construction
69	Wholesale & retail trade	56	Wholesale & retail trade
70	Hotels & restaurants	57	Hotels & restaurants
71	Transport	58	Transport and communication
72	Communication		
73	Banking services	59	Banking services
74	Other financial services	60	Other financial services
75	Insurance	61	Insurance
76	Real estate	62	Real estate
77	Ownership of dwelling	63	Ownership of dwelling
78	Business services	64	Business services
79	Education	65	Education
80	Health	66	Health
81	Private non-profit services	67	Private non-profit services
82	Entertainment	68	Entertainment
83	Radio & TV	69	Radio & TV
84	Recreation	70	Recreation
85	Repair motor vehicles	71	Repair motor and other vehicles
86	Other repair		
87	Laundry & cleaning	72	Laundry & cleaning
88	Other private services	73	Other private services
89	Public administration	74	Public administration
90	Public order	75	Public order
91	Defense	76	Defense
92	Other public administration	77	Other public administration

Note: 92 sectors are from Malaysian I-O Table 1991 and 77 sectors are for this study.
Source: Jabatan Perangkaan Malaysia (2002)

Prospects of Palm Oil Import Demand in Middle East and North African (MENA) Countries

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ASTRACT

This paper examines the prospect of palm oil import demand in Middle East and North African (MENA) countries. It employs the time- series analysis techniques of cointegration and ECM to scrutinize the palm oil import demand in representative MENA countries. Based on the findings, an attempt is made to forecast the prospects of expanding palm oil market in the region. The long-run income elasticities obtained by estimating the models have been incorporated into a projection framework to project the palm oil import demand in the representative countries. The results of the study suggest the relative unimportant role of palm oil prices and the national income as determinants of palm oil demand across the ten countries. The prices of substitute oils in almost all countries have been found to play an important role in shaping the demand. Other factors such as high palm oil discount, the world petroleum prices boom in the 1970s, the anti-palm oil campaign, trade embargos on Libya and Iraq and exchange rate also proved to be important determining factors for shaping import demand for palm oil in some MENA countries. Finally, projections for palm oil import demand revealed that import demand is expected to increase in all the countries under consideration, with variations in the magnitude of expansion among them, indicating the good potentiality of this market for absorbing more palm oil.

INTRODUCTION

The MENA region has been a progressively important and rapidly developing market for palm oil among other vegetable oils due to its high dependence on its imports to fill its shortfalls in this commodity. This substantial factor coupled with the increasing complexity of the domestic and international vegetable oils market, impels policy makers and other market participants to find tools that will provide timely and intelligible answers for questions concerning the major determining factors affecting demand for palm oil in the MENA region, and to try to project the future demand for palm oil in the region so as to formulate long-term targets and strategies .This study therefore, attempts to analyse the palm oil import demand in representative MENA countries, namely Algeria, Egypt, Iran, Jordan, Libya, Morocco, Saudi Arabia, Sudan, Syria, and Turkey, over a period of time; and to exploit the results of this analysis to identify the prospects of expanding its market in the MENA region.

METHODOLOGY

Model Specification

There are some key points to be considered prior to building the model answering the questions to be elucidated by this study. First, as the commodity under consideration is not a close substitute for domestically traded goods the study will be conducted under the criterion of the imperfect substitute model. Second, since the imports in individual MENA region countries compose a small share of fats and oils trade (average trade share for individual MENA countries compose about 1% in term of imports and much less than that percentage for exports), each of them can be treated as a small country. Under the small country assumption, the supply prices of different fats and oils faced by these countries are assumed to be exogenous. As price takers, individual countries face highly elastic supply function for different oils including palm oil. Thus, a single equation model can be appropriate in this case. The determinants of palm oil import demand in country I(Q_i) were modelled with a common set of six explanatory variables. The main explanatory variables suggested by economic theory are income (I), palm oil price (P), and the price a substitute oil (P_{st}).

$Q_t = f\ (P_t,\ P_{st},\ I_t)$ or
$Q_t = \alpha_0 + \alpha_1\ P_t + \alpha_2\ P_{st} + \alpha_3 I + u_t$ (1)

where

Q_t = quantity of palm oil demanded at time t.

P_t = price of palm oil at time t

Ps_t = prices of some relevant palm oil substitutes at time t

I_t = Income level at importing country at time t (GDP for the importing country).

Other explanatory variables included in the initial model specifications are exchange and linear time trend as well as the influence of the anti-tropical oils campaign which is represented by a dummy denoted as D_h. A dummy variable was also included in the palm oil import demand model specified for Libya to take account of the trade embargo imposed by United Nations declared in November 1993. Since the impacts of this event were expected to appear in 1994, the dummy variable was thus given the value of zero before 1994 and the value of one thereafter which is denoted D_{94}. The imposition of economic sanctions on Iraq in August 1990, the onset of Gulf war in January 1991and the implementation of mechanism for an oil-for-food programme were expected to affect the demand for palm oil in Jordan as a result of the expansion in its market of fats and oils. Therefore, a dummy variable to capture the effect of this succession of incidents which is denoted $D_{91,}$ was included in the palm oil import demand function for Jordan. Another dummy variable was inserted in the palm oil import demand function for Saudi Arabia to take account of the increase in oil prices that resulted in an increase in oil revenue and subsequently, led to a sudden increase in imports (Doroodian et al., 1994). The dummy was denoted $D_{0.}$ Visual inspection of the plot of palm oil imports quantity by Turkey ($lnQ_{T)}$ suggests a break in this series around 1975 when the palm oil imports of Turkey jumped to more than 11thousand tonnes compared to only 28 tonnes in 1974. An explanation of this upsurge in imports might be found in the highest ever discount of palm oil price against sunflower oil price of 278, 319 and USD176 / ton in 1974, 1975 and 1976 respectively augmented the demand for palm oil. The plot of palm oil imports quantity by Egypt ($lnQ_{E)}$ suggests a break in this series around 1980 when the palm oil imports increased to about two thousand tonnes, compared to only 88 tonnes in 1979. Since its inauguration in 1979, the Palm Oil Research Institute of Malaysia (PORIM) has considered Egypt as a potential market for palm oil (Ahmed, 1983). Its imports had, in fact risen significantly in1980 which marked the beginning of a continuous growth in this direction that might has been the result of the market promotional effort by PORIM. A dummy variable was included in the model to capture the effect of the serious market promotion activities on the demand for palm oil there and was denoted $D_{80.}$ A dummy variable denoted $D_{81}$was also included to capture the effect of a sudden drop in vegetable oils production in Sudan in 1981, where the production of groundnut oil declined by 27%, followed by another decrease of 41% in 1982. Likewise, the production of sesame oil dropped by 13% in 1981 and by 62% in both the years 1981 and 1982. Since that date vegetable oils production has presumed a downward trend. The main reason was draught, which affected a vast part of Africa, including the oil seed growing areas in Sudan. The other reason was the deterioration of the overall performance of Sudan's economy which led to depreciation of its currency which in turn increased the production cost via higher import prices of production inputs. This factor also resulted in preventing the operation of many crushing mills. Palm oil imports in Sudan increased from 140 tonnes in 1980 to more than one thousand in 1981 and to about 12 thousand tonnes in 1982.

The insertion of a dummy variable to capture the previously mentioned effects results in the following representation:

$$Q_t = \alpha_0 + \alpha_1 P_t + \alpha_2 Ps_t + \alpha_3 I + \alpha_4 Ex_t + \alpha_5 T + \alpha_6 D_+ u_t \qquad (2)$$

The logarithmic form of equation (2) is:

$$ln\, Q = \beta_0 + \beta_1 lnPP + \beta_2 ln\, PS + \beta_3 lnI + \beta_4 lnEx + \beta_5 T + \beta_6 D + V \qquad (3)$$

where the time subscripts are suppressed for notational convenience. β_0 is constant and V is a multiplicative error term that is identically and independently distributed (i.i.d) with mean equal to unity and constant variance. In log-linear form the equivalent specifications (with the inclusion of a time trend) are:

$$lnQ_i = \beta_7 + \beta_8 lnPP_i + \beta_9 lnPS_i + \beta_{10} lnEx_i + \beta_{11} lnI_i + \beta_{12} T + \beta_{13} D_i + V_i \qquad (4)$$

Several different specifications of the general model were tried, and results from each model were tested for statistical significance of the estimated coefficients as well as for consistency with the cointegration method. After discarding the model specifications, that are neither cointegrated nor statistically significant, the following model specifications have been selected as the final models for individual countries:

Algeria
$$\text{In } QA = \beta_{12} + \beta_{13}\text{InPPA} + \beta_{14}\text{InSOPA} + \beta_{15}\text{In LNIA} + \beta_{16}D_h + \beta_{17}T + V. \tag{5}$$
Egypt
$$\text{lnQE} = \beta_{18} + \beta_{19}\text{InPPE} + \beta_{20}\text{lnSOPE} + \beta_{21}\text{lnIE} + \beta_{22}D_{80} + V. \tag{6}$$
Iran
$$\text{lnQR} = \beta_{23} + \beta_{24}\text{InPPR} + \beta_{25}\text{lnSOPR} + \beta_{26}\text{lnIR} + \beta_{27}D_h + V. \tag{7}$$
Jordan
$$\text{In } QJ = \beta_{28} + \beta_{29}\text{InPPJ} + \beta_{30}\text{In SOPJ} + \beta_{31}\text{In IJ}_t \beta_{32}D_{91} + V. \tag{8}$$
Libya
$$\text{lnQL} = \beta_{33} + \beta_{34}\text{LNPPL} + \beta_{35}\text{InCPL} + \beta_{36}\text{InEXL} + \beta_{37}\text{InIL} + \beta_{38}\text{InD}_{94} + V. \tag{9}$$
Morocco
$$\text{lnQM} = \beta_{39} + \beta_{40}\text{InPPM} + \beta_{41}\text{In SOPM} + \beta_{42}\text{InIM} + V. \tag{10}$$
Saudi Arabia
$$\text{InQSA} = \beta_{43} + \beta_{44}\text{InPPSA} + \beta_{45}\text{lnCPSA} + \beta_{46}\text{InISA} + \beta_{47}D_o + V. \tag{11}$$
Sudan
$$\text{InQSD} = \beta_{48} + \beta_{49}\text{InPPSD} + \beta_{50}\text{InRPSD} + \beta_{51}\text{lnISD} + \beta_{52}D_{81} + V. \tag{12}$$
Syria
$$\text{InQSY} = \beta_{53} + \beta_{54}\text{PPSY} + \beta_{55}\text{SNPSY} + \beta_{56}\text{nISY}_t + V. \tag{13}$$
Turkey
$$\text{In } Q_T = \beta_{57} + \beta_{58}\text{InPPT} + \beta_{59}\text{lnSOPT} + \beta_{61}\text{lnI}_t + \beta_{60}D_{75} + V. \tag{14}$$

where

QA	= Quantity of palm oil imports by Algeria in metric ton
PPA	= World market nominal prices of palm oil in USD/metric ton.
SOPA	= World market nominal prices of soybean oil in USD/metric ton.
IA	= Nominal GDP for Algeria (Billion Algerian Dinars).
QE	= Quantity of palm oil imports by Egypt in metric ton.
PPE	= World market nominal prices of palm oil in USD/metric ton.
SOPE	= World market nominal prices of soybean oil in USD/metric ton.
LNIE	= Nominal GDP for Egypt (Billion Egyptian pounds).
QR	= Quantity of palm oil imports by Iran in metric ton.
PPR	= Real per unit world export value of palm oil in USD/metric ton.
SOPR	= Real per unit world export value of soybean oil in USD/metric ton.
IR	= Real GDP for Iran (Billion Iranian Riyals).
QJ	= Quantity of palm oil imports by Jordan in metric ton.
PPJ	= World market nominal price of palm oil in Jordanian Dinars/metric ton.
SOPJ$_t$	= World market nominal prices of soybean oil in Jordanian Dinars/metric ton.
IJ	= Nominal GDP for Jordan (Million Jordanian Dinars).
QL	= Quantity of palm oil imports by Libya in metric ton.
PPL	= World market nominal prices of palm oil in USD/ metric ton.
CPL	= World market nominal prices of corn oil in USD/ metric ton.
EXL	= Nominal exchange rate for Libya (Libyan Dinars /USD).
LNIL	= Nominal GDP for Libya (Billion Libyan Dinars).
QM	= Quantity of palm oil imports by Morocco in metric ton.
PPM	= World market real price of palm oil in USD/ metric ton.
SOPM	= World market real price of soybean oil in USD / metric ton.
IM	= Real GDP for Morocco (Billion Moroccan Dirhams).
QSA	= Quantity of palm oil imports by Saudi Arabia in metric ton.
PPSA	= Nominal world market price of palm oil in USD / metric ton.
SOPSA	= Nominal world market price of corn oil in USD / metric ton.
ISA	= Nominal GDP for Saudi Arabia (Billion Saudi Riyals).
QSD	= Quantity of palm oil imports by Sudan in metric tonnes.
PPSD	= Import price of palm oil in Sudanese Dinars/ metric ton.
RPSD	= Import price of rapeseed oil in USD / metric ton.
ISD	= Nominal GDP for Sudan (Billion Sudanese Dinars).
QSY	= Quantity of palm oil imports by Syria in metric ton.
PPSY	= Nominal per unit value of palm oil imports in Syrian pounds /metric ton.
SNPSY	= Nominal per unit import value of sunflower oil in Syrian pounds / metric ton.
ISY	= Nominal GDP for Syria in Syrian pounds
QT	= Quantity of palm oil imports by Turkey in metric ton.
PPT	= Real world market price of palm oil in USD/ metric ton.
SOPT	= Real world market prices of soybean oil in USD / metric ton.

SNPT　= Real world market prices of sunflower oil in USD / metric ton.
IT　　= Real GDP for Turkey (Billion Turkish Liras).
V　　= Stochastic disturbance term that is identically and independently distributed.
D_h　= Dummy variable D_{90} = 0 for observations before 1990, D =1 from 1990 onwards.
D_O　= Dummy variable D_o = 0 for observations before 1976, D =1 from 1976 onwards.
D_{75}　= Dummy variable D_{75} = 0 for observations before 1975, D =1 from1975 onwards.
D_{80}　= Dummy variable D_8 = 0 for observations before 198, D =1 from 1980 onwards.
D_{81}　= Dummy variable D_{81} = 0 for observations before 1981, D =1 from 1981 onwards.
D_{91}　= Dummy variable D_{91} = 0 for observations before 1991, D =1 from 1991 onwards.
D_{94}　= Dummy variable D_{94} = 0 for observations before 1994, D =1 from1994 onwards.
T　　= Linear time trend variable.

Model Estimation Method

Co-integration and general-to-specific approaches are utilized to model the above mentioned relationships. First, the variables must be tested for stationarity, since regressions between non-stationary variables may be subject to the problem of spurious regression. An important exception is where the non-stationary variables are integrated of order one, or I(1), so that first-differencing makes them stationary. In this case there may be one or more cointegrating relationships between the I(1) variables, and the problem of spurious regression does not arise. In some cases, a difference stationary variable may also contain a deterministic trend, and this possibility must be considered in the cointegrating regression. Second, it is necessary to determine which of the explanatory variables in the general model should be included in the final cointegrating regressions. Third, given the existence of a cointegrating or long-run equilibrium relationship, it is always possible to build an error correction model (ECM) (Granger, 1983; Engle and Granger, 1987) to specify the nature of the short-run disequilibrium relationship between the variables. The literature on cointegration estimation (and the related problem of testing for unit roots) is very extensive, and a number of estimation methods have been recommended, including the Engle and Granger (1987) procedure, Johansen's (1996) full information maximum likelihood procedure, Philips and Hansen's(1990) fully modified OLS procedure and a relatively recent procedure known as the bounds testing (henceforth BT) procedure developed by Pesaran et al. (2001), have been proposed in the econometric literature for investigating the long-run equilibrium relationship among time-series variables. The Engle- Granger method has been criticized in the literature for several weaknesses which include the following (a) small sample bias due to the exclusion of the short-run dynamics, (b) the problem of normalization in systems with more than two variables and (c) the incapability to test hypotheses concerning the estimated coefficients in the long-run relationships. Although the procedures developed by Johansen and Philips and Hansen avert some of these problems, their procedures (along with the Engle-Granger method) entail that the variables included in the are integrated of order one i.e. the variables are I(1). On the other hand, the most important advantage of the BT procedure it is applicable irrespective whether the underlying variables are purely I(0), purely I(1) or fractionally integrated. [1]

Forecasting Method

In order to project palm oil import demand in each of the MENA countries in 2012, The FAO analysts projection methodology, illustrated in Ferris (1998) and utilised in the works of Web and Shamsuddin (2000), and Mohayidin and Samdin(2001); has been employed in this study as follows:

$$Q_{fit}=Q_{ib*}((1+POPGi+(IG_i*IEL_i)/(1+ELADJ)+T)^{NOYRS}) \tag{15}$$

where,

Q_{fit}　　= Projected import demand in country i in time t.
Q_{bit}　　= Import demand in country i in base year (2002).
POPGi　= Population growth in country i.
IG_i　　= Income growth in country i.
IEL_i　　= Income elasticity for palm oil in country i.

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[1] Detailed account of the relative advantages and disadvantages of these approaches are provided, *inter alia*, by Wickens and Breusch (1988), Inder (1993) and Banerjee et al. (1993). Detailed criticism on the relative power of diagnostic tests utilized to estimation models is included in McAleer (1994) and Gerrard and Godfrey (1998).

NOYRS   = Number of years between projection year and basic year.
ELADJ   = Downward adjustment in the income elasticity as incomes rise (= 0.2 in this study).
T   = Annual time trend factor.

The estimated income elasticities obtained by estimating the different long-run models has been incorporated into the above displayed projection framework based on income and population growth assumptions to the base year (2002). Projections have been based on the following scenarios: low growth, moderate growth and high growth rates of income calculated as follows: first, the assumed moderate income growth rate for each country equals the real income growth rate for the country of interest during the last five years of the study period (1998-2002).Second, the standard deviation of the annual income growth rate during the same period have been subtracted from, and added to the country's moderate income growth rates to obtain the assumed low and high income growth rates respectively for each country. The population growth rates are somewhat constant over a five to ten years period (Web and Shamsudin, 2000), thus the population growth rates in the base year, has been utilised. Since all the estimated models apart from the one specified for Algeria, do not embody time trend variable, the time trend has not been included in their import demand projections.

Data

Time range of data for different countries is as follows: for Iran, Saudi Arabia, Sudan and Syria 1968- 2002, for Jordan 1969-2002 and for Algeria, Libya, Morocco and Turkey 1970 –2002 and the time period for Egypt is1976-2002. Definitions of the variables are provided in appendix1.Annual data on palm, soybean, corn, rapeseed and sunflower seed oils prices were available from International Financial Statistics and as well as the Oil World Annual. Data on exchange rates and GDP were available from International Financial Statistics and database of the World Economic Outlook of the International Monetary Fund. FAOSTAT online database provided the data on quantities and value of different oils import by country. Oil World and FAOSTAT online databases provide aggregate data on other oils. Population growth rates are available from the Data Query of the World Bank.

RESULTS

Pre-estimation Tests

The augmented Dickey-Fuller (ADF) and the Philip Perron (PP) tests were used to determine the order of integration of the time series in all models and to check for the presence of deterministic time-trend in each regression. The findings of the conducted tests reveal that each of the specified models across the ten countries includes a mixture of I(0) and I(1) variables. With such a combination of I(1) and I(0) variables it was found that the appropriate procedure to analyse the long-run and the short-run behaviour of palm oil import demand by MENA countries was the BT. Besides, the results suggest the inclusion of time trend in all regressions except for Egypt. However, it was dropped from all the specifications during the general to specific applications for different reasons, except for Algeria. For instance, it was eliminated from the specifications of Syria, Morocco and Iran because its inclusion produces results that are economically irrational, and it was dropped from other specifications for being statistically insignificant and because its inclusion affects the performance of the error correction model.

Both SBC and AIC criteria for lag selection are used in this study to choose an appropriate lag order of the model specification before performing the test for the existence of co integrations. Thus, the models were estimated with a lag of one except for the model for Turkey which was estimated with a lag of two.

The BT was conducted on all models to investigate the presence of a long-run relationship among the variables specified for each country, employing the lag lengths previously selected. The error correction version of the ARDL model pertaining to the variables in equation (4) is as follows:

$$\Delta \ln Q_{it} = \gamma_0 + \gamma_1 T + \pi_{QQ} \ln Q_{t-1} + \pi_{Q,x} x_{t-1} + \sum_{i=1}^{\rho-1} \phi_i' \Delta z_{t-1} + \omega' \Delta x_t + u_t \qquad (16)$$

where x represents the regressors (InPP$_t$, In PS$_t$… etc), z represent all the variables used in the specified model. Table (1) summarises the results of the bounds test across the ten models. The conclusion drawn from those results is that the presence of a cointegrating relationship among the variables included in each of the ten models was established, which permits the application of the ARDL technique for the estimation of the parameters in the long-run relationship and the associated short-run dynamic error correction models.

Models Estimation

Table (2) shows the results based on the selected ARDL models along with the results of diagnostic tests, while the figures included in Appendix (2) display plots of cumulative sum (CUSUM) and cumulative sum of squares of recrusive residuals (CUSUMSQ). The equations for all countries have a high degree of explanatory power, and they are all free from misspecification errors and the plots of CUSUM and CUSUMSQ for examining the stability of the models are all within the critical bands, rejecting any evidence of parameter instability. Almost all the estimated coefficients are statistically significant and their signs are consistent with theory. Those findings suggest that the import demand function, used in this study, are properly specified and verified their stability throughout the sample period and accordingly estimations of the long-run and short-run dynamics based on those models are also reliable.

Estimating the Long -run Parameters

The findings of the Long –run model estimation displayed in Table (3) reveal that the palm oil price and the income variables emerged to be a significant determinant of palm oil demand across the ten models. Soybean oil proved to be an important substitute for palm oil in Algeria, Egypt, Iran, Jordan, Morocco and Turkey. The major substitute oil for palm oil in Saudi Arabia and Libya is corn oil, while rapeseed oil and sunflower seed oil came out to be important substitutes for it in Sudan and Syria respectively. The prices of substitute oils in almost all countries have been found to play an important role in shaping the palm oil demand in the long-run. Palm oil demand in all countries turned to be significantly dependent on income. The coefficients of the dummy variables to capture the previously mentioned events (e.g. trade embargos on Libya and Iraq, the anti-tropical vegetable oils campaign, etc), came out to be more significant in the long-run. The anti- tropical oils campaign organised by the American Soybean Association produced a significant negative effect on the Algerian as well as the Iranian import demand for palm oil. The increased market promotion efforts by Malaysia proved to have a highly significant role in boosting the import demand for palm oil in Egypt. The most sequential determinants of volume of imported palm oil in Libya are the exchange rate and the trade embargo imposed by UN on Libya as they produced a negative effect on the demand. However the Gulf crisis and imposition of economic sanctions on Iraq played a very significant positive role in expanding the import demand for palm oil in Jordan. The deterioration in vegetable oils production in Sudan played an important role in augmenting the palm import demand by Sudan. The results point out to the positive influence of the high discount on palm oil price in increasing its demand by Turkey. The findings indicate that the sharp increase in world petroleum prices in 1970s contributed significantly to the palm oil import demand in Saudi Arabia. Since all models are in logarithmic form, the coefficients on the explanatory variables represent the long-run (constant) elasticities.

The Short-run Dynamics and the Adjustment towards the Long-run Equilibrium

The results of the error correction representations for the selected ARDL models corresponding to palm import demand functions throughout the ten countries are displayed in Table (3). The error correction term was found to be highly significant and have negative signs in the ten error correction models giving additional evidence as to the existence of long term causal relationships between the variables of all the equations. Furthermore, the large magnitude of the error correction term coefficients across the countries, excluding Sudan and Egypt, implies the high speed of adjustment of the dependant variable to the variations in its determinants. Given the existence of a cointegrating relationship, the short-run elasticities can be derived from the corresponding error correction models.

Long- run and Short-run Import Demand Elasticities

Table (4) summarises the estimated long-run and short-run palm oil import demand elasticities for the selected MENA countries. All the long-run elasticities are greater in absolute value than their short-run counterparts, as economic theory suggests. A strict comparison with the elasticity values from other studies is difficult because of differences in methodology and variable definition specifically; other studies are not based on the cointegration methodology used in this study. Furthermore most of the available studies estimate the export demand for Malaysian palm oil in different countries, while this study estimated the total palm oil imports by the selected countries. Most palm oil market models used the linear form, while this study uses the log linear form. Gujarati (1995) affirmed that different functional forms yield different values of elasticity. The elasticity obtained from linear form is average price elasticity while the one obtained from the log-linear form is constant, irrespective of   the price at which it is measured. In addition this study is dealing with countries of different

nature, where there is a wide range variation in import quantities that stretch from one digit figures at the beginning of the sample to four or five digit numbers at late observations.

A brief scan through the long and short –run elasticities reveals that for all the selected countries the own and cross price elasticities were very high, both in the long run and short-run, except for Sudan, where the long run elasticities are high, but turned to be inelastic in the short run. As for Saudi Arabia the palm oil import demand was inelastic to the substitute price, both in the long run and short-run.

Overall, the results yield some large elasticities. The sizes of elasticities are not surprising, given the competitive structure of the international fats and oils market. Importers in the fats and oils market have a choice of many highly interchangeable products, thus the substitution opportunities among them are numerous which is consistent with large own and cross price elasticities. The higher elsticities in the Mediterranean countries (Algeria, Morocco and Turkey) might be due to their proximity of those countries to Europe and to the deeper trade relationship between them and the EEC countries, which give them easier access to substitute oils, such as soybean, rapeseed and sunflower oils, thereby increase the competition between those oils and palm oil.

Although strict comparison with the elasticity values from other studies is difficult because of the differences mentioned previously, the results of the short- run elasticities in Sudan are, nonetheless, broadly in line with the findings of Shamsudin and Arshad (1993) and Talib and Darawi (2002), which suggest inelastic palm oil demand . The high long- run demand elasticities with respect to own and cross prices are consistent with the findings of Reed et al. (1985), Suryana (1986) Au and Boyd, (1992) and Othman et al. (1995). On the whole, the high income elasticity values for all countries apart from Sudan are broadly in line with the results of Au and Boyd (1992) who used GDP as proxy for income (as the case in this study), and Suryana (1986).

Forecasting Palm Oil Import Demand

In order to ascertain the adequacy of the assumed models in forecasting the import demand for the selected MENA countries, a simulation exercise was done to evaluate the predictive power of the specified models based on the results of the Theil's inequality coefficients (U) criteria. The results of the historical simulations of different models (Table 6) reveal that all values of U are less than one, suggesting the superiority of the models over the naive no-change models. The values of U^m are all very close to zero, indicating the non-existence of a systematic bias. Thus, revision of the models is not necessary. The values of U_s are also very small, which indicate that the models are able to replicate the degree of variability in the variables of interest. All the values of U_C are large (close to one), suggesting the non – existence of unsystematic error in the models. The results of the stability tests discussed earlier, give further support of the adequacy of the estimated models for forecasting purposes.

Palm Oil Import Demand Projections

Table (7) displays the projected palm oil imports, for each of the nine countries under study, under three economic growth scenarios, namely high, moderate and low income growth scenarios. The values of the assumed growth rates vary in different countries according to the past annual growth rate and the volatility in income levels. The medium or moderate growth rate assumes that the country of interest maintains its past growth rate, while the high and low scenarios try to project the situation if income growth rate increases or decreases during the forecasting period.

The assumed high, medium and low income growth rates for Algeria were 3%, 2%, and 1% per annum respectively. The study presumed 5%, 3%, and 1% to represent the three income growth rate categories for Iran, Libya, Egypt and Syria, while it specified 4%, 3% and 2% for Jordan, 4%, 2%and 0%, or no income growth, for Saudi Arabia. 7%, 5% and 3% were the presumed high, medium and low income growth rates for Sudan, and the study further assumed 6%, 3% and 0% for each of Morocco and Turkey, which exhibited the highest degree of income volatility among the ten countries.

All the forecasts are sensitive to changes in the assumed income growth rates. The 3% per annum income growth scenario is expected to produce more than double the 1% income growth scenario of projected palm oil imports by Algeria by 2012. Changing the income growth rate from 1% to 5% is expected to produce only about 30% increase in palm oil imports projections for Jordan. However a similar change in the income growth scenarios will cause the projected palm imports by Iran, Libya and Syria to double by 2012. A similar effect on palm oil imports projections for Jordan will be produced by increasing the assumed income growth from 2% to

4%. Changing the income growth rate for Morocco from 0%, where the change in the import demand is exclusively determined by population growth, to 6% is expected to lead to twenty fold increase in its imports of palm oil, while a similar change in the assumed income growth rate for Turkey is expected to produce an eight fold projection. The shift from assuming a low income growth of Saudi Arabia to an assumed high income growth will cause the projected palm oil imports there to increase from 130 thousand tons to 171 thousands i.e. it will bring about 36% increase in the projection. The impact of such a change in Sudan is less pronounced, where the difference between the two income growth scenarios is only 14%, despite the relatively high income growth rates. That is mainly because of the low income elasticity of demand there.

In absolute term, 'low growth' scenario is projected to bring about 12% to 66% increase in palm oil imports in 2012, with the least percentage increase in Turkey and the highest in Algeria. Under the same scenario, the imports of palm oil are expected to increase by about 30% in each of Egypt, Libya, Saudi Arabia, and Syria, and about 40% in Iran, Jordan and Sudan, while the same assumed income growth rate is expected to lead to an increment of only 15% in the palm oil imports by Morocco as compared with the base year.

The Medium growth scenarios show that under this assumed level of income growth rate the volume of imports is expected to approximately double in each of Algeria, Iran and Syria, triple in Turkey, and a five fold expansion is expected to occur in Morocco. Under same scenario the imports of Jordan and Saudi Arabia are assumed to increase by 53%, while they are expected increase in Egypt, Libya, and Sudan by 43%, 46% and 40 % respectively.

The high income growth rate scenario presumes the imports to almost double in Egypt, Iran, Jordan, Libya, Saudi Arabia and Syria, triple in Iran, quadruple in Algeria, eight fold in Turkey and twenty times in Morocco. The least expansion under this scenario is projected to take place in Sudan which is expected to raise its imports by about 48% only, while the highest increase in imports is expected to occur in Morocco.

Comparing the volume of palm oil imports by the ten countries under study in 2002 Turkey topped the list with highest uptake of palm oil of 259 thousand tons followed by Egypt, Jordan and Saudi Arabia with 143 thousand, 138 thousand and 97 thousand tons respectively, whereas the bottom of the list was occupied by Libya. Assuming that the same scenarios prevail across the ten countries simultaneously, Turkey will maintain its status in 2012 projections as the top importer among them under the three scenarios, whereas Libya is expected to retain its position with the least amount of palm oil imports. Nevertheless, Algeria is expected to proceed to take the fourth rank under the low income case, and further take the second place with the medium and high scenarios. A possible rationalization might be that higher income growth effect will overcome the influence of the negative time trend in Algeria, discussed earlier, due to the high income elasticity of demand there. Egypt is expected to occupy the third position under the low and high income growth rate scenarios, and engage the fourth position under the medium growth scenario, exchanging places in each case with Jordan.

The visual examination of the graphs representing the projections of palm oil imports by the selected MENA countries (Figures1-10), reveal that the plots for projected import demand under different income scenarios for all the countries, except for Algeria, Morocco and Turkey, are almost straight lines, indicating steady increase in the projections over time. However, the plots for the moderate and high income growth rate for Algeria, the high income growth rate in Turkey and Morocco, are obviously curving up, indicating that import demand under these scenarios is expected to increase over time at an increasing rate due to the high income elasticities in those countries.
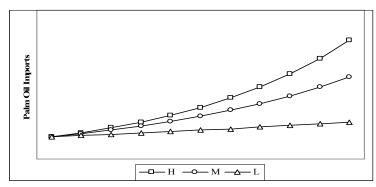
Figure1: Projections of Palm Oil Imports by Algeria in 2003-2012
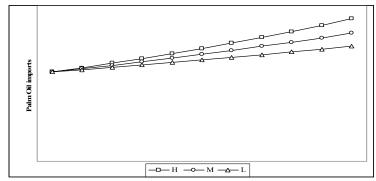
Figure2: Projections of Palm Oil Imports by Egypt in 2003-2012
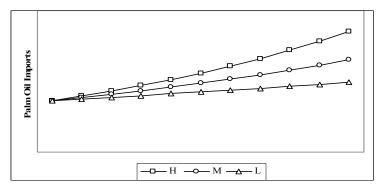
Figure3: Projections of Palm Oil Imports by Iran in 2003-2012
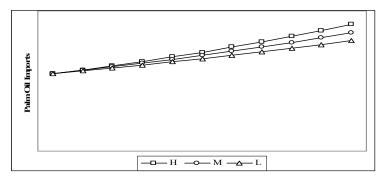
Figure 4: Projections of Palm Oil Imports by Jordan in 2003-2012
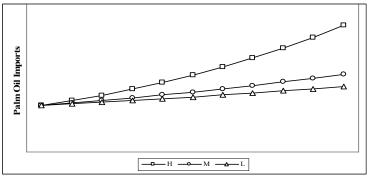
Figure 5: Projections of Palm Oil Imports by Libya in 2003-2012
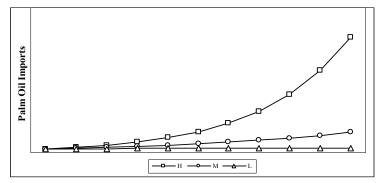
Figure 6: Projections of Palm Oil Imports by Morocco in 2003-2012
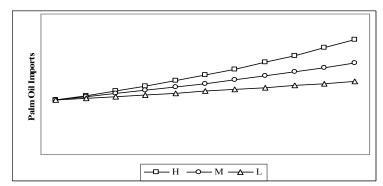
Figure7: Projections of Palm Oil Imports by Saudi Arabia in 2003-2012
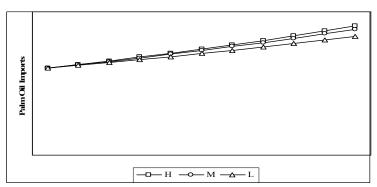
Figure 8: Projections of Palm Oil Imports by Sudan in 2003-2012
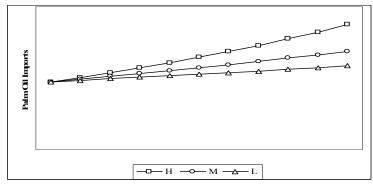
Figure 9: Projections of Palm Oil Imports by Syria in 2003-2012
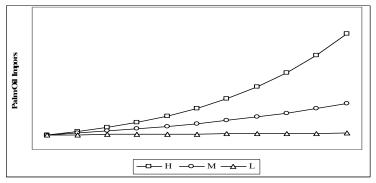
Figure10: Projections of Palm Oil Imports by Turkey in 2003-2012

CONCLUSIONS

The results of palm import demand equations provide the following findings or conclusions. First, the palm oil price variable across the ten models was found to be significant, and the palm oil demand for all countries turned to be highly sensitive to this variable. Secondly, the price of substitute oils in almost all countries have been found to be an important determinant for palm oil demand which is also sensitive to this variable in approximately all countries. Thirdly, the exceptionally high palm oil discount was an important factor in raising the Turkish demand for palm oil. From a policy point of view, these findings emphasize the need for reorientation of palm oil marketing policies in a way that would make it possible to capture ever increasing market share through adopting suitable price policies. The anti-palm oil campaign came out to be an important factor that had negatively affected the palm oil import demand in Algeria and Iran, which implies more extensive effort for improving the image of palm oil as a healthy oil, is required there. The Malaysian market promotion effort proved to have an overwhelming influence in expanding the demand for palm oil in Egypt. Such a successful policy might be equally successful in other MENA countries where palm oil need to be introduced and backed by extending technical advices that might improve its uses there. Projections for palm oil import demand under the three income growth scenarios revealed that import demand is expected to increase in all the countries under consideration, with variations in the magnitude of expansion among them, indicating the good potentiality of this market for absorbing more palm oil.

Table1: F-Statistics for Testing the Existence of Long-run Relationships

Variables	ρ	F-Statistic
F(LNQA/ LNPPA, LNSOPA, LNIA, D_h,C,T)	1	4.9125[a]**
F(LNQE/ LNPPE, LNSOPE, LNIE,D_{80}, C)	1	6.5644[b]***
F(LNQR/ LNPPR, LNSOPR, LNIR,D_h, C)	1	4.6662[b]**
F(LNQJ/ LNPPJ, LNSOPJ , LNIJ,$D_{91,}$ C)	1	5.9513[b]***
F(LNQL/ LNPPL, LNCPL, NIL,D_{94}, C)	1	4.5284[b]**
F(LNQM/ LNPPM, LNSOPM, LNIM, C)	1	5.7875[b]***
F(LNQSA/ LNPPSA,LNCPSA, LNISA,$D_{O,}$ C)	1	7.2226 [b]***
F(LNQSD/ LNPPSD, LNRPSD, LNISD, $D_{81,}$ C)	1	5.5341[b]**
F(LNQSY/ LNPPSY, LNSNPSY, LNISY,C)	1	8.6829[b]***
F(LNQT/ LNPPT, LNSOPT, LNIT,$D_{75, C}$)	2	5.7901[b]***

Notes: a=Table CI(v)Case V : Unrestricted intercept and unrestricted trend (Pesaran et al. page 301).
     b =Table CI(iii)Case III: Unrestricted intercept and no trend (Pesaran et al. page 300).
     Asterisks *, **, *** denote 10%, 5% and 1% significance levels respectively.

Table 2: Autoregressive Distributed Lag Estimates (Dependent Variable is LNQ)

Regressors	Algeria Coefficient	Egypt Coefficient	Iran Coefficient	Jordan Coefficient	Libya Coefficient	Morocco Coefficient	S. Arabia Coefficient	Sudan Coefficient	Syria Coefficient	Turkey Coefficient
LNQ(-1)	.25047	.53269	.28683	21819	.34709	.27232	.34214	.54192	.35810	.48792
	(1.4376)	(5.9398)***	(2.2898)**	(1.3757)	(2.2153)**	(1.8912)*	(4.5892)***	(8.9325) ***	(2.2208)**	(4.1038) ***
LNQ(-2)	-	-	-	-	-	-	-	-	-	-.32700
	-	-	-	-	-	-	-	-	-	(-2.9756)***
LNPP	-3.7736	-1.4523	-2.4774	-.92769	-1.0131	-3.0164	-.85247	-.48279	-1.8895	-2.7805
	(-2.5810)**	(-1.8206)*	(-3.4476)***	(-2.0523)*	(-1.9819)*	(-2.8853)***	(-1.7260)*	(-2.1137) **	(-2.4940)**	(-2.7277)**
LNPP(-1)	-1.2316	-	-	-.41846	-	-	-	-	-	-
	(-1.9476)*	-	-	(-1.4689)	-	-	-	-	-	-
LNSOP	4.0014	2.2130	1.8464	.78514	-	3.6555	-	-	-	2.5960
	(2.3789)**	(2.1047)**	(2.2444)**	(1.3412)	-	(3.3052)***	-	-	-	(2.3673)**
LNSNP	-	-	-	-	-	-	-	-	2.5100	-
	-	-	-	-	-	-	-	-	(2.7205)**	-
LNCP	-	-	-	-	.25819	-	.16285	-	-	-
	-	-	-	-	(.30554)	-	(.24107)	-	-	-
LNCP(-1)	-	-	-	-	.93948	-	-	-	-	-
	-	-	-	-	(2.1270)**	-	-	-	-	-
LNRP	-	-	-	-	-	-	-	.44210	-	-
	-	-	-	-	-	-	-	(2.1276)**	-	-
LNI	1.4441	.31257	1.2373	.66761	.51403	3.9673	.57319	.15959	.64900	3.6556
	(.84372)	(1.7784)*	(3.5922)***	(4.1266)***	(2.3503)**	(1.9407)*	(2.1438)**	(2.1808)**	(2.7353)**	(2.3137) **
LNI(-1)	2.1918	-	-	-	-	0.9559	-	-	-	-
	(1.3753)	-	-	-	-	(0.8488)	-	-	-	-
LNEX	-	-	-	-	-1.7888	-	-	-	-	-
	-	-	-	-	(-3.1204)***	-	-	-	-	-
T	-.43166	-	-	-	-	-	-	-	-	-
	(-2.2624)**	-	-	-	-	-	-	-	-	-
C	-.91196	-5.5344	3.1026	5.1242	3.5064	-26.5184	4.5638	2.3121	-3.7556	-51.0370
	(-.23385)	(-1.8047)*	(.62605)	3.8128***	(1.4111)	(-2.5893)**	(2.0305)*	(1.6587)	(-.92972)	(-1.9651)*
D_h	-1.4813	-	-2.1213	-	-	-	-	-	-	-
	(-2.0327)*	-	(-2.3364)**	-	-	-	-	-	-	-
D_o	-	-	-	-	-	-	3.7493	-	-	-
	-	-	-	-	-	-	(7.3740)***	-	-	-
D_{75}	-	-	-	-	-	-	-	-	-	4.0049
	-	-	-	-	-	-	-	-	-	(6.5555) ***
D_{80}	-	2.6754	-	-	-	-	-	-	-	-
	-	(5.4031)***	-	-	-	-	-	-	-	-

Regressors	Algeria Coefficient	Egypt Coefficient	Iran Coefficient	Jordan Coefficient	Libya Coefficient	Morocco Coefficient	S. Arabia Coefficient	Sudan Coefficient	Syria Coefficient	Turkey Coefficient

Table: 2 Autoregressive Distributed Lag Estimates (Continued)

Regressors	Algeria Coefficient	Egypt Coefficient	Iran Coefficient	Jordan Coefficient	Libya Coefficient	Morocco Coefficient	S. Arabia Coefficient	Sudan Coefficient	Syria Coefficient	Turkey Coefficient
D_{81}	-	-	-	-	-	-	-	2.3498	-	-
	-	-	-	-	-	-	-	(6.5500) ***	-	-
D_{91}	-	-	-	1.3906	-	-	-	-	-	-
	-	-	-	(4.5614)***	-	-	-	-	-	-
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
D_{94}	-	-	-	-	-1.1919	-	-	-	-	-
	-	-	-	-	(-2.813)***	-	-	-	-	-
Adjusted R^2	78%	98%	92 %	94%	75%	81%	98%	99%	84%	94%
F-statistic	12.01[.000]	211.542[.000]	72.171[.000]	75.798[.000]	12.682[.000]	27.060[.000]	50.18[.000]	100.71[.000]	21.872[.000]	33.121[.000]
Diagnostic Tests (χ^2)										
Serial Correlation	2.6869[.101]	.00945[.923]	.2164[.642]	. 0135[.907]	.02959[.863]	2.7813[.105]	.10705[.744]	.92243[.337]	2.5934[.107]	.73249[.392]
Functional Form	.0872[.768]	.77235[.379]	1368[.339]	.0809[.776]	1.7134[.191]	.25410[.614]	1.3897[.238]	.02285[.880]	.70459[.401]	2.2980[.145]]
Normality	.802[.670]	4.4838[.106]	43627[.804]	.8224[.663]	1.0921[.579]	2.7714[.250]	1.4860[.476]	3.1466[.207]	50404[.777]	1.9231[.382]
Heteroscedasticity	.6073[.436]	.00293[.957]	.2050[.272]	.0950[.758]	.06677[.796]	1.5797[.158]	.0024[.960]	1.9099[.167]	1.3740[.241]	1.2451[.264]

Notes: Country notations in the variable symbols are suppressed for writing convenience (i.e. Q, PP, SOP, SNP,CP, RP, EX, I are palm oil imports quantity, palm oil price, soybean oil price, sunflower seed oil price, corn oil price, rapeseed oil price, exchange rates and income respectively for the country of interest). Figures in parentheses below the coefficient values are the T-Ratio values. Figures in square brackets are the probability values. Asterisks *, **, *** denote 10%, 5% and 1% significance levels respectively.

Table 3: Estimated Long Run Coefficients Using the ARDL Approach (Dependent Variable is LNQ)

Regressors	Algeria Coefficient (T- Ratio)	Egypt Coefficient (T- Ratio)	Iran Coefficient (T- Ratio)	Jordan Coefficient (T- Ratio)	Libya Coefficient (T- Ratio)	Morocco Coefficient (T- Ratio)	Saudi Arabia Coefficient (T- Ratio)	Sudan Coefficient (T- Ratio)	Syria Coefficient (T- Ratio)	Turkey Coefficient (T- Ratio)
LNPP	-6.6777 (-2.3421)**	-3.1078 (-2.1563)**	-3.4738 (-.3134)***	-1.7218 (-.0567)***	-1.5517 (-1.9176)*	-4.1451 (-2.3368)**	-1.2958 -1.9943*	-1.0539 (-2.2599)**	-2.9436 (-2.4581)**	-3.3138 (-2.4233)**
LNSOP	5.3386 (1.9485)*	4.7355 (2.2195)**	2.5890 (2.2213)**	1.0043 (2.3173)**	- -	(2.7542)** 6.7656	- -	- -	- -	3.0939 (2.1654)**
LNSNP	- -	- -	- -	- -	- -	- -	- -	- -	3.9104 2.8287)***	- -
LNCP	- -	- -	- -	- -	1.8344 (2.1753)**	- -	.24754 (.24237)	- -	- -	- -
LNRP	- -	- -	- -	-- --	- -	- -	- -	.96512 (2.1439)**	- -	- -
LNI	4.8121 (2.7293)**	.66886 (2.4455)**	4.3505 (.6461)***	.85394 (6.0145)***	.78729 (2.7099)**	6.7656 (4.7133)***	.87130 (2.4992)**	.34840 (2.3192)**	1.0111 (3.5994)***	4.3567 (2.6304)**
LNEX	- -	- -	- -	- -	-2.7398 (-2.776)***	- -	- -	- -	- -	- -
T	-.57591 (-2.0966)**	- -	- -	- -	- -	- -	- -	- -	- -	- -
C	-1.2167 (-.23159)	-11.8431 (-1.9523)*	4.3505 (.64615)	6.5542 (3.4407)***	5.3705 (1.4729)	-36.4422 (-3.455)***	6.9374 (1.8689)*	5.0474 (1.7639)*	-5.8508 (-.94603)	-60.8249 (-2.1640)**
D$_h$	1.9763 (-1.8183)*	- -	-2.9745 (-2.1672)**	- -	- -	- -	- -	- -	- -	- -
Do	- -	- -	- -	- -	- -	- -	5.6992 (8.8305)***	- -	- -	- -
D75	- -	- -	- -	- -	- -	- -	- -	- -	- -	4.7730 (6.3583) ***
D80	-	5.7250 (7.1828)***	-	-	-	-	-	-	-	-
D81	- -	- -	- -	- -	- -	- -	- -	5.1298 (9.9152) ***	- -	- -
D$_{91}$	- -	- -	- -	1.7786 (5.0975)***	- -	- -	- -	- -	- -	- -
D94	- -	- -	- -	- -	-1.8255 (-2.765)**	- -	- -	- -	- -	- -

Notes: Country notations in the variable symbols are suppressed for writing convenience (i.e. Q, PP, SOP, SNP, CP,RP, EX, I are palm oil imports quantity, palm oil price, soybean oil price, sunflower seed oil price, corn oil price, rapeseed oil price, exchange rates and income, respectively, for the country of interest.)
Figures in parentheses below the coefficient values are the T-Ratio values. Asterisks *, **, *** denote 10%, 5% and 1% significant

Table 4: Error Correction Representations for the Selected ARDL Models (Dependent variable = dLNQ)

Regressors	Algeria Coefficient	Egypt Coefficient	Iran Coefficient	Jordan Coefficient	Libya Coefficient	Morocco Coefficient	Saudi Arabia Coefficient	Sudan Coefficient	Syria Coefficient	Turkey Coefficient
dLNQ(-1)	- -	- -	- -	- -	- -	- -	- -	- -	- -	.32700 (2.9756) ***
dLNPP	-3.7736 (-2.5810)**	-1.4523 (-1.8206)*	-2.4774 (-3.4476)***	-.92769 (-2.0523)*	-1.0131 (-1.8819)*	-3.0164 (-2.8853)***	-.85247 (-1.5943)	-.48279 (-2.1137) **	-1.8895 (-2.4940)**	-2.7805 (-2.7277) **
dLNSOP	4.0014 2.3789)**	2.2130 (2.1047)**	1.8464 (2.2444)**	.78514 (1.3412)	- -	3.6555 (3.3052)***	- -	- -	- -	2.5960 (2.3673) **
dLNSNP	- -	- -	- -	- -	- -	- -	- -	- -	2.5100 (2.7205)**	- -
dLNCP	- -	- -	- -	- -	.25819 (.30554)	- -	.16285 (.24107)	- -	- -	- -
dLNRP	- -	- -	- -	- -	- -	- -	- -	.44210 (2.1276) **	- -	- -
dLNI	1.4150 (.83825)	.31257 (1.7784)*	1.2373 (3.5922)***	.66761 (4.1266)***	.51403 (2.3503)**	3.9673 (1.9407)*	.57319 (2.1438)**	.15959 (2.1808) **	.64900 (2.7353)**	3.6556 (2.3137) **
dLNEX	- -	- -	- -	- -	-1.7888 (-3.1204)***	-	- -	- -	- -	- -
DT	-.43166 (-2.3232)**	- -	- -	- -	-	-	- -	- -	- -	- -
dC	-.91196 (-.23385)	-5.5344 (-1.8047)*	3.1026 (.62605)	5.1242 (3.8128)	3.5064 (1.4111)	-26.5184 (-2.5893)**	4.5638 (2.0305)*	2.3121 (1.6587)	-3.7556 (-.92972)	-51.0370 (-1.9651) ***
dDh	-1.4813 (-2.0327)*	- -	-2.1213 (-2.3364)**	- -	- -	- -	- -	- -	- -	- -
dDo	- -	- -	- -	- -	- -	- -	3.7493 (7.3740)***	- -	- -	- -
dD75	- -	- -	- -	- -	- -	- -	- -	- -	- -	4.0049 (6.5555)***
dD80	- -	2.6754 (5.4031)***	- -	- -	- -	- -	- -	- -	- -	- -
dD81	- -	- -	- -	- -	- -	- -	- -	2.3498 (6.5500) ***	- -	- -
dD94	- -	- -	- -	- -	-1.1919 -2.8126)***	- -	- -	- -	- -	- -
ect(-1)	-.74953 (-4.3020)***	-.46731 (-5.2108)***	-.71317 -4.5935)***	-.78181 (-4.9295)***	-.65291 (-4.1673)***	-.72768 (4.7254)***	-.65786 (-8.8240)***	-.45808 (-7.5504) ***	-.64190 -3.9807)***	-.83908 -7.7718) ***
R^2	62%	76%	61%	59%	66%	64%	85%	71%	58%	92%
$\overline{R}^2$	54%	70%	53%	52%	54%	57%	83%	64%	53%	80%
DW-statistic	1.7407	1.8808	1.8808	1.9394	1.9924	2.1812	2.1496	2.0588	2.1440	2.1958
F statistic	5.2794[.002]	12.5146[.000]	5.5871[.001]	6.7604[.000]	7.2057[.000]	11.4142[.000]	52.0201[.000]	12.1203[.000]	6.554[.001]	10.657[.000]

Notes: see the notes in tables 2 and 3;   d denotes the first difference of the variables;   ect is the error correction term.

Table(5): Short-run and Long-run Elasticities for the Palm Oil Import Demand for Selected MENA Countries

	Algeria	Egypt	Iran	Jordan	Libya	Morocco	S. Arabia	Sudan	Syria	Turkey
Short- run elasticities										
Palm oil price	-3.7736	-1.4523	-2.4774	-.92769	-1.0131	-3.0164	-.85247	-.48279	-1.8895	-2.7805
Soybean oil price	4.0014	2.2130	1.8464	.78514	-	3.6555	-	-	-	2.5960
Sunflower oil price	-		-	-	-	-	-	-	2.5100	-
Corn oil price	-		-	-	.25819	-	.16285	-	-	-
Rapeseed oil price	-		-	-	-	-	-	.44210	-	-
Income elasticity	1.4150	.31257	1.2373	.66761	.51403	3.9673	.57319	.15959	.64900	3.6556
Long-run elasticities										
Palm oil price	-6.6777	-3.1078	-3.4738	-1.7218	-1.5517	-4.1451	-1.2958	-1.0539	-2.9436	-3.3138
Soybean oil price	5.3386	4.7355	2.5890	1.0043	-	5.0235	-	-	-	3.0939
Sunflower oil price	-		-	-	-	-	-	-	3.9104	-
Corn oil price	-		-	-	1.8344	-	.24754	-	-	-
Rapeseed oil price	-		-	-	-	-	-	.96512	-	-
Income elasticity	4.8121	.66886	1.7349	.85394	.78729	6.7656	.87130	.34840	1.0111	4.3567

Table 6: Historical Simulation Results of Palm Oil Import Demand in MENA Countries

Country	U	U_M	U_S	U_C
Algeria	0.058	0.081	0.012	0.906
Egypt	0.024	0.013	0.016	0.971
Iran	0.049	0.022	0.001	0.977
Jordan	0.021	0.030	0.004	0.965
Libya	0.039	0.035	0.019	0.946
Morocco	0.032	0.006	0.017	0.977
Saudi Arabia	0.023	0.010	0.001	0.989
Sudan	0.028	0.005	0.030	0.965
Syria	0.031	0.100	0.004	0.885
Turkey	0.027	0.004	0.010	0.986

Notes:

U= Theil's Inequality Coefficient.
U_M =Fraction of error due to bias.
U_S = Fraction of error due to different variations.
U_C = Fraction of error due to different covariations.

Table 7: Projections of Palm Oil Imports by MENA Countries in 2003-2012

Income growth	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Algeria										
H(3%)	102544	116785	133005	151477	172514	196473	223760	254836	290228	330535
M(2%)	98637	108057	118376	129680	142064	155631	170493	186774	204611	224150
L(1%)	94731	99667	104861	110325	116075	122123	128487	135183	142227	149639
Egypt										
H(5%)	150054	157237	164764	172651	180915	189576	198650	208160	218124	228565
M(3%)	148457	153909	159561	165420	171495	177792	184321	191090	198107	205381
L(1%)	146861	150617	154469	158419	162471	166626	170887	175257	179739	184336
Iran										
H(5%)	55679	60595	65944	71767	78103	84998	92502	100669	109557	119230
M(3%)	54200	57418	60827	64438	68264	72317	76611	81159	85978	91082
L(1%)	52720	54326	55981	57686	59443	61253	63119	65041	67022	69063
Jordan										
H(4%)	144919	152232	159915	167985	176462	185367	194721	204548	214870	225714
M(3%)	143937	150177	156687	163479	170565	177959	185673	193722	202120	210881
L(2%)	142956	148135	153502	159064	164827	170799	176988	183401	190046	196931
Libya										
H(5%)	5259	5531	5818	6119	6436	6770	7121	7489	7877	8285
M(3%)	5193	5394	5603	5820	6045	6279	6522	6774	7036	7308
L(1%)	5128	5259	5393	5531	5673	5818	5966	6119	6275	6436
Morocco										
H(6%)	10929	14779	19986	27026	36547	49422	66832	90376	122213	165267
M(3%)	9562	11313	13385	15837	18737	22168	26228	31032	36715	43439
L(0)	8195	8310	8426	8544	8664	8785	8908	9033	9159	9287
Saudi Arabia										
H(4%)	103012	108991	115318	122011	129093	136586	144514	152902	161777	171167
M(2%)	101598	106020	110634	115449	120474	125717	131188	136898	142856	149073
L(0%)	100184	103090	106079	109156	112321	115579	118930	122379	125928	129580
Sudan										
H(7%)	15866	16571	17306	18074	18877	19715	20590	21504	22458	23455
M(5%)	15760	16350	16962	17597	18255	18938	19647	20382	21145	21936
L(3%)	15655	16131	16623	17129	17650	18188	18742	19312	19901	20507
Syria										
H(5%)	40351	42898	45607	48486	51546	54801	58260	61938	65848	70005
M(3%)	39753	41593	43518	45532	47639	49843	52150	54563	57088	59730
L(1%)	39113	40264	41449	42668	43924	45216	46547	47917	49327	50778
Turkey										
H(6%)	319098	392118	481849	592113	727609	894111	1098715	1350140	1659099	2038759
M(3%)	290815	325688	364744	408483	457468	512326	573763	642567	719622	805917
L(0%)	262531	265419	268339	271291	274275	277292	280342	283426	286543	289695

Note: H, M and L denote high, moderate and low income growth scenarios respectively.
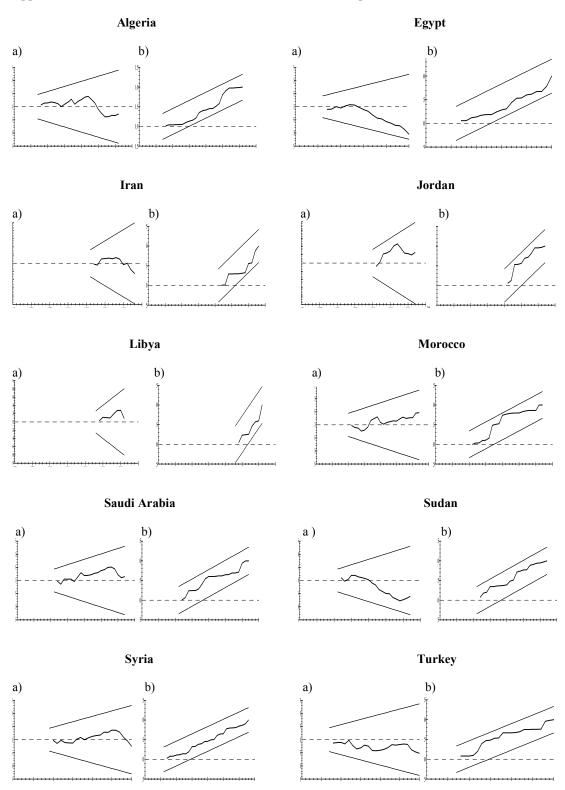
Appendices

Appendix 1: Definitions of Variables

Variables	Definition
QA_t	Quantity of palm oil imports by Algeria in metric ton.
PPA_t	World market nominal prices of palm oil in USD/ metric ton.
$SOPA_t$	World market nominal prices of soybean oil in USD / metric ton.
IA_t	Nominal GDP for Algeria (Billion Algerian Dinars).
QE_t	Quantity of palm oil imports by Egypt in metric ton.
PPE_t	World market nominal prices of palm oil in USD/ metric ton.
$SOPE_t$	World market nominal prices of soybean oil in USD / metric ton.
IE_t	Nominal GDP for Egypt (Billion Egyptian pounds).
QR_t	Quantity of palm oil imports by Iran in metric ton.
PPR_t	Real per unit import value of palm oil in USD / metric ton.
$SOPR_t$	Real per unit import value of soybean oil in USD / metric ton.
IR_t	Real GDP for Iran (Billion Iranian Ryals).
QJ_t	Quantity of palm oil imports by Jordan in metric ton.
PPJ_t	World market nominal price of palm oil in Jordanian Dinars / metric ton.
$SOPJ_t$	World market nominal price of soybean oil in Jordanian Dinars / metric ton.
IJ_t	Nominal GDP for Jordan (Million Jordanian Dinars).
QL_t	Quantity of palm oil imports by Libya in metric ton
PPL_t	World market nominal prices of palm oil in USD/ metric ton.
CPL_t	World market nominal prices of corn oil in USD / metric ton.
EXL_t	Nominal exchange rate for Libya (Libyan Dinars /USD).
IL_t	Nominal GDP for Libya (Billion Libyan Dinars).
QM_t	Q Quantity of palm oil imports by Morocco in metric ton.
PPM_t	World market nominal prices of palm oil in USD/ metric ton.
$SOPM_t$	World market nominal prices of soybean oil in USD / metric ton.
IM_t	Nominal GDP for Morocco (Billion Moroccan Dirhams).
QSA_t	Quantity of palm oil imports by Saudi Arabia in metric ton.
$PPSA_t$	World market nominal prices of palm oil in USD / metric ton.
$CPSA_t$	World market nominal prices of corn oil in USD / metric ton.
ISA_t	Nominal GDP for Jordan (Billion Saudi Riyals).
QSD_t	Quantity of palm oil imports by Sudan in metric ton.
$PPSD_t$	Import price of palm oil in Sudanese Dinars/ metric ton
RSD_t	Import price of rapeseed oil in Sudanese Dinars / metric ton.
ISD_t	Nominal GDP for Sudan (Billion Sudanese Dinars).
QSY_t	Quantity of palm oil imports by Syria in metric ton.
$PPSY_t$	Nominal per unit import value of palm oil in Syrian pounds Syrian pounds/metric ton.
$SNPSY_t$	Nominal per unit import value of sunflower oil in Syrian pounds / metric ton.
ISY_t	Nominal GDP for Syria in Syrian pounds
QT_t	Quantity of palm oil imports by Turkey in metric ton.
PPT_t	Real world market price of palm oil in USD/ metric ton.
$SOPT_t$	Real world market prices of soybean oil in USD / metric ton.
IT_t	Real GDP for Turkey (Billion Turkish Liras).
Vt	Stochastic disturbance term.
D_h	Dummy variable $D_h = 0$ for observations before 1990, $D_h = 1$ from 1990 onwards.
D_o	Dummy variable $D_o = 0$ for observations before 1976, $D_o = 1$ from 1976 onwards.
D_{75}	Dummy variable $D_{75} = 0$ for observations before 1975, $D_{75} = 1$ from 1975 onwards.
D_{80}	Dummy variable $D80 = 0$ for observations before 1980, $D_8 = 1$ from 1980 onwards.
D_{81}	Dummy variable $D81 = 0$ for observations before 1981, $D_{81} = 1$ from 1981 onwards.
D_{91}	Dummy variable $D_{91} = 0$ for observations before 1991, $D_{91} = 1$ from 1991 onwards.
D_{94}	Dummy variable $D_{94} = 0$ for observations before 1994, $D_{94} = 1$ from 1994 onwards.
Q_{fit}	Projected import demand in country i on time t metric tonnes.
Q_{bit}	Import demand in country i in base year t metric tonnes.
$POPG_i$	Population growth in country i.
IG_i	Income growth in country i.
IEL_i	Income elasticity for palm oil in country i.
NOYRS	The number of years between projection year and base year (10 years in this study)

Note: Data for variables are based on annual observations

Appendix 2: Plots of Cumulative Sum and Cumulative Sum of Squares of Recrusive Residuals*

Algeria

a)   b)

Egypt

a)   b)

Iran

a)   b)

Jordan

a)   b)

Libya

a)   b)

Morocco

a)   b)

Saudi Arabia

a)   b)

Sudan

a)   b)

Syria

a)   b)

Turkey

a)   b)

Notes :   a) denotes Plot of (CUSUM) of Recrusive Residuals;
             b) denotes Plot of (CUSUMSQ) of Recrusive Residuals.
             * The straight lines represent critical bounds at 5% significance level.

REFERENCES

Ahmed, I. (1983). *Introduction of Palm Oil Into Egypt*. In PORIM, Proceedings of Workshop on Palm Oil Technical Promotion and Market Development (June 1982). PORIM, Malaysia.

Au, K. and Boyd, M.S. (1992). *An Analysis of Supply Response, Export Demand, and Stocks for Malaysian Palm Oi*l. The Malaysian Journal of Agricultural Economics, 9, 47-58.

Engle R. F. and Granger, C.W.J. (1987). *Co-integration and Error-Correction: Representation, Estimation and Testing*. Econometrica, 55, 251-276.

Ferris J. N. (1998), *Agricultural Prices and Commodity Market Analysis*. Boston: WCB/McGraw-Hill.

Goddard, E.W. and Glance, S. (1989). *Demand for Fats and Oils in Canada, United States and Japan*. Canadian Journal of Agricultural Economics, 37(4), 421-43.

Granger, C. W. J. (1983). *Co-integrated Variables and Error-Correcting Models*, Unpublished University of California,San Diego, Discussion Paper 83-113.

Gujarati, N. D. (1995). *Basic Econometrics*. (3rd edition.), Singapore: McGraw –Hill.

Johansen, S. (1996). Likelihood-Based Inference in Cointegrated Vector-Autoregressive Models. (2nd edition), Oxford, Oxford University Press.

Mohayidin, M.G. and Samdin, Z. (2001) *Food Availability and Consumption Pattern in Malaysia,* In Radam, A. and Arshad, F.M.(Eds). Repositioning of the Agriculture Industry in the Next Millenium. (pp.115-147). Serdang: Universiti Putra Malaysia.

Othman, J., Houston, E.J. and Ames, G.CW. (1995). *Non-economic Distortions in International Agricultural Trade: The Case of Palm Oil in the U.S.* Journal of International Food & Agribusiness Marketing, 7 (2), 79-89 Pesaran, H., Shin, Y., and Smith, R. J. (2001). *Bounds Testing Approaches to the Analysis of Level Relationships*. Journal of Applied Econometrics, 16, 289-326.

Phillips, P. C. B. and Hansen, B. E. (1990). *Statistical Inference in Instrumental Variables Regression with I (1) Processes*. Review of Economic Studies, 57, 99-125.

Shamsudin, M. N. and Arshad, F M (1993).*Malaysian Palm Oil Market Model*, In Arshad, F M; Shamsuddin, M N and Othman, M .S.(Eds.), Malaysian Agricultural Commodity Forecasting and Policy Modelling, Centre of Agricultural Policy Studies (CAPS), University Pertanian Malaysia, 1-12.

Suryana, A. (1986), *Trade Prospects of Indonesian Palm Oil in the International Markets for Fats and Oils*. (*Unpublished Doctoral. Dissertation*), North Carolina State University.

USDA, (2000). *Middle East and North Africa Exhibit Strong Growth in Soybean Trade.* International Agricultural Trade Report, March 21, 2000 http://www.fas.usda.gov/. Accessed on 11th December 2003.

Web, A. J. and Shamsudin, M.,N. (2000). *Forces Shaping Asia's Demand for Vegetable Oils and Protein Meals*. In. Chern, W., S., Carter,C.A. and Shei, S.(Eds.) Food Security in Asia: Economics and Policies pp.229-256.USA:

Cointegration Tests of Purchasing Power Parity in ASEAN Economies

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ABSTRACT
This study employs both the Johansen and Juselius (1990) cointegration test and Bierens's (1997) non-parametric cointegration methodology to test the purchasing power parity (PPP) hypothesis for five major ASEAN economies- Indonesia, Malaysia, the Philippines, Singapore and Thailand, with the U.S. and Japan data as base countries. The results from the Johansen and Juselius method seem to suggest that the long run PPP hypothesis does not hold in the ASEAN-5 economies, regardless of the choice of numeraire currency. However, in both cases of U.S. dollar and Japanese Yen, the Bierens's method provides conflicting results which we interpret as a result of significant non-linearity in the real exchange rate adjustment to PPP. Another important point emerged from the non-parametric cointegration analysis is that the evidence of PPP is much stronger with the Japanese yen as the numeraire currency. These results provide strong evidence of the integration between the Japanese economy and those of ASEAN countries, which are closely linked in geographical, economic and trade terms. The increasing role of Japanese yen in the ASEAN region can be taken as providing empirical support for the formation of a yen dominated ASEAN exchange rate system, or a '*yen bloc*'.

INTRODUCTION

The oldest method of defining long-term exchange rate equilibrium is the purchasing power parity (PPP). The PPP theory simply states that the exchange rate between currencies of two countries should be equal to the ratio of the countries' price level. Although in the short run, deviation of exchange rate from PPP might occur[1], most economic theories suggest that PPP should hold in the long run. The basic idea of PPP was initially advanced by classical economists such as David Ricardo in the 19th century. But it was Gustav Cassel, a Swedish economist, who popularized the PPP in the 1920s.

Over the years, there has been an explosion of empirical research on the validity of PPP hypothesis in the real world[2]. Two widely employed empirical tests for PPP are the unit root methodology and cointegration analysis. A necessary condition for PPP to hold in the long run is that the real exchange rates must be covariance stationary. The standard method for detecting non-stationary behaviour in a time series is to test for the presence of a unit root. Thus, rejection of a unit root in real exchange rates provides evidence supporting PPP. Another stream of literature is based on the cointegration technique. To provide empirical support for PPP, both the

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[1] The deviation can due to factors such as transaction costs, price rigidity, the differential composition of market baskets and prices indices, and imperfect markets (as results of subsidy, taxation, trade barriers, foreign exchange market interventions and the like).
[2] Taylor (1995), Rogoff (1996) and Edison *et al.* (1997) have done an excellent survey on the empirical literature of PPP.

bilateral exchange rates and relative prices must form a cointegrated system with parameters [1, -1]. Specifically, if real exchange rates are stationary, the bilateral exchange rates and relative prices should move together one-for-one in the long run.

Generally, empirical studies on PPP have yielded contradictory results. Even in the ASEAN countries, which have been the focus of both economic growth and success in the last decade and the recent financial turmoil, the results have been mixed, creating a debate among policy makers on the usefulness of the empirical findings. Study by Baharumshah and Ariff (1997) using unit root and Engle and Granger (1987) cointegration approach rejected the PPP proposition for all the five selected ASEAN countries- Indonesia, Malaysia, the Philippines, Singapore and Thailand. Further analysis using the Johansen and Juselius (1990) multivariate approach also failed to support the PPP hypothesis in these countries. Bahmani-Oskooee (1993) who used the Engle and Granger procedure have found evidence in favour of strong PPP hypothesis in the Philippines and weak form in Indonesia, Malaysia, Singapore and Thailand. On the other hand, a recent study by Bahmani-Oskooee and Mirzai (2000) failed to support the mean reversion in real effective exchange rates for Indonesia, Malaysia, the Philippines and Thailand by using the conventional ADF and KPSS unit root tests. To take into account the presence of structural breaks, Aggarwal *et al*. (2000) employed both the single and multiple breaks unit root tests to test the validity of PPP for exchange rates of ASEAN countries. They found strong evidence of long run PPP hypothesis for most of the ASEAN currencies when the Japanese yen is used as the numeraire currency. However, such evidence of PPP is weaker with the U.S. dollar, German mark and the Australian dollar. Another recent study by Azali *et al*. (2001) using panel unit root and panel cointegration showed that PPP does hold in the long run between Japan and ASEAN economies.

With abounding empirical evidence supporting the presence of non-linearity in exchange rate time series data (see, for example, Hsieh, 1989; De Grauwe *et al*., 1993; Steurer, 1995; Brooks, 1996; Mahajan and Wagner, 1999), many researchers started asking themselves to what extent one should trust the results of linear methods like the conventional unit root tests and cointegration tests if the underlying data generating process is non-linear. Taylor and Peel (1997) and Sarno (2000), amongst others, illustrated that the adoption of linear stationarity tests is inappropriate in detecting mean reversion if the true data generating process of exchange rate is in fact a stationary non-linear process. On the other hand, the Monte Carlo simulation evidence in Bierens (1997) indicated that the standard linear cointegration framework presents a mis-specification problem when the true nature of the adjustment process is non-linear and the speed of adjustment varies with the magnitude of the disequilibrium. Other related works are provided by Pippenger and Goering (1993) and Balke and Fomby (1997) which suggest a potential loss of power in standard unit root and cointegration tests under threshold autoregressive data generating process.

Due to the growing views that the world is non-linearly dynamics (Pesaran and Potter, 1993; Campbell *et al*., 1997; Barnett and Serletis, 2000), recent works on non-linear studies have re-energized fresh attention on the PPP hypothesis. Serletis and Gogas (2000) applied non-linear techniques to test for non-linearity in real exchange rate series and found evidence that the behaviour of real exchange rate series under investigate are governed by non-linear dynamics. Other studies like Micheal *et al*. (1997), Sarno (2000) and Baum *et al*. (2001) employed non-linear models such as the Threshold Autoregressive (TAR), Smooth Transition Autoregressive (STAR) and Exponential Smooth Transition Autoregressive (ESTAR) models to model the behaviour of real exchange rates. All these studies provided strong support for the validity of long run PPP, in which the real exchange rates adjust non-linearly towards their equilibrium PPP level. Coakley and Fuertes (2001) utilized both the cointegration tests of Johansen and Juselius (1990) and Bierens (1997) to address indirectly the issue of non-linearity in real exchange rate adjustment. Their results are consistent with non-linear mean reversion.

Theoretically, non-linearities in real exchange rate adjustment can be explained by the occurrence of market frictions such as transaction costs. According to Dumas (1992), the presence of transaction costs in international trade implies that deviations from PPP will only be arbitraged away by rational arbitrageurs if the price differentials exceed transaction costs. Thus, there will be persistent behaviour when PPP deviations are within no-arbitrage bands, that is exchange rate is left unadjusted. However, beyond this band of inaction, there will be mean reversion. Specifically, the larger the deviation, the stronger is the tendency for the exchange rate to adjust back to equilibrium. Thus, the speed of adjustment varies with respect to the size of deviation, thereby justifying the non-linear adjustment of exchange rate towards PPP.

Motivated by the above consideration, in addition to the widely employed standard Johansen and Juselius (1990) cointegration test, this study uses the non-parametric cointegration test recently proposed by Bierens (1997). As pointed out by Bierens (1997), the non-parametric cointegration test is in the same spirit with Johansen and Juselius (1990) approach. The test statistics involved in both approaches are obtained from the solutions of a generalized eigenvalue problem, but in the Bierens's approach a data generating process does not need to be specified and thus this test is completely non-parametric. Therefore, in principle, both approaches should generate a similar outcome. However, the Bierens's method is utilized in this study due to its potential

superiority at detecting cointegration when the error correction mechanism is non-linear (see, for example, Bierens, 1997; Coakley and Fuertes, 2001), as compared to the standard linear Johansen and Juselius (1990) which assumes a constant speed of adjustment.

This paper is organized as follows. Following this introduction, a brief description on the methodology used in this study is given. This is followed in Section III by a discussion on the empirical results. Concluding remarks are given at the end of the paper.

METHODOLOGY

The PPP hypothesis states that the nominal exchange rate (in domestic currency per foreign) should be equal to the ratio of domestic to foreign price as

$$S_t = \frac{P_t}{P_t^*} \tag{1}$$

where S_t is the domestic currency per unit of foreign currency, P_t and P_t^* are the domestic and foreign price indices respectively. If PPP holds, the deviation from long run PPP: $E_t = S_t \frac{P_t^*}{P_t}$, where E_t is the real exchange rate, should imply a stationary process or that shocks have no permanent effect. In the methodology of cointegration, long run PPP is implied by a cointegrating relationship between nominal exchange rates and relative prices, with the cointegrating vector being [1, –1]. Specifically, if real exchange rates are stationary, the nominal exchange rates and relative prices should move together one-for-one in the long run. This study uses both the Johansen and Juselius (1990) and Bierens's (1997) non-parametric cointegration tests to examine the long run PPP hypothesis.

Johansen and Juselius (1990) Cointegration Test

The Johansen and Juselius (JJ) (1990) multivariate cointegration technique uses maximum likelihood procedure to determine the number of cointegrating vectors among a vector of time series. Assume that y_t is modelled as a vector autoregression (VAR):

$$y_t = \Pi_1 y_{t-1} + \Pi_2 y_{t-2} + ... + \Pi_k y_{t-k} + \mu_t \tag{2}$$

where y_t is a column vector of two endogenous variables. Equation (2) can be transformed into first-difference form as follows:

$$\Delta y_t = \sum_{j=1}^{k-1} \Gamma_j \Delta y_{t-j} + \Pi y_{t-k} + \mu_t \tag{3}$$

where Π is the long run relationship between the variables in y_t process. The estimation of the cointegrating vectors can be determined from the matrix of Π, which is written as:

$$\Pi = \alpha \, \beta' \tag{4}$$

where β' is the $(r \times p)$ matrix of cointegrating vectors and α is the $(p \times r)$ matrix of error correction parameters that measure the speed of adjustment in Δy_t. Since the rank of Π is related to the number of cointegrating vectors, thus, if the rank of Π equals to p or full rank, then y_t is a stationary process. If the rank of Π is $0 < r < p$, implying that there are r cointegrating vectors and hence the group of time series contain $(p - r)$ common trends. However, if the rank of Π is zero, then the variables in y_t are non-cointegrated. Here, two likelihood ratio (*LR*) test statistics, namely the trace and maximum eigenvalue statistics are used to determine the number of cointegrating vectors.

The trace statistic tests the $H_0(r)$ against $H_1(p)$, and is written as:

$$\text{Trace} = -T \sum_{i=r+1}^{p} \ln(1 - \hat{\lambda}_i) \tag{5}$$

On the other hand, the maximum eigenvalue statistic tests the $H_0(r)$ against $H_1(r+1)$, which is given by:

$$\text{Maximum eigenvalue} = -T \ln(1 - \hat{\lambda}_{r+1}) \tag{6}$$

In testing for long run PPP hypothesis in the bivariate case, nominal exchange rates and relative prices must exhibit only one cointegrating vector ($p-1$) or one common trend, thus require the imposition of restriction on the coefficients of JJ long-run cointegrating vector in the form of [1, –1]. If the restriction test fails to reject the null hypothesis, then nominal exchange rates will move one-for-one with relative prices, suggesting that PPP holds in the long run.

Bierens (1997) Non-parametric Cointegration Test

The Bierens non-parametric cointegration test considers the general framework as:

$$z_t = \pi_0 + \pi_1 t + y_t \tag{7}$$

where $\pi_0(q \times 1)$ and $\pi_1(q \times 1)$ are optimal mean and trend terms, and y_t is a zero-mean unobservable process such that Δy_t is stationary and ergodic. The general framework assumes that z_t is observable q-variate process for $t = 0, 1, 2, \ldots, n$.

Apart from some mild regularity conditions, or estimation of structural and/or nuisance parameters, further specification of the data-generating process for z_t are not required and thus this test is completely non-parametric.

The Bierens's method is based on the generalized eigenvalues of matrices A_m and $\left(B_m + n^{-2} A_m^{-1}\right)$, where A_m and B_m are defined in the following matrices:

$$A_m = \frac{8\pi^2}{n} \sum_{k=1}^{m} k^2 \left(\frac{1}{n} \sum_{t=1}^{n} \cos(2k\pi(t-0.5)/n) z_t \right) \left(\frac{1}{n} \sum_{t=1}^{n} \cos(2k\pi(t-0.5)/n) z_t \right)'$$

$$B_m = 2n \sum_{k=1}^{m} \left(\frac{1}{n} \sum_{t=1}^{n} \cos(2k\pi(t-0.5)/n) \Delta z_t \right) \left(\frac{1}{n} \sum_{t=1}^{n} \cos(2k\pi(t-0.5)/n) \Delta z_t \right)' \tag{8}$$

which are computed as sums of outer-products of weighted means of z_t and Δz_t, and n is the sample size. To ensure invariance of the test statistics to drift terms, the weight functions of $\cos(2k\pi(t - 0.5)/n)$ are recommended here.

Similar to the properties of the Johansen and Juselius likelihood ratio method, the ordered generalized eigenvalues of this non-parametric method are obtained as solution to the problem $\det[P_n - \lambda Q_n] = 0$ when the pair of random matrices $P_n = A_m$ and $Q_n = \left(B_m + n^{-2} A_m^{-1}\right)$ are defined. Thus, it can be used to test hypothesis on the cointegrating rank r.

To estimate r, two test statistics are used. First, Bierens (1997) derived the 'lambda-min' ($\lambda_{\min}$), $\hat{\lambda}_{n-r_0, m}$, which corresponds to the Johansen's maximum likelihood procedure, to test for the hypothesis of $H_0(r)$ against $H_1(r+1)$. The critical values for this test are tabulated in the same article. Second, Bierens's approach also provides the $g_m(r)$, which is computed from the Bierens's generalized eigenvalues:

$$
\hat{g}_m(r) = \left(\prod_{k=1}^{q} \hat{\lambda}_{k,m} \right)^{-1} \qquad \text{if } r = 0
$$

$$
= \left(\prod_{k=1}^{q-r} \hat{\lambda}_{k,m} \right)^{-1} \left(n^{2r} \prod_{k=n-r+1}^{q} \hat{\lambda}_{k,m} \right) \qquad \text{if } r = 1, \ldots, n-1
$$

$$
= n^{2n} \prod_{k=1}^{q} \hat{\lambda}_{k,m} \qquad \text{if } r = n \tag{9}
$$

This statistic uses the tabulated optimal values (see Bierens, 1997, Table 1) for r, provided $r > q$, and $m = q$ is chosen when $r = n$. Then $\hat{g}_m(r)$ converges in probability to infinity if the true number of cointegrating vector is unequal to r, and $\hat{g}_m(r) = O_p(1)$ if the true number of cointegrating vector is equal to r. Therefore, we have $\lim_{n \to \infty} P(\hat{r}_m = r) = 1$, when $\hat{r}_m = \arg\min_{0 \le r \le 1} \{\hat{g}_m(r)\}$. Thus, this test statistic is useful as a tool to double-check on the determination of r.

Finally, a linear restriction on the cointegrating vectors in the form of $[1, -1]$ is needed to test for long run PPP. For this purpose, Bierens proposed the use of the trace and lambda-max statistics. The critical values of trace ($m = 2q$, $F_k(x) = \cos(2k\pi x)$) and lambda-max tests ($m = 2q$, $F_k(x) = \cos(2k\pi x)$) are given in Bierens (1997, Tables 3 and 4).

EMPIRICAL RESULTS

Data

The Association of Southeast Asian Nations (ASEAN) comprises Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. However, this study focuses only on Indonesia, Malaysia, the Philippines, Singapore, and Thailand (hereafter denotes as ASEAN-5). One main consideration is data availability of the selected member countries.

This study is based on monthly data from 1974.1 to 2002.5 for the countries of ASEAN-5, with the U.S. and Japan data as base countries. The purpose is to find out whether the results of PPP test are invariant to the choice of numeraire currency. The consumer price indices are used to construct the relative price series, which are the ratio of domestic to foreign prices. The nominal exchange rates are expressed as units of local currency per foreign currency. All the data used in this study are obtained from the *International Financial Statistics* database published by the International Monetary Fund. Both the nominal exchange rates and relative prices are transformed into logarithm form.

Stationarity Test

It is important to determine the characteristics of the individual series (in this case, the nominal exchange rates and relative prices) before conducting the cointegration analysis. This is due to the fact that only variables of the same order of integration may constitute a potential cointegration relationship. Specifically, cointegration means that the nominal exchange rates and relative price series may be individually non-stationary, but there may exists a linear combination of these two series which is stationary. Thus, in a cointegrated system, the variables involved cannot move 'too far' apart from each other and any short run deviation from the long-term trend will be corrected.

This study uses the non-parametric Phillips-Perron (PP) (1988) ρ-test to test for non-stationary behaviour in the time series of nominal exchange rates and relative prices. The null hypothesis for the PP test is non-stationarity. The results of the stationarity test on both the nominal exchange rates and relative prices are presented in Table 1 and Table 2. The results clearly indicate that both variables are not stationary in the level but are able to attain stationary in the first-difference. In other words, all nominal exchange rates and relative prices are integrated of order one, or $I(1)$. These results are consistent with the notion that most macroeconomic variables are non-stationary in levels but achieve stationary after first differencing (see, Nelson and Plosser, 1982). With these findings, we can proceed with the cointegration tests to check the validity of the long run PPP hypothesis.

Table 1: Unit Root Test Results (Series in Level)

| | Nominal Exchange Rates | | Relative Prices | |
	Base Country U.S.	Base Country Japan	P / P_{US}	P / P_J
Indonesia	−0.125	−0.374	0.888	0.998
	(0.816)	(0.823)	(0.972)	(0.973)
Malaysia	−1.638	−1.166	−3.562	1.437
	(0.735)	(0.792)	(0.661)	(1.000)
Philippines	−0.367	−0.692	−0.470	−0.091
	(0.901)	(0.898)	(0.943)	(0.977)
Singapore	−2.678	−4.763	−2.011	−13.310
	(0.702)	(0.436)	(0.914)	(0.141)
Thailand	−0.546	−0.920	−1.682	0.455
	(0.762)	(0.823)	(0.899)	(0.997)

Notes: P_{us}, P_j and P denote U.S price indices, Japanese price indices and local price indices respectively. * and ** denote significant at the 5% and 1% levels respectively.

Table 2: Unit Root Test Results (Series in First-Difference)

| | Nominal Exchange Rates | | Relative Prices | |
	Base Country U.S.	Base Country Japan	P / P_{US}	P / P_J
Indonesia	−272.099**	−297.026**	−207.478**	−219.168**
	(0.009)	(0.001)	(0.000)	(0.000)
Malaysia	−319.017**	−369.009**	−346.324**	−364.200**
	(0.001)	(0.000)	(0.000)	(0.000)
Philippines	−430.946**	−332.265**	−227.422**	−252.632**
	(0.000)	(0.000)	(0.000)	(0.000)
Singapore	−320.714**	−414.374**	−372.329**	−412.803**
	(0.000)	(0.000)	(0.000)	(0.000)
Thailand	−236.678**	−268.805**	−289.052**	−543.201**
	(0.001)	(0.000)	(0.000)	(0.000)

Note: See Table 1

Johansen and Juselius (1990) Cointegration Test

Under the Johansen and Juselius method, the Akaike Information Criterion (AIC) is used to determine the order of the VAR model. Table 3 and Table 4 report the trace and maximal eigenvalue statistics based on unrestricted intercepts and no trend in the VAR options. Both statistics are then used to determine the number of cointegrating vectors. In this bivariate case, if both the nominal exchange rates and relative price series are cointegrated, we then proceed with the imposition of restriction on the cointegrating vector in the form of [1, −1]. The failure to reject the null hypothesis will be taken as empirical support for the long run PPP hypothesis.

Table 3 reports the cointegration test results of Johansen and Juselius, with the U.S dollar as the numeraire currency. Both the trace and maximal eigenvalue statistics cannot reject the null hypothesis of no cointegrating vector ($r = 0$) for all the five ASEAN countries. In this case, there is no need to proceed with the restriction test on the cointegrating vector. The results obtained in Table 3 are in line with those reported in Baharumshah and Ariff (1997), Aggarwal *et al*. (2000) and Wang (2000) using Johansen cointegration technique.

When the Japanese Yen is used as the numeraire currency, both the trace and maximal eigenvalue statistics can only reject the null hypothesis of no cointegrating vector ($r = 0$) for Malaysia and Singapore, as reported in Table 4. For these two countries, we proceed to impose the restriction [1, −1] on the cointegrating vector. The results in Table 4 clearly show that the null hypothesis can be rejected in both cases, which provide evidence against the PPP proposition. Thus, the evidence from the Johansen and Juselius method seems to suggest that the long run PPP hypothesis does not hold in the ASEAN-5 economies, regardless of the choice of numeraire currency.

Table 3: Johansen and Juselius Cointegration Test Results (Base Country: U.S.)

Countries	Lag	λ-max		λ-trace		β'
		$H_0: r = 0$	$H_0: r \leq 1$	$H_0: r = 0$	$H_0: r \leq 1$	$H_0: \beta' = [1, -1]$
Indonesia	7	6.134	0.023	6.157	0.023	–
Malaysia	2	11.212	1.429	12.641	1.429	–
Philippines	2	7.245	0.096	7.341	0.096	–
Singapore	1	8.378	1.904	10.282	1.904	–
Thailand	8	11.336	1.373	12.710	1.373	–

Note: The critical values for the trace and maximal eigenvalue statistics are tabulated in Osterwald-Lenum (1992)

Table 4: Johansen and Juselius Cointegration Test Results (Base Country: Japan)

Countries	Lag	λ-max		λ-trace		β'
		$H_0: r = 0$	$H_0: r \leq 1$	$H_0: r = 0$	$H_0: r \leq 1$	$H_0: \beta' = [1, -1]$
Indonesia	4	4.739	0.016	4.75	0.016	–
Malaysia	1	21.686*	0.351	22.037*	0.351	3.949*
Philippines	3	8.110	0.007	8.117	0.007	–
Singapore	1	28.153*	3.863	32.016*	3.863	7.027**
Thailand	1	11.996	0.002	11.997	0.002	–

Note: The critical values for the trace and maximal eigenvalue statistics are tabulated in Osterwald-Lenum (1992). * and ** denote significant at the 5% and 1% level respectively.

Bierens's (1997) Non-parametric Cointegration Test

We then proceed with the Bierens's nonparametric cointegration test in views of its potential superiority over standard linear Johansen and Juselius (1990) method at detecting cointegration when the data generating process is non-linear. Table 5 reports the results of the Bierens's test, with the U.S dollar as the numeraire currency. Clearly, the null of no cointegration cannot be rejected only for the case of Indonesia. By imposing the restriction of [1, –1] on the cointegrating vector, the null hypothesis cannot be rejected for Malaysia, Singapore and Thailand, hence supporting the long run PPP hypothesis. The evidence of mean reversion in dollar denominated real exchange rates for these three ASEAN countries are in sharp contrast with earlier findings and those reported in Baharumshah and Ariff (1997), Aggarwal *et al.* (2000) and Wang (2000) obtained from Johansen cointegration technique.

The conflicting empirical evidence obtained from Johansen approach and the Bierens's results may be due to the presence of non-linearity in the data generating process. Since the Bierens's method has the potential superiority at detecting cointegration when the error correction mechanism is non-linear, the discrepancy between the findings from both approaches is interpreted as a consequence of significant non-linearity in the real exchange rate adjustment to PPP. This interpretation is consistent with Coakley and Fuertes (2001), who have utilized both the cointegration tests of Johansen and Juselius (1990) and Bierens (1997) to address indirectly the issue of non-linearity in real exchange rate adjustment. To justify for the discrepancy, the authors argued that the nonlinear adjustment process in the real exchange rates would cause the standard linear cointegration approach to present a mis-specification problem. In other words, the failure of Johansen and Juselius method to establish real exchange rates stationarity does not necessarily invalidate the long run PPP. Instead, it is the presence of non-linearity that contributes to its poor performance at detecting cointegration.

The results of Bierens's non-parametric cointegration test with the Japanese yen as numeraire currency are reported in Table 6. There is evidence of cointegration for Malaysia, the Philippines, Singapore and Thailand. Even by imposing the [1, –1] restriction, the null hypothesis cannot be rejected. Two important points emerged from the results in Table 6. First, the Bierens's method has once again provide conflicting results as compared to the earlier Johansen and Juselius (1990) cointegration test, which we suspect is due to the presence of non-linearity in the data generating process. Second, the evidence of PPP is much stronger with the Japanese yen as the numeraire country. This finding is in line with Aggarwal *et al.* (2000) who found strong evidence of long run PPP hypothesis for most of the ASEAN currencies when the Japanese yen is used as the numeraire currency. However, such evidence of PPP is weaker with the U.S. dollar, German mark and the Australian dollar. In fact, the choice of numeraire currency can and do matter for testing PPP hypothesis, as reported in Papell and Theodordis (2001).

Table 5: Bierens's Non-parametric Cointegration Test Results (Base Country: U.S.)

Countries	λ_{min}		$g_m(r_0)$	β'
	$H_0: r = 0$	$H_0: r = 1$	$H_0: r_0 = 0, 1, 2$	$H_0: \beta' = [1, -1]$
Indonesia	0.031	3.520	$\mathbf{9.383} \times 10^0$ 9.942×10^2 1.424×10^9	–
Malaysia	0.004*	0.850	$\mathbf{3.146} \times 10^2$ 5.091×10^2 4.248×10^7	2.400
Philippines	0.003*	4.570	2.364×10^3 $\mathbf{2.410} \times 10^0$ 5.652×10^6	12.370*
Singapore	0.008*	0.306	$\mathbf{5.454} \times 10^2$ 2.271×10^3 2.450×10^7	1.330
Thailand	0.002*	0.472	9.679×10^2 $\mathbf{5.355} \times 10^2$ 1.381×10^7	2.010

Note: * denotes significant at the 5% level.

Table 6: Bierens's Non-parametric Cointegration Test Results (Base Country: Japan)

	λmin		$g_m(r_0)$	β'
	$H_0: r = 0$	$H_0: r = 1$	$r_0 = 0, 1, 2$	$H_0: \beta' = [1, -1]$
Indonesia	0.306	4.645	$\mathbf{7.718} \times 10^0$ 6.941×10^2 1.731×10^9	–
Malaysia	0.041	0.098	4.754×10^3 $\mathbf{2.550} \times 10^3$ 2.811×10^6	2.930
Philippines	0.024	1.372	1.417×10^7 $\mathbf{4.337} \times 10^{-3}$ 9.434×10^2	3.340
Singapore	0.009*	0.060	4.269×10^3 $\mathbf{7.634} \times 10^3$ 3.130×10^6	3.800
Thailand	0.001*	0.057	1.639×10^5 $\mathbf{2.187} \times 10^2$ 8.152×10^5	3.100

Note: * denotes significant at the 5% level.

Furthermore, these results provide strong evidence of integration between the Japanese economy and those of ASEAN countries. The increasing role of Japanese yen in the ASEAN region can be taken as providing empirical support for the formation of a yen dominated ASEAN exchange rate system, or a '*yen bloc*', as has been suggested in earlier papers such as Aggarwal and Mougoué (1996, 1998), Tse and Ng (1997), Aggarwal *et al.* (2000) and Azali *et al.* (2001). Several economic explanations have been offered to support the notion of the formation of a '*yen bloc*'. Generally, it is well known that Japan and the ASEAN countries have been closely linked in geographical, economic and trade terms. For example, the geographical proximity of ASEAN countries with Japan makes goods arbitrage more effective since transaction costs are lower. In addition to that, Japan is the major source of foreign direct investment and loan supplier in this region of ASEAN. In terms of trade, Japan is one of the important trading partners for the ASEAN economies. The statistics for year 2001 provided by the ASEAN secretariat revealed that about 14% of total gross ASEAN exports end up in the Japanese market, while 17% of imports come from Japan.

CONCLUSIONS

This study employs both the Johansen and Juselius (1990) cointegration test and Bierens's (1997) non-parametric cointegration methodology to test the purchasing power parity (PPP) hypothesis for five major ASEAN economies- Indonesia, Malaysia, the Philippines, Singapore and Thailand, with the U.S. and Japan data as base countries. The Bierens's approach is selected in views of its potential superiority over standard linear Johansen and Juselius (1990) method at detecting cointegration when the data generating process is non-linear. The results from the Johansen and Juselius method seem to suggest that the long run PPP hypothesis does not hold in the ASEAN-5 economies, regardless of the choice of numeraire currency. However, in both cases of U.S. dollar and Japanese Yen, the Bierens's method provides conflicting results which we interpret as a result of non-linearity in the data generating process.

Specifically, the results obtained from Bierens's non-parametric cointegration test provide evidence of mean reversion in dollar denominated real exchange rates for three ASEAN countries- Malaysia, Singapore and Thailand. These findings are in sharp contrast with the earlier results and those reported in Baharumshah and Ariff (1997), Aggarwal *et al.* (2000) and Wang (2000) using Johansen cointegration technique. Consistent with the interpretation of Coakley and Fuertes (2001), the discrepancy between the findings from both approaches is interpreted as a consequence of significant non-linearity in the real exchange rate adjustment to PPP. To justify for the discrepancy, the authors argued that the nonlinear adjustment process in the real exchange rate would cause the standard linear cointegration approach to present a mis-specification problem. In other words, the failure of Johansen and Juselius method to establish real exchange rates stationarity does not necessarily invalidate the long run PPP. Instead, it is the presence of non-linearity that contributes to its poor performance at detecting cointegration.

Further analysis supports the notion that the choice of numeraire currency can and do matter for the testing of PPP hypothesis. Specifically, the evidence of PPP is much stronger with the Japanese yen as the numeraire country. This finding is in line with Aggarwal *et al.* (2000) who found strong evidence of long run PPP hypothesis for most of the ASEAN currencies when the Japanese yen is used as the numeraire currency. However, such evidence of PPP is weaker with the U.S. dollar, German mark and the Australian dollar. These results provide strong evidence of integration between the Japanese economy and those of ASEAN countries, which have been closely linked in geographical, economic and trade terms. The increasing role of Japanese yen in the ASEAN region can be taken as providing empirical support for the formation of a yen dominated ASEAN exchange rate system, or a '*yen bloc*', as has been suggested in earlier papers such as Aggarwal and Mougoué (1996, 1998), Tse and Ng (1997), Aggarwal *et al.* (2000) and Azali *et al.* (2001).

REFERENCES

Aggarwal, R. and Mougoué, M. (1996) Cointegration among Asian currencies: evidence of the increasing influence of the Japanese Yen. *Japan and the World Economy*, 8, 291-308.

Aggarwal, R. and Mougoué, M. (1998) Common stochastic trends among Asian currencies: evidence for Japan, ASEAN and Asian Tigers. *Review of Quantitative Finance and Accounting*, 10, 193-206.

Aggarwal, R., Montañés, A. and Ponz, M. (2000) Evidence of long-run purchasing power parity: analysis of real Asian exchange rates in terms of the Japanese yen. *Japan and the World Economy,* 12, 351-361.

Azali, M., Habibullah, M.S. and Baharumshah, A.Z. (2001) Does PPP hold between Asian and Japanese economies? Evidence using panel unit root and panel cointegration. *Japan and the World Economy,* 13, 35-50.

Baharumshah, A.Z. and Ariff, M. (1997) Purchasing power parity in South East Asian countries economies: a cointegration approach. *Asian Economic Journal,* 11, 141-153.

Bahmani-Oskooee, M. (1993) Purchasing power parity based on effective exchange rate and cointegration: 25 LDCs' experience with its absolute formulation. *World Development,* 21*,* 1023-1031.

Bahmani-Oskooee, M. and Mirzai, A. (2000) Real and nominal effective exchange rates for developing countries: 1973:1 – 1997:3. *Applied Economics,* 32, 411-428.

Balke, N.S. and Fomby, T.B. (1997) Threshold cointegration. *International Economic Review*, 38, 627-645.

Barnett, W.A. and Serletis, A. (2000) Martingales, nonlinearity, and chaos. *Journal of Economic Dynamics and Control*, 24, 703-724.

Baum, C.F., Barkoulas, J.T. and Caglayan, M. (2001) Nonlinear adjustment to purchasing power parity in the post-Bretton woods era. *Journal of International Money and Finance,* 20, 379-399.

Bierens, H.J. (1997) Nonparametric cointegration analysis. *Journal of Econometrics,* 77, 379-404.

Brooks, C. (1996) Testing for non-linearity in daily sterling exchange rates. *Applied Financial Economics*, 6, 307-317.

Campbell, J.Y., Lo, A.W. and MacKinlay, A.C. (1997) *The econometrics of financial markets*. Princeton: Princeton University Press.

Coakley, J. and Fuertes, A.M. (2001) Nonparametric cointegration analysis of real exchange rates. *Applied Financial Economics,* 11*,* 1-8.

De Grauwe, P., Dewachter, H. and Embrechts, M. (1993) *Exchange rate theory: chaotic models of foreign exchange markets*. Oxford: Blackwell.

Dumas, B. (1992) Dynamic equilibrium and the real exchange rate in a spatially seperated world. *Review of Financial Studies*, 5(2), 153-180.

Edison, H.J., Gagnon, J.E. and Mellick, W.R. (1997) Understanding the empirical literature on purchasing power parity: the post-Bretton woods era. *Journal of International Money and Finance,* 16*,* 1-18.

Engle, R.F. and Granger, C.W.J. (1987) Cointegration and error correction: representation, estimation and testing. *Econometrica,* 55*,* 251-276.

Hsieh, D.A. (1989) Testing for non-linearity in daily foreign exchange rate changes. *Journal of Business*, 62, 339-368.

Johansen, S. and Juselius, K. (1990) Maximum likelihood estimation and inference on cointegration–with applications to the demand for money. *Oxford Bulletin of Economics and Statistics,* 52, 169-210.

Mahajan, A. and Wagner, A.J. (1999) Nonlinear dynamics in foreign exchange rates. *Global Finance Journal,* 10, 1-23.

Micheal, P., Nobay, A.R. and Peel, D.A. (1997) Transactions costs and nonlinear adjustment in real exchange rates: an empirical investigation. *Journal of Political Economy,* 105, 862-879.

Nelson, C.R. and Plosser, C.I. (1982) Trends and random walks in macroeconomic time series. *Journal of Monetary Economics*, 10, 139-162.

Osterwald-Lenum, M. (1992) A note with quantiles of the asymptotic distribution of the maximum likelihood of cointegration rank statistics. *Oxford Bulletin of Economics and Statistics*, 54, 461-471.

Papell, D.H. and Theodordis, H. (2001) The choice of numeraire currency in panel tests of Purchasing Power Parity. *Journal of Money, Credit and Banking*, 33, 790-803.

Pesaran, M.H. and Potter, S.M. (1993) Nonlinear dynamics, chaos and econometrics: an introduction. In M.H. Pesaran and S.M. Potter (eds.) *Nonlinear dynamics, chaos and econometrics,* pp vii-xiii. New York: John Wiley & Sons.

Phillips, P. C. B. and Perron, P. (1988) Testing for a unit root in time series regression. *Biometrika,* 75, 335-346.

Pippenger, M.K. and Goering, G.E. (1993) A note on the empirical power of unit root tests under threshold processes. O*xford Bulletin of Economics and Statistics*, 55, 473-481.

Rogoff, K. (1996) The purchasing power parity puzzle. *Journal of Economic Literature*, 34*,* 647-668.

Sarno, L. (2000) Real exchange rate behaviour in high inflation countries: empirical evidence from Turkey, 1980-1997. *Applied Economics Letters,* 7, 285-291.

Serletis, A. and Gogas, P. (2000) Purchasing power parity, non-linearity and chaos. *Applied Financial Economics*, 10, 615-622.

Steurer, E. (1995) Nonlinear modeling of the DEM/USD exchange rate. In A.P. Refenes (eds.) *Neural networks in the capital markets,* pp.199-211. New York: John Wiley & Sons.

Taylor, M.P. (1995) The economics of exchange rates. *Journal of Economic Literature,* 33*,* 13-47.

Taylor, M.P. and Peel, D.A. (1997). Nonlinearities in real exchange rate adjustment during the recent float: empirical evidence and Monte Carlo analysis. Discussion Paper, Institute of Economics and Statistics, University of Oxford.

Tse, Y.K. and Ng, L.K. (1997) The cointegration of Asian currencies revisited. *Japan and the World Economy*, 9, 109-114.

Wang, P. (2000) Testing PPP for Asian economies during the recent floating period. *Applied Economics Letters*, 7, 545-548.

Financial Market Development, Savings and Growth in Malaysia

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ABSTRACT

Although numerous research has been done on financial market development and savings, and also on savings and growth, there has not been an exclusive study on financial market development, savings and economic growth in Malaysia. This paper focuses exclusively on Malaysia, with the objective of determining whether financial market development has any effect on private savings. Additionally, attempts are also made to determine the causal relationships between financial market development and economic growth, and between savings and economic growth. This research finds no statistically significant link between financial market development and savings, and also between savings and economic growth. However, the results indicate a significant link between financial market development and economic growth, and the causal relationship is from financial market development to economic growth. This is in support of the financial-led hypothesis proposed by some researchers. The results suggest that the link from financial market development to economic growth is not through savings, but through other channels. Moreover, results suggest that for Malaysia, a good indicator of financial market development in analyzing the relationship with economic growth is the Value Traded/Market Capitalization ratio.

INTRODUCTION

Economic growth is of paramount importance to an economy and is the central objective of a country. That is why much research has been done on the determinants of economic growth. One of the critical factors that receive considerable attention is the role of financial market development in economic growth. Economists have differing views on the role of financial market development in economic growth, from those who acknowledge its importance, to those who assume that financial market development follows growth, and to those who simply ignore the role it plays in economic growth. Khan and Senhadji (2000), for example, show a statistically significant relationship between financial market development and growth. However, there is an argument that the relationship reflects reverse causality, that is, faster growth leads to financial deepening (for example, see Levine, 1997).

There is also a belief that financial market development will stimulate savings (Bonser-Neal and Dewenter, 1999). Empirical test relating financial market development to savings is difficult to test owing to the lack of a good proxy for financial market development. Furthermore, the impact of savings on economic growth is also subject to arguments. While the high savings rate in Malaysia has been credited for its remarkable growth in the 80s and 90s, the crisis in Japan has created doubts to the importance of this role. The United States with its low personal savings rate has performed better compared to Japan with its high savings rate.

This paper attempts to analyze the relationship between financial market development, savings and economic growth in Malaysia using historical data from 1971 to 2000. Although numerous research has been done on financial market development and savings, and also on savings and economic growth, there has not been an exclusive study on financial market development, savings and economic growth in Malaysia. Most of the research done is on Southeast-Asian countries as a whole, with Malaysia included as one of the ASEAN countries. The literature reviewed so far has not found a detailed study on the effects of financial market development on savings and on economic growth, and also on the impact of savings on economic growth, concentrating specifically on Malaysia.

REVIEW OF LITERATURE

Savings and Financial Market Development

Savings has traditionally been viewed as one of the channels through which financial market development spurs growth. Therefore, a deeper understanding of the effect of financial market development on savings may

provide insight into the long-run economic growth. Dayal-Gulati and Thimann (1997), examined the determinants of private saving for selected Southeast Asia, with Malaysia as one of the sample, and Latin America for the period 1975-1995. They used pooled time-series and cross-country regressions to establish relationships between private saving rates and a range of policy variables such as fiscal policy, macroeconomic stability and financial market development. They suggest that macroeconomic stability and financial deepening have a positive effect on saving. Furthermore, countries that have fully funded pension systems like Malaysia can expect private saving to increase. However, when withdrawal restrictions are eased, the effect on saving may be smaller. Bonser-Neal and Dewenter (1999) examined the effects of financial market development on savings in emerging markets, including Malaysia. They found that there is a positive relationship between financial market development and savings using 12 years data. However, when two outliers, namely Korea and Malaysia, were removed from the sample, the result is inconclusive.

Mauri and Calamanti (1982) suggested that securities market gives savers a broader choice of financial products most suited to their preferences. This tends to encourage savers to reduce consumption in favor of savings, because of the higher returns expected and also the opportunity to diversify their domestic financial market portfolios. However, the effect would also depend on the ease of access to the financial markets, the availability of institutions that can give sound financial advice to savers, and the availability of efficient market information. Dornbusch and Reynoso (1989) suggest that for growth to spur investment, three conditions must be met: 1) firms must be willing to invest; 2) savings must be available; and 3) these savings must be channeled to those planning to invest with the most attractive investment opportunities.

Levine and Zervos (1996a, 1998) did not find a statistically significant link between private saving rates and either stock market liquidity or banking development. Moreover, they found no support for the theory that stock market liquidity, international capital market integration or stock return volatility reduces private saving rates. They argued that stock market liquidity is positively related to physical capital accumulation, while savings only measure gross private savings of domestic residents. While financial development is significantly associated with future capital stock growth, the major channel through which growth is linked to stock markets and banks is through productivity growth, not capital stock growth. Their research also suggests that saving rates are not proxying for financial sector development and that banks provide different financial services from those provided by stock markets.

In attempting to find out why private saving rate differ from country to country using nearly 30 years of data on 150 countries, Loayza, Schmidt-Hebbel and Servén (2000) suggested that larger financial depth, as measured by M2/GDP and credit ratios, do not raise savings, nor do higher real interest rates. They found that real interest rate has a negative impact on private saving rate, suggesting that its income effect outweighs the sum of its substitution and human-wealth effects. Furthermore, the direct effects of financial liberalization are detrimental to private saving as enhanced credit availability reduces private saving rate.

Savings and Economic Growth

Bonser-Neal and Dewenter (1999) in their research have included real GDP growth and per capita income as some of the factors affecting savings, not the relationship between savings and economic growth as two separate variables. Azman-Saini, Habibullah and Azali (2000) looked at the effect of financial development on economic growth in Malaysia using data from 1955 to 1997, but there was no mention of the effects of savings on economic growth, if any. The higher growth that goes hand in hand with the increase in savings rate has been taken as proof that higher savings will lead to higher growth. However, the Asian financial crisis in 1997-1998 is proof that high saving rates will not be enough to insure against the weaknesses in financial systems, unstable government or unsustainable exchange rate policies.

Bisat, El-Erian and Helbling (1997) and Jappelli and Pagano (1998) found a positive correlation between growth, investment and savings in their Arabs and Italian samples respectively. Another study by Mühleisen in 1997, in analyzing the saving trends in India, found that rising per-capita income and continued financial deepening will increase private saving. Additionally, the most promising way to boost domestic savings would be to increase public saving and through structural reform programs, including financial liberalization. The emphasis on development of long-term saving instruments such as pensions, life insurance and mutual funds, would improve the allocation of savings. This will ensure that funds flow to the most productive investment projects that will generate the highest rate of growth for a given amount of investment. This, in turn, would initiate a virtuous circle in which higher growth would prompt further increases in private saving. Using Granger causality test, he found that growth affects saving, but not the other way round. Vector autoregression approach also point to a strong relationship between GDP growth and both private and public saving.

Andersson (1999) found that Granger-causality between savings and GDP is different across countries. In the UK there is a bi-directional causality between GDP and gross saving, while in Sweden it is more unidirectional as saving dynamics lead output growth. For the US, he found no statistically significant long-run relationship. According to him, the causal chains are complex, and the temporal dependence between output and gross saving will depend on country characteristics such as demographics, structure, trade patterns, institutional or financial market features, and the type of dynamics one is studying. The focus should not be on the saving rate, instead, one should focus on the causal chains linking total saving and output. Loayza, Schmidt-Hebbel and Servén (2000) found that private savings rate rises with the level and growth rate of real per capita income, but the influence of income is larger in developing countries compared to developed countries. On the other hand, Claus, Haugh, Scobie and Törnquist (2001) found that lack of domestic saving in New Zealand does not appear to constrain growth.

Lingle (2000) argued that high savings does not guarantee growth as indicated by Japan's recession and China's deflationary cycle. High savings reduces overall spending and leads to high public and private debt, owing to relatively low borrowing costs. For example, uncertainty about the economy is driving Asians to save more. High savings means less consumption. As a result, inventories are stockpiling and price-cutting reduces profits, unemployment rise and households save even more and spend less. Faced with this scenario, businesses are finding less opportunity to invest and the demand for funds decreased. The gap between supply of funds and demand for it widens. This vicious cycle will continue unless a radical transformation takes place.

Financial Market Development and Economic Growth

Economists hold different opinions regarding the role of financial development in economic growth. Demirguc-Kunt and Levine (1996) compare a broad array of stock development indicators that examine different measures of stock market size, market liquidity, market concentration, market volatility, institutional development, and international integration, with the aim of providing a more accurate depiction of stock market development across 41 countries from 1986 to 1993. They found that different indicator gives different level of stock market development. In addition, they found that large markets are more liquid, less volatile, and more internationally integrated than smaller markets, while countries with markets concentrated in a few stocks tend to have smaller, less liquid, and less internationally integrated markets, and internationally integrated markets are less volatile. Their data suggests that Hong Kong, Singapore, Korea, Switzerland, and Malaysia have highly developed stock markets, some more developed than richer countries like France, Australia, Sweden and Canada. They also found that the level of stock development is highly correlated with the development and efficient functioning of banks, private non-banks, private insurance companies and pension funds.

Levine and Zervos (1996) using pooled cross-country, time series regression on data from 41 countries (including Malaysia) from 1976-1993, found strong correlation between overall stock market development and long-run economic growth. Using measures of overall stock market development proposed by Demirguc-Kunt and Levine (1996), that combines information on stock market size, liquidity, and integration with world capital markets, and real per capita growth, they found a positive correlation between stock market development and economic growth, even after controlling for other factors associated with long-run growth, such as inflation and ratio of government consumption expenditures to GDP. This study, however, does not address the question of causality. Levine and Zervos (1996a) expanded the research to include additional measures of growth. They found stock market liquidity – measured by value of stock trading relative to market size and value of trading relative to the size of the economy - to be positively and significantly correlated with current and future rates of economic growth, capital accumulation, and productivity growth. They also found banking development to be a good predictor of economic growth, capital accumulation, and productivity growth. In addition, the data suggests that banks provide different services from those of stock markets. Therefore, in order to better understand the relationship between financial systems and economic growth, theories that can simultaneously arise to provide different bundles of financial services from stock markets and banks are needed.

Filer, Hanousek and Campos (1999) attempted to test the relationship between stock market development and economic growth in 64 countries using Granger causality test. Three measures of stock market development are used: 1) market capitalization over GDP; 2) turnover velocity (the ratio of turnover to market capitalization), and 3) the change in the number of domestic shares listed. Countries were divided into upper income, upper middle income and lower income countries. They found a positive link between market capitalization and future economic growth, more likely due to the fact that efficient markets incorporate anticipated future growth into current period prices, and therefore market capitalization. The link is more significant for higher income countries as more developed financial markets are able to better incorporate anticipated future growth into current prices, consistent with the efficient market hypothesis. Moreover, results suggest that higher turnover velocity Granger-causes economic growth, but only for high and low-income countries. For low-income countries, the linkage is quite strong and is found between countries. This implies that an active equity market is

an important engine of growth in developing countries as they attract foreign capital. On the other hand, there is no evidence that a change in the number of listed domestic companies will affect the rate of economic growth.

Habibullah (1999) found a strong relationship between financial market development and economic growth in seven Asian countries. However, the direction of causation between finance and economic growth is country specific. In the case of Malaysia, he found a unidirectional Granger-causality from economic growth to financial development, which supports the demand-following hypothesis. Previously, Wood (1993) in his attempt to test the financial development-economic growth causal relationship, found a bi-directional relationship for Barbados using the Granger causality test. However, both authors use M2/GDP as a proxy for financial development.

In another study on the relationship between financial development and economic growth in Malaysia using data from 1955 to 1997, Azman-Saini, Habibullah and Azali (2000) found no support for the long-run relationship between financial development and economic growth, implying that in the long-run, the financial sector growth is irrelevant for Malaysian economic growth. However, in the short-run, Granger causality test indicates a unidirectional causality from economic growth to financial development using the linear specification, while using the log-linear specification they found that financial sector development and economic growth is independent. This shows that the result is dependent on the test used.

Khan and Senhadji (2000), in analyzing the dataset of 159 countries (Malaysia included) from 1960-1999, found a strong positive and statistically significant relationship between financial depth and growth. This suggests that financial development is an important determinant of cross-country growth differences. More recent research by Beck and Levine (2001) on the impact of stock markets and banks on economic growth also found that stock markets and banks positively influence economic growth.

METHODOLOGY

Hypotheses

Based on the preceding review, the following hypotheses are generated:

> H_1: There is a positive relationship between financial market development and savings.
> H_{1a}: There is causal relationship from financial market development to savings.
> H_2 : There is a positive relationship between economic growth and savings.
> H_{2a}: There is a causal relationship from economic growth to savings.
> H_3 : There is a positive relationship between economic growth and financial market development
> H_{3a}: There is a causal relationship from economic growth to financial market development.

Data

This research uses secondary data for Malaysia for the period 1971 to 2000. The savings data is sourced from the Bank Negara Malaysia's *Annual Report*. However, the data is only available for Gross Private Savings from 1978 onwards. The stock market data is taken from Kuala Lumpur Stock Exchange. The market capitalization data is available only from 1980 onwards, while the total value traded is available since 1971. However, note that the figure for 1971 to 1972 is from the Stock Exchange of Malaysia and Singapore as the Kuala Lumpur Stock Exchange was only established in 1973. The rest of the data are sourced from the *International Financial Statistics Yearbook 2001*, published by the International Monetary Fund.

We use three measures as proxies for financial market development, as suggested by Bonser-Neal and Dewenter(1999):

1) The ratio of market capitalization to nominal GDP (MktCap/GDP) which provides an indication of the overall market size, one indicator of market development. Smaller ratio may indicate fewer opportunities for raising capital via stock market and less ability for risk diversification,
2) The ratio of total value traded to GDP (ValTrad/ GDP) which provides an indication of liquidity of the market relative to the size of the economy. Higher ratio means that the market trading is a significant fraction of the economy and should be associated with higher levels of market development.
3) The ratio of total value traded relative to market capitalization (ValTrad/MktCap), also known as the turnover ratio which measures the liquidity of the market. Higher values indicate higher liquidity and generally associated with higher levels of market development.

As recommended by Bonser-Neal and Dewenter (1999), gross private savings will be used as a measure of savings for this study. As for economic growth, two measures are used: 1) real per capita GDP growth, 2) real GDP growth in 1995 prices. Real growth rate is used because it removes the effect of inflation from nominal GDP and calculates the GDP in constant prices.

The Test

To test hypotheses H_1, H_2, and H_3, correlation tests are carried out. The correlation coefficient is given by

$$\rho(x,y) = \frac{Cov\ (x,y)}{\sigma_x \sigma_y} \tag{1}$$

where σ_x and σ_y is the standard deviation of x and y respectively, and x and y are the variables of interest described above.

As the direction of the association between any pair of the variable is not yet known, we rule out the use of regression tests. Instead, we use Granger causality to test H_{1a}, H_{2a} and H_{3a}. The essence of Granger's concept of causality is that X causes Y if taking account of past values of X leads to improved predictions for Y. As suggested by Pindyck and Rubinfeld (1991), to test whether X causes Y, first, a test of null hypothesis that "X does not cause Y" is done by running two regressions:

$$\textit{Unrestricted regression:} \qquad Y = \sum_{I=1}^{m} \alpha_i Y_{t-i} + \sum_{I=1}^{m} \beta_i X_{t-i} + \varepsilon_t \tag{2}$$

$$\textit{Restricted regression:} \qquad Y = \sum_{I=1} \alpha_i Y_{t-i} + \varepsilon_t \tag{3}$$

where X and Y are the variables of interest, and the subscripts t and t-i denote the current and lagged values. The sum of squared residuals from each regression is used to calculate an F statistic and test whether the group of coefficients $\beta_1, \beta_2 \ldots \beta_m$ are significantly different from zero. If they are, we can reject the hypothesis that "X does not cause Y". Secondly, to test the null hypothesis that "Y does not cause X", the same regressions above are run, but switching X and Y, and testing whether lagged values of Y are significantly different from zero. In order to conclude that X causes Y, we must reject the hypothesis that "X does not cause Y", and accept the hypothesis that "Y does not cause X". The number of lags, m, in these regressions is limited to two due to sample size limitations.

To test hypothesis H_{1a}, three Granger causality tests will be done: Firstly, between the Market Capitalization/Nominal GDP ratio ($X = \%$ MktCap/GDP) and Gross Private Savings ($Y = \%$ GPS/GDP), secondly, between the Value Traded/Nominal GDP ratio ($X = \%$ValTrad/GDP) and Gross Private Savings ($Y = \%$ GPS/GDP), and finally, between the Value Traded/Market Capitalization ratio ($X = \%$ ValTrad/MktCap) and Gross Private Savings ($Y = \%$ GPS/GDP).

To test hypothesis H_{2a}, two Granger causality tests are run between real GDP growth ($X = \%$ Real GDP) and Gross Private Savings ($Y = \%$ GPS/GDP), and between real per capita GDP growth ($X = \%$ Per capita GDP) and Gross Private Savings ($Y = \%$GPS/GDP).
For hypothesis H_{3a}, six Granger causality tests are conducted between:

We use the Durbin-Watson (DW) test to check if there exists serious serial correlation problems. We also use the autocorrelation function to test whether or not the series are stationary. For stationary series, the autocorrelation function (ACF) drops off as k, the number of lags, becomes large. If the series is non-stationary, we will difference them. To test for random walk, the Dickey-Fuller unit root test is used. Suppose a variable the variable of interest Y_t, is described as

$$Y_t = \alpha + \beta t + \rho\ Y_{t-1} + \lambda_1 \Delta Y_{t-1} + \varepsilon_t \tag{4}$$

where $\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$.

Using OLS, we first run the unrestricted regression,

$$Y - Y_{t-1} = \alpha + \beta t + (\rho-1)\ Y_{t-1} + \lambda_1 \Delta Y_{t-1} \tag{5}$$

and then the restricted regression,

$$Y - Y_{t-1} = \alpha + \lambda_1 \Delta Y_{t-1} \quad . \tag{6}$$

Then, we calculate the standard F ratio to test whether the restrictions ($\beta=0$, $\rho=1$) hold. This ratio is checked against the distributions tabulated by Dickey and Fuller, and these critical values are larger than the standard F table. The F statistic is calculated as below:

$$F = (N\text{-}k) \frac{ESS_R - ESS_{UR}}{q\,(ESS_{UR})} \tag{7}$$

where ESS_R and ESS_{UR} are the sums of squared residuals in the restricted and unrestricted regressions, respectively; N is the number of observations; k is the number of estimated parameters in the unrestricted regression; and q is the number of parameter restrictions. This statistic is distributed as F (q, $N\text{-}k$). In our study, Y_t can be any of the three stock market development indicator, gross private savings or the two economic growth measures.

RESULTS

Results presented in Table 1 show that the three financial market development indicators show no significant relationship with the savings variable, and the savings variable shows no significant relationship with the economic growth variables. However, correlation tests between the financial market development indicators and economic growth variables revealed a significant relationship between the Value Traded/Market Capitalization ratio and both the real GDP growth and real per capita GDP growth variable. For detailed results, refer Appendix 4. The correlation between the % ValTrd/MrktCap and % Real GDP revealed a correlation coefficient of 0.50, which is significant at 5 percent level, while the correlation between % ValTrd/MrktCap and % Per capita GDP gives us a correlation coefficient of 0.49 which is significant at 5 percent level.

Table 1: Summary of the Correlation Tests

Variables	Correlation Coefficient
% MrktCap/GDP and % GPS/GDP	-0.09
% ValTrd/GDP % and % GPS/GDP	-0.22
% ValTrd/MrktCap and % GPS/GDP	-0.17
% GPS/GDP and % Real GDP	-0.16
% GPS/GDP and % Per capita GDP	-0.17
% MrktCap/GDP and % Real GDP	-0.00
% MrktCap/GDP and % Per capita GDP	-0.02
% ValTrd/GDP and % Real GDP	0.05
% ValTrd/GDP and % Per capita GDP	0.06
% ValTrd/MrktCap and % Real GDP	0.50 *
% ValTrd/MrktCap and % Per capita GDP	0.49*

Correlation is significant at the .05 levels

The autocorrelation function is also plotted out, and can be used to test whether or not a series is stationary. If ρ_k does not fall off quickly as k increases, this is an indication of nonstationarity. From Figure 1 and Figure 2 of the autocorrelation function, it is observed that ρ_k falls off quickly as the number of lag, k increases. The Dickey-Fuller test for stationarity further confirms the result. From the Dickey-Fuller test, the F statistic of 25.17 for real GDP growth and 32.82 for Value Traded/Market Capitalization ratio as per Table 2 leads us to reject the hypothesis of random walk, which means that the time series does not follow a random walk.

Figure 1: Autocorrelation Function of Real GDP Growth Rate

Real GDP Growth
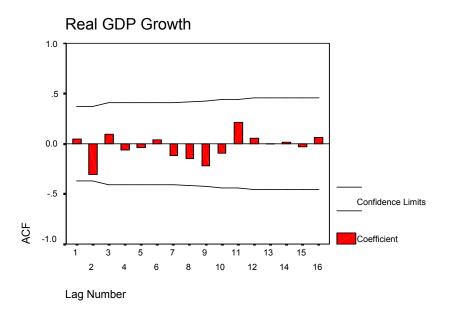
Figure 2: Autocorrelation Function of % Change in Value Traded/Market Capitalization ratio

Va'Trd/MCap % Change
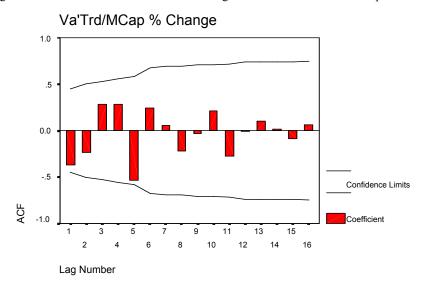
Table 2: Dickey-Fuller Test

	F-Statistic
Real GDP Growth Rate	25.17
% Change in Value Traded/Market Capitalization ratio	32.82

After confirming the goodness of the data, a Granger causality test is carried out on the variables which revealed significant relationships. Since there is significant relationship between both real GDP growth and real per capita GDP growth with the percentage change in the Value Traded/ Market Capitalization ratio, further test was carried out using only the real GDP growth. The test revealed that financial market development with the Value Traded/Market Capitalization ratio as proxy Granger causes economic growth. The result is summarized in Table 3.

Table 3: Granger causality test between Real GDP Growth and Value Traded/Market Capitalization Ratio

Null Hypothesis	F-Statistic (Data at level)	F-Statistic (After First-Differencing)
H$_{3a}$(1a) Financial market development does not Granger cause economic growth (Lag = 1)	36.49*	22.71**
H$_{3a}$(1b) Economic growth does not Granger cause financial market development (Lag = 1)	0.08	0.40
H$_{3a}$(2a) Financial market development does not Granger cause economic growth (Lag = 2)	17.40*	24.76**
H$_{3a}$(2b) Economic growth does not Granger cause financial market development (Lag = 2)	0.20	0.16

* Significant at 5 percent level

For the first test that financial market development does not Granger cause economic growth (data at level), the F-statistic of 36.49 in **H$_{3a}$ (1a)** is significantly different from zero, so the hypothesis that financial market development does not Granger cause economic growth is rejected. From the second test on **H$_{3a}$(1b)** where we switch the two variables, the F-statistic of 0.08 is not significantly different from zero, so the second hypothesis is accepted. The rejection of **H$_{3a}$(1a)** and acceptance of **H$_{3a}$(1b)** leads us to conclude that financial market development Granger causes economic growth. The same rationale is used for the Granger causality test using lagged value of 2 in **H$_{3a}$(2a)** and **H$_{3a}$(2b)**. From the above, we can see that the tests carried out with lag 1 and 2 revealed the same results.

Further tests carried out with the time series data after first-differencing also revealed the same result, using lag 1 and lag 2 values. In summary, the Granger causality test revealed that economic growth as proxied by GDP growth is influenced by past values of financial market development as proxied by Value Traded/Market Capitalization ratio.

DISCUSSION OF THE RESULTS

The relationship between financial market development and savings

The results that arise from the analysis between financial market development and savings is consistent with the findings by Bonser-Neal and Dewenter's (1999), and Levine and Zervos (1996, 1998) that a growing or deepening stock market will not be necessarily associated with higher saving rates.

Although theories suggest that liberalization and expansion of the stock market would allow for more efficient reallocation of resources leading to higher rate of return on savings, these effects will depend on the strength of the income and substitution effects. The substitution effect may increase savings as the increase in the rate of return makes current consumption more expensive. As a result, individuals may defer their current consumption thereby increasing savings. However, this increase in the rate of return also increases wealth, which in turn increases current consumption and reduces savings (the income effect). It should be noted, however, that some studies did find a positive relationship, for instances, Dornbusch and Reynoso (1989) and Dayal-Gulati and Thimann (1997). However, they use different measure for financial deepening.

The Malaysian private saving rates remained at a fairly high level even when the stock market is down, suggesting that other factors affect savings as well, and the net effect will depend on the strength of each factor. In fact, the development of the Malaysian stock market has been more to assist the private sector to secure funds for their expansion programs. This will positively influence growth. However, this study implies that the channel through which the development of the stock market spurs growth is not through savings.

We therefore reject H$_1$ that there is a positive relationship between financial market development and savings. Hypothesis H$_{1a}$ was not tested since hypothesis H$_1$ was rejected.

The relationship between savings and economic growth

The relationship between savings and economic growth has always been subject to a lot of debate. This is because the effect on savings can go either way due to the income and substitution effect. Furthermore, mere increase in savings will not lead to economic growth unless the savings is productively utilized.

In the period after the mid-1980s recession, Malaysia actively promoted private sector growth and market liberalization in line with the Vision 2020 as envisioned by our Prime Minister under the National Development Policy to become a "developed nation" by the year 2020. High savings provide the funds needed for the country's expansion. In essence, the availability of funds to take advantage of the good investment opportunities aided the economic growth. Without good investment opportunities, low savings may be more beneficial as they encourage higher consumption that in turn spurs growth. For example, the high savings rate in Japan did not stimulate economic growth, more likely due to poor long-run growth prospects.

Furthermore, Malaysia's private saving rates remained high even during economic downturns. For example, during the 1985 recession, even though the real GDP dropped by 8.41% in 1986, the gross private savings rate as a percentage of GDP actually increased from 12.9 percent in 1985 to 19.7 percent in 1986. This suggests that factors other than economic growth affect savings, such as the precautionary motive, the degree of risk aversion, the personal motive for saving and the demographic factor. According to the life-cycle hypothesis, the young tends to save, while the old dissaves. Malaysia's population structure has matured over the past two decades. The percentage of population in the 15-64 age group has risen from 57 percent in 1980 to 63 percent in 2001. This change in demographic in favor of the working age population positively influences savings.

Another factor to consider is that while the savings rate is high, the rise of the Malaysian economy has been greatly aided by the influx of foreign direct investment (FDI) as can be seen by the number of multinational companies (MNCs) setting up factories in Malaysia. One good example is the number of MNCs in tbe Bayan Lepas Free Trade Zone in Penang. While our savings rate remains high, it is in fact not sufficient to fund the country's rapid expansion, and the gap is met by FDI. Claus *et al* (2001) said that promoting growth alone would not justify the intervention to raise savings as a country with strong fundamentals will have ready access to foreign savings.

Moreover, the income and substitution effect makes it hard to see the actual effect of savings on economic growth. Higher rate of returns on savings possible during the period of economic growth makes current consumption more expensive, thereby increasing savings (the substitution effect). However, since the 1998 crises, the rate of return on savings has been low and performance of the KLSE was dismal, but in the absence of good investment opportunities savings rate remained high by world standards. This shows that higher rate of return is not the only factor to consider in determining how much to save.

Therefore, it is not surprising that this study found the link between savings and growth to be insignificant. This implies that many factors other than economic growth affect the Malaysian private saving rates. In this instance, we reject H_2 that there is a positive relationship between savings and economic growth. Due to the rejection of H_2, hypothesis H_{2a} was not tested.

The relationship between financial market development and economic growth

From the statistical tests conducted, it is found that financial market development has a positive effect on economic growth using only the Value Traded/Market Capitalization ratio, whereas insignificant relationships were found using the Market Capitalization/Nominal GDP ratio and Value Traded/nominal GDP ratio. This suggests that as the stock market increases in liquidity as measured by Value Traded/Market Capitalization ratio, the stronger is the effect on economic growth. Therefore, a better measure of the effect of stock market development on economic growth is the liquidity of the market, and not the market size itself as measured by Market Capitalization/Nominal GDP or the liquidity of the market relative to the economy as measured by Value Traded/Nominal GDP ratio.

According to Bonser-Neal and Dewenter (1999), the three measures of stock market development need not all move together as a market may be small but still has high Value Traded/Market Capitalization ratio, indicating high liquidity in the market. On the other hand, a market may be big in size relative to the economy but if the shares are not frequently traded, then the Value Traded/Market Capitalization may be low. In explaining the rationale of using three different measure of stock market development, Levine and Zervos (1996) said that high turnover is often used as an indicator of low transaction costs. A large stock market is not necessarily a liquid market; large but inactive market will have large market capitalization ratio but small turnover ratio. They go on to say that tiny liquid market does not imply that agents can cheaply, quickly and confidently trade ownership

claims of a large percentage of the economy's productive technologies. One of the pitfalls of the value traded ratio is that if the market anticipates large profits, stock prices will rise which in turn increase the value of stock transactions and therefore the value traded ratio. The liquidity indicator would also rise without a rise in the number of transactions or a fall in transaction costs. Since the price effect influences both indicators, both measures are used. The turnover measure, on the other hand, is not affected by stock price since stock price enters the numerator and denominator of the turnover ratio. A positive and robust turnover ratio associated with economic growth implies that the price effect is not dominating the relationship between liquidity and long-run economic growth.

For example, during the Asian financial crises, the drop in turnover as measured by Value Traded/Market Capitalization ratio in Malaysia is very drastic while the drop in market size ratio is not as drastic. That means that although the size of the stock market is relatively large, the liquidity of the market is low. Many companies are still listed in the Kuala Lumpur Stock Exchange, but the shares are not actively traded. Malaysia is struggling to recover from the crises. This suggests that in order to analyze the effect on economic growth, a better measure of stock market development in Malaysia is the Value Traded/Market Capitalization ratio which measures market liquidity instead of size.

Levine and Zervos' (1996) also found that stock market liquidity are positively correlated with contemporaneous and future rates of economic growth. Taken as a whole, the result of the hypothesis testing of H_1 and H_3 is consistent with Levine and Zervos' (1996) findings. They found that stock market liquidity is unrelated to private saving rates, consistent with their findings that stock market liquidity is positively related to physical capital accumulation. This implies that the link from stock market development to economic growth is not through savings. Higher stock market liquidity merely reallocates the savings towards more productive uses, while saving rates can remain unchanged. Thus saving rates are uncorrelated with liquidity while stock market liquidity boosts the rate of capital accumulation. International capital flows further weaken the link between domestic saving rates and capital formation. However, their results do not consider the question of causality.

Testing for H_{3a} using Granger's causality test found a causal relationship from financial market development as proxied by the Value Traded/Market Capitalization ratio to economic growth. This result remains unchanged with lagged values of 1 and 2, and also with differenced time series data. This relationship contradicts the findings by Habibullah (1999) that the causal relationship is from economic growth to financial development. However, it should be noted that Habibullah uses the ratio of broad money supply, M2, to Gross National Product (M2/GNP) as proxy for financial development. The fact that Habibullah found a causal relationship from economic growth to financial market development using the financial proxy while this study found a causal relationship from financial market development to economic growth using the stock market proxy suggests that stock market development Granger causes economic growth, and economic growth in turn spurs development in the finance and banking sector. An important implication is that different measures of financial market development give different direction of causation.

The significant result obtained is consistent with Filer *et al's* (1999) findings that there is a positive and causal relationship from stock market development to economic growth using Granger-causality test, in support of the financial-led hypothesis. Moreover, their measure of stock market development is in line with the measures used in this analysis. They used the turnover velocity (sales over market capitalization) as one of the indicator of stock market development and found that a higher turnover velocity Granger-causes economic growth. According to them, an active stock market is crucial in reallocating capital to high value uses in developing countries.

The rise in the Malaysian economy is greatly aided by the development of the stock market. The stock market continues to be an important source of financing for the private sector. Without a liquid stock market where shares can be easily traded, the domestic private sector would find it hard to raise enough capital to expand their business. In Malaysia, among the capital markets, the stock market is still the most liquid market and remains a popular alternative for domestic businesses to raise funds, other than Private Debt Securities. The high liquidity in the market has greatly aided the economic growth, providing the funds needed for the private sectors' expansion, in line with the government's plan to reduce the country's over-dependence on external borrowings. In fact, for the first seven months in 2002, the total funds raised by the private sector through new share issues totaled RM9.62 billion.

The results above suggest that for Malaysia, there is no significant link between financial market development and gross private savings. The same result is obtained for gross private savings and economic growth. The results imply that the link from financial market development to economic growth is not through savings, but through other channels. However, this does not mean that savings is irrelevant for economic growth. It may be that due to the offsetting income and substitution effect, and other factors that affect savings, the results of the correlation test did not reveal significant relationship between the two variables.

On the other hand, this study found that financial market development, as proxied by Value Traded/Market Capitalization ratio has a significant relationship with economic growth, and the causal relationship is from financial market development to economic growth. This is in support of the financial-led hypothesis proposed by some researchers. Moreover, results also suggest that the direction of causal relationship between financial market development and economic growth is dependent on the proxy used for financial market development.

In summary, H_1 and H_2 are rejected while H_3 is accepted. H_{1a} and H_{2a} are not tested as the correlation tests revealed insignificant results. H_{3a} is rejected, not because there is no causal relationship, but because the causal relationship is from financial market development to economic growth and not the other way around as proposed in the hypothesis development section earlier.

CONCLUSION

Economists have tried to analyze the factors that cause economies to grow at different rates, from analyzing the policy variables such as fiscal and monetary policies, financial market development and stability, to nonpolicy variables such as demographics and per capita income economic growth. Two of the factors that received considerable attention are the role of financial market and savings in predicting economic growth.

This study finds that financial market development has no effect on savings in Malaysia using longer time series data than those used by Bonser-Neal and Dewenter in 1999. In addition, the relationship between savings and economic growth is also insignificant. However, results of this study have highlighted the link between financial market development as measured by the market turnover (Value Traded/Market Capitalization) ratio with economic growth. Is there any relationship between financial market development and economic growth? The answer is yes, but only using Value Traded/Market Capitalization ratio as proxy. Although this paper, in limiting the research to Malaysian data, may not solve the ongoing debate and theoretical ambiguities relating to this subject, it is hoped that the knowledge gained will provide additional insights into the subject that is close to the heart of any nation, that of economic growth.

REFERENCES

Andersson, Björn (1999). On the Causality between Saving and Growth: Long- and Short run Dynamics and Country Heterogeneity, Working Paper 1999:18. Department of Economics, Uppsala University.

Azman-Saini, W.N.W., Habibullah, M.S. and Azali, M. (2000). The Relevance of Financial Development for Economic Growth: A Bounds Test Approach, *Pertanika Journal of Social Science and Humanities,* 8(1)51-57.

Bank Negara Malaysia (1996), *Bank Negara Annual Report 1996,* Kuala Lumpur, Bank Negara Malaysia.

Beck, Thorsten and Levine, Ross (2001*).* Stock Markets, Banks and Growth: Correlation or Causality? World Bank Working Paper No.2670, Washington, DC.

Bisat, Amer, El-Erian, Mohamed A., and Helbling, Thomas (1997). Growth, Investment and Savings in the Arab Economies, IMF Working Paper No. WP 97/85, International Monetary Fund.

Bonser-Neal, Catherine and Dewenter, Kathryn L. (1999). Does Financial Market Development Stimulate Savings? Evidence from Emerging Stock Markets, *Contemporary Economic Policy,* 17 (3), 370.

Claus, Iris, Haugh, David, Scobie, Grant, and Törnquist, Jonas (2001*).* Saving and Growth in an Open Economy, *Treasury Working Paper 01/32,* New Zealand Treasury.

Dayal-Gulati, Anuradha and Thimann, Christian (1997). Saving in Southeast Asia and Latin America Compared: Searching for Policy Lessons, IMF Working Paper, 97/110, International Monetary Fund.

Demirguc-Kunt, Asli and Levine, Ross (1996). Stock Market Development and Financial Intermediaries: Stylized Facts, World Bank Economic Review (March), Washington, DC.

Dickey, D.A. and Fuller, W.A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root, *Econometrica,* 49, 1057-1072.

Dornbusch, Rudiger and Reynoso, Alejandro (1989, May). Financial Factors in Economic Development, *AEA Papers and Proceedings*, 79(2), 204-209.

Filer, Randall K., Hanousek, Jan and Campos, Nauro F. (1999). Do Stock Markets Promote Economic Growth? Working Paper No. 267*,* William Davidson Institute, University of Michigan.

Formaini, Robert L. and McKenzie, Richard B. (2000). Where Have all the Savings Gone? *Independent Review*, 5(3), 409-415.

Granger, C.W.J. (1969). Investigating Causal Relations by Econometric Models and Cross-Spectral Methods, *Econometrica,* 37, 424-438.

Habibullah, Muzafar Shah (1999). Financial Development and Economic Growth in Asian Countries: Testing the Financial-led Hypothesis. *Savings and Development,* 23(3), 279-291.

Habibullah, Muzafar Shah and Smith, Peter (1997). Financial Liberalization and Economic Development: Lessons from ASEAN Countries, *Journal of Asian Business,* 13(3), 69-97.

Jacobson, Tor, Lindh, Thomas, and Warne, Anders (1998). Growth, Savings, Financial Markets and Markov Switching Regimes, Central Bank of Sweden Working Paper Series No.69, Sweden.

Jappelli, Tullio and Pagano, Marco (1998). The Determinants of Saving: Lessons from Italy, Centre for Studies in Economics and Finance Working Paper No.1, Department of Economics, Universită di Salerno, Italy.

Khan, Mohsin S. and Senhadji, Abdelhak S. (2000). Financial Development and Economic Growth : An Overview, IMF Working Paper No. 00/209, International Monetary Fund.

Levine, Ross (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature,* 35(2), 688-726.

Levine, Ross and Zervos, Sara (1996a). Stock Markets, Banks and Economic Growth, World Bank Policy Research Working Paper No. 1690, Washington, DC.

Levine, Ross and Zervos, Sara (1998). Stock Markets, Banks and Economic Growth, *American Economic Review,* 88(3), 537-558.

Levine, Ross and Zervos, Sara (1996). Stock Market Development and Long-run Growth, World Bank Policy Research Working Paper No. 1582, Washington, DC.

Lin, See Yan (1992). Malaysia: The Savings-Investment Gap, Financing Needs and Capital Market Development, *Malaysian Management Review,* 27(4), 26-53.

Lingle, Christopher (2000). High Savings Rates and Asia's Economic Crises. *Ideas on Liberty*; Irvington-on-Hudson, 50(12), 30-31.

Loayza, Norman, Schmidt-Hebbel, Klaus and Servén, Luis (2000). What Drives Private Saving Around the World? World Bank Policy Research Working Paper No.2309, Washington, DC.

Loayza, Norman, Schmidt-Hebbel, Klaus and Servén, Luis (2000a). Saving in Developing Countries : An Overview. *The World Bank Economic Review*, 14 (3), 393.

Mauri, Arnaldo and Calamanti, Andrea (1984). A Note on the Role of Securities Markets is Developing Countries in Savings Mobilization. Report of the Second International Symposium on the Mobilization of Personal Savings in Developing Countries-Kuala Lumpur, Malaysia 15-21 March 1982.

Műhleisen, Martin (1997). Improving India's Saving Performance, IMF Working Paper No.97/4, International Monetary Fund.

Is 'East Asian Community' an Ephemeral Dream or Realistic Possibility?
An Empirical Investigation of Income Convergence among Candidates' Economies

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ABSTRACT

This study attempts to address the issue of income convergence among candidates' economies of 'East Asian community'-China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand, using a more robust procedure to ensure reliable inferences and policy prescriptions. This line of inquiry is highly relevant since the benefits from economic integration are greater for countries that have similar levels of income and economic development. Though the authors share the optimism of other scholars that the 'East Asian community' is a realistic possibility, the findings from our empirical investigation using *KSS* non-linear unit root test reveal that the income disparities between Japan and five of the candidates' economies-China, Indonesia, Malaysia, the Philippines and Thailand, should be on top of the agenda when formulating policies of such regional integration.

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INTRODUCTION

The geographical expression of East Asia, consists of Japan, China (includes Hong Kong), South Korea and the ten members of ASEAN (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam), has generated much talk not only among academicians but also in the political circle, especially in regards to the emergence of new regionalism in East Asia that represents a clear break from the region's strong history of multilateralism. For instance, in response to the 1997 Asian financial crisis, academicians have urged for closer regional economic co-operation and integration in East Asia (see, for example, Dutta, 2002; Harvie and Lee, 2002; Yu, 2003). However, opinions provided by scholars are only helpful in the formation of ideas, while it is the policymakers who make these ideas become reality. In this regard, the political commitment for the pursuit of closer East Asian cooperation is evidenced from the ASEAN +3 (China, Japan and South Korea) process, Japan's Initiative for Development in East Asia (IDEA), the establishment of East Asia Vision Group (EAVG) and East Asia Study Group (EASG). The recent idea of regionalism in East Asia is in fact not something new. Back in year 1990, Mahathir Mohamad, the former Prime Minister of Malaysia, has proposed the formation of the East Asian Economic Group (EAEG). However, due to strong objection of the United States and the lukewarm response from Japan and South Korea, the EAEG proposal was not pursued.

The important question is why these East Asian countries have changed their course of direction towards pursuing such institutionalized cooperation. This is partly due to the success of European Union (EU) and North American Free Trade Area (NAFTA) where efforts of cooperation and integration have been progressing at a rapid pace. Furthermore, the enlargement of the EU and growing pan-American moves to increase free trade arrangements have been seen as a threat by these East Asian countries to multilateral trading system. For instance, efforts have been undertaken to expand NAFTA into the proposed Free Trade Areas of the Americas (FTAA) that includes the entire American continent except Cuba. On the other hand, the EU opens its door to 10 new members (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and

Slovenia) on 1 May 2004, increasing the number of the EU member nations from 15 to 25. Alarmed by the growing competition from EU, NAFTA and other mushrooming free trade areas in the world, a nascent sense of an East Asian community is emerging as these countries realize that they must cooperate to tackle common challenges in this increasingly borderless interdependent world. In fact, Dutta (2003) highlighted that globalization with regionalization may be the map of the world economy. The World Bank, at its conference in Germany on 5-8 December 1999, has added substantive input to the concept of economic regionalization based on a map-of-the-world view of a region, by grouping the developing economies into seven regions of East Asia, South Asia, Central and South America, Africa, Middle East, Southern Europe, and Russia. It seems that there is no alternative to regionalism in this new millennium of globalization.

The second factor is the economic potential of growth for these East Asian countries, with a combined population of about 2 billion. This is approximate one third of the world's population, and about 150% larger than the combined population of NAFTA and EU. In terms of economic size, the combined GDP of East Asia is about two-third of the U.S., and nearly nine-tenth of the EU. However, with a huge market size to be tapped, the economic size of East Asia could soon surpass that of NAFTA or EU. Furthermore, Yu (2003) argued that these East Asian economies possess abundant natural resources and rich sources of manpower with hard-working spirit. If these natural resources can be effectively deployed, and the manpower well educated, these two factors can provide greater comparative advantages and greater levels of competitiveness with other regions of the world.

The third factor is the increasing interdependence among these East Asian economies through trade and investment. In recent years, East Asia has been coming together in almost imperceptible ways, slowly but steadily. In this regard, the East Asian economies have often been likened to flying geese, with Japan leading the flock and the newly industrialized countries and then the less developed ones following in that order (Kojima, 2000). As noted by Yu (2003: 725): "*Japan, as the second richest country in the world, was the leader of the flying geese paradigm in East Asia, not only because Japan was the first Asian country to complete its industrialization, but also because it has provided machinery, equipment and semi-manufactured products to the rest of the East Asian economies, and has undertaken major investment throughout the region*". Historically, investments from the more developed countries have nourished the growth of the less developed ones and helped pull them up the ladder. This process involves not only markets and capital, but also services, the transfer of technology, and the development of human skills. Unless something happens to break it up, the continuation of this process can hold great potential for further economic integration in East Asia. The success of the East Asian flying geese model of development is evidenced from the region's high rates of economic growth, which is considered as an economic miracle that has attracted wide academic and policy interests. World Bank (1993) documented this as the "*East Asian Miracle*". In particular, the prosperous economies of Hong Kong, South Korea, Singapore and Taiwan has earned them the tag of Asian '*four little dragons*' economies and have been hailed as the models of achievement for other emerging economies to emulate. While the East Asian '*little dragons*' grew the fastest with more than 8% per year, the performance of the other four Southeast Asian economies (the four '*little tigers*'), namely Indonesia, Malaysia, the Philippines and Thailand, are equally impressive. Even the poorest economy of China and Vietnam too have had an average annual growth rate in excess of 5 percent in the last two or more decades.

There is a pragmatic judgment in waiting for things to evolve in their due course. In this regard, the 1997 Asian Financial Crisis may have operated as a trigger or an occasion to prompt a sense of immediacy, which explains the timing of the recent movement towards regionalism in East Asia. The macroeconomic performance and prospects of the East Asian region have changed dramatically since the outset of the Asian financial crisis in July 1997. East Asia plunged from being the region that exhibited the highest average real GDP growth rate of all regions in the world economy to the region in which several countries registered negative growth in real GDP in 1998- Cambodia, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore, and Thailand. Some of these countries had to go the International Monetary Fund (IMF) for large bailout loan programs (Korea, Thailand and Indonesia). All in a sudden, the Asian geese were no longer flying but lying sick on the ground. Hence, the crisis serves like a wake-up call for the rethinking of East Asia, not only as a geographic concept, but more strongly as a regional institutional arrangement.

During the ASEAN+3 Summit in 1998, South Korea's President Kim Dae Jung proposed the establishment of an expert panel, the East Asian Vision Group (EAVG), as the first step in exploring the possibility of forging a regional co-operation mechanism. This group discussed ways to develop the ASEAN+3 grouping into a regional co-operation forum. The EAVG submitted their reports entitled "*Towards an East Asian Community: Region of Peace, Prosperity and Progress*" in October 2001, with 57 recommendations covering cooperation in the areas of economic, financial, political and security, environmental, social and cultural, and institutional.

At the fourth ASEAN +3 Summit in Singapore in November 2000, which is one year before EAVG submit their report, President Kim Dae Jung's proposal to establish an official East Asia Study Group (EASG) was adopted. The EASG is an official group at the Senior Officials level, aiming to explore practical ways and means to deepen East Asian cooperation, and to assess the recommendations to be suggested by the EAVG. The EASG have submitted their reports in November 2002, with 26 concrete short-term and medium-to-long-term measures (17 of them are short-term measures, while the rest are medium-term and long-term measures) selected from the EAVG recommendations, to move East Asian cooperation significantly forward and eventually realize the vision of building a *bona fide* regional community of peace, prosperity and progress, known as the 'East Asian community'. The short-term measures that are relatively easier to implement include the formation of an East Asia Forum, an East Asia Business Council, a network of East Asia eminent intellectuals, and the promotion of East Asian studies. The long-term measures include the formation of an East Asia Free Trade Area and the evolution of the ASEAN +3 Summit into an East Asian Summit.

There are certainly many challenges in store for the realization of the vision of 'East Asian community', in view of the region's immense diversity- historical, cultural, ethnic, political, etc. However, the main objective of this paper is to address one critical issue that deserves urgent attention from these East Asian countries, as they aspire to achieve greater integration in the region. It is important to note that the disparities of income levels among candidates' economies have to be addressed when formulating policies of such regional integration, since the benefits from economic integration are greater for countries that have similar levels of income and economic development (see, for example, Robson, 1998; Park, 2000a). Even in the context of EU, income equality across members has been one of the central goals since the early days, and various policy measures have been introduced to help achieve this goal. One of the key policy measures is the setting up of Structural Funds. The main purpose is to improve the long-term growth prospects of the Union's less prosperous members, in an apparent fear that, should integration proceeds on its own, increasing returns and agglomeration effects would naturally prevail, causing poorer member countries to fall further behind. Reflecting this concern, most of the grants provided under this policy have been directed towards enhancing the region's human capital endowments and infrastructures, and the four less developed EU members (Spain, Portugal, Ireland and Greece) have been the main beneficiaries of this policy. In addition to that, before the admission of the ten new Central and Eastern European countries in May 2004, the EU-15 have implemented various programmes to assist these countries in the reconstruction of their economies so that they can adjust to the standards and competitive nature of the EU economy, and hence reap the benefits from such regional integration.

With the background, motivation and objective in place, this paper proceeds as follows: Section II provides a brief discussion on the issue of income convergence, with a focus on methodology to ensure robust results for drawing reliable policy prescriptions. This is followed by a description of the data and methodology employed in Section III and IV respectively. Subsequent section presents the empirical results as well as the analysis of the findings. Finally, concluding remarks are given at the end of the paper.

EMPIRICAL INVESTIGATION OF INCOME CONVERGENCE

The topic of income convergence has attracted substantial attention from researchers over the past few decades. The theoretical underpinnings of the convergence hypothesis are derived from Solow's (1956) neoclassical growth model, which postulated that differences in initial income do not have long term effects on growth with initially poorer economies are able to catch up with the richer economies. Most empirical tests of the convergence hypothesis utilized cross-sectional data to investigate the correlation between income differences and initial per capita income in cross-country and cross-regional studies, in which a negative correlation is taken as evidence of convergence. However, this approach has recently come under heavy criticism and many researchers resorted to time series tests in their empirical investigation. In particular, the Augmented Dickey-Fuller (ADF) unit root test is widely employed to look at the stationarity of cross-country per capita income differences. Unlike those cross-sectional studies, the time series evidence has not been very supportive of the convergence hypothesis. In this regard, Lee *et al*. (2004) provided excellent discussions on the limitations of cross-sectional approach, the reasons behind the inconsistent results from both approaches, and a review on the related literature in this body of growth studies.

The failure of the ADF unit root test to detect stationarity of income differences might be due to the low power of the test itself, especially when dealing with long time spans of data. Some authors suggested that the statistical power of ADF unit root test might be decreased by structural discontinuities problems such as the World Wars, technology and policy shocks, oil supply shocks and economic crisis. Specifically, Perron (1989) highlighted the possibility that a break in the deterministic trend could be interpreted as the existence of a unit root and could lead to failure to reject the null hypothesis of a unit root. Motivated by this concern, a number of previous studies have given attention to the possibility of structural discontinuities in the convergence process,

utilizing structural break tests such as those proposed by Perron (1989), Perron and Vogelsang (1992) and Zivot and Andrews (1992), in order to ensure a more robust results (see, for example, Carlino and Mills, 1993; Oxley and Greasley, 1995; Loewy and Papell, 1996; Li and Papell, 1999; Zhang *et al.*, 2001; Lee *et al.*, 2004).

However, this study offers an alternative explanation to the failure of ADF unit root test to support income convergence between countries. In particular, this study conjectures that the failure is due to the low power of the test against non-linearity in the data generating process of the real income series. In fact, the non-linear process can be considered as a general form that encompasses structural discontinuities in the convergence process addressed by those earlier studies cited above. With regards to the conventional ADF test, it is noteworthy to highlight that the test is build on the linear autoregressive AR(p) model that has become the fundamental of higher econometric analysis[1]. This assumption of linearity, which has been made as an approximation of the real world, is now found to be inappropriate, especially with the advancement of research methodology and computer technology. Liew *et al.* (2003) argued that estimating the linear AR(p) model, implicitly disregarding any possible non-linearity in the series under consideration, will yield a mis-specified model and thereby provide incorrect inferences and policy conclusions. Specifically, the authors (see also, Lim *et al.*, 2003; Lim and Liew, 2004) suggested employing formal linearity test as a diagnostic tool to determine the nature of the data generating process before any further empirical analysis. Linear model is valid only when formal linearity test result fails to provide evidence on the existence of non-linearity. In this regard, though the literature on financial data is far most voluminous, testing for non-linearity in macroeconomic time series such as the GDP is no lesser, for instance Scheinkman and LeBaron (1989), Potter (1995), Teräsvirta (1995), Gatti *et al.* (1998), Skalin and Teräsvirta (1999) and Öcal and Osborn (2000). More importantly, there has been increasing empirical evidence suggesting that the failure of ADF test might be due to the invalid maintained hypothesis of linearity. Specifically, Sarno (2001), Kapetanios *et al.* (2003) and Liew *et al.* (2004), among others, demonstrated the lack of power of the ADF test to reject a false null hypothesis of unit root when the true data generating process is non-linear[2]. In a recent related paper, Datta (2003) highlighted the possibility that the convergence process is non-linear and the assumption of 'structural stability' in standard time series tests would lead one to reject convergence under such situations. This is in line with earlier assertion by Durlauf (2001: 67) that the constant coefficient linear model assumptions made in standard growth analyses are not supported by the data.

Motivated by the above concern, this study attempts to address the issue of income convergence among candidates' economies-China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand, using a more robust procedure to ensure reliable inferences and policy prescriptions. Following the suggestions of Liew *et al.* (2003), Lim *et al.* (2003) and Lim and Liew (2004), this study employs formal linearity test as a diagnostic tool to determine the adequacy of the linear AR(p) model in characterizing the variable before any further application of this model in empirical analysis. In particular, the linearity nature of the income differences between Japan (target leader) and each of the East Asian countries is first investigated, using the standard linearity test (henceforth denoted as *LST* linearity test) first proposed by Luukkonen *et al.* (1988). If the linear AR(p) framework is found to be inadequate, this study proceeds with the newly developed non-linear unit root test (henceforth denoted as *KSS* non-linear unit root test) proposed by Kapetanios *et al.* (2003) to test the income convergence hypothesis. This is important, as pointed out by Liew *et al.* (2004), that the evidence of non-linearity does not necessarily imply non-linear stationary. It is worth highlighting that though there were previous empirical growth studies involving some of these East Asian countries (see for example, Park, 2000a, 2000b, 2003; Zhang, 2003; Lee *et al.*, 2004), the contribution of this paper is methodological. For instance, Park (2000a, 2000b, 2003) utilized Theil inequality indices, Zhang (2003) addressed the weaker notion of catching up using cross-sectional approach, while Lee *et al.* (2004) employed the ADF and structural break test constructed in the linear framework. In addition to that, unlike previous studies, the present one contributes direct policy input to the formation of 'East Asian community'.

THE DATA

The source of our data, real Gross Domestic Product (GDP) per capita for ten East Asian countries (China, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan and Thailand) is the Penn World Table (PWT). Similar data set has been employed by Lee *et al.* (2004). Taiwan is included in the sample as mainland China has never recognized the independence of the island, coupled with strong political support from the world that Taiwan is part of her territory. On the other hand, only the five core economies of ASEAN are included as Park (2000a) found that there exists wide income disparities between the core and the remaining

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[1] For instance, the nowadays most widely applied unit root (or stationary) test, the order of integration test, the Granger causality test and the cointegration test are all built on the basis of AR(p) model.
[2] Nevertheless, the Monte Carlo results of Sarno (2001) and Kapetanios *et al.* (2003) showed that the ADF test is robust when the true generating process is linear.

five periphery economies-Brunei Darussalam, Cambodia, Laos, Myanmar and Vietnam. The author argued that a more likely scenario is that of integration among the five core economies first, and subsequently bringing in the periphery economies as well into the integration process. In the context of East Asian, Dutta (2002) proposed the model of 3 plus 5, three economies of Northeast Asia (China, Japan and South Korea) and five in Southeast Asia (Indonesia, Malaysia, the Philippines, Singapore and Thailand), as a first step towards regionalization in East Asia.

The unique feature of PWT is that all economic variables are denominated in a common set of prices in a common currency so that real quantity comparisons can be made, both between countries and over time. This study is able to use the newly release PWT version 6 prepared by Heston, Summers and Aten (2001), in which the base year has been moved from 1985 in the earlier version of 5.6 to year 1996, providing us with a longer data span from 1960 to 1998. However, data in 1998 are not utilized because it appears likely that the Asian financial crisis will disrupt the growth patterns of these East Asian countries. However, it would be interesting for future study to assess the impact of the crisis on the convergence amongst these countries, when more data after the crisis is made available. As usual, prior to analysis, all the series are transformed into logarithm form.

Figure 1 provides a sketch of the important income indicators for the selected East Asian countries. The average growth rate of real GDP per capita in 1960-1997 is plotted on the vertical axis, while the logarithm of initial real GDP per capita in 1960 lies on the horizontal axis. As observed, the initial incomes in 1960 differ substantially across East Asia. The role of Japan as the lead country in the region is undisputable since it has higher initial real GDP per capita of US$4512 in PPP terms. With the spectacular growth rate achieved by other East Asian economies, it is interesting to investigate whether these countries are able to attain income convergence with the lead goose in the region.
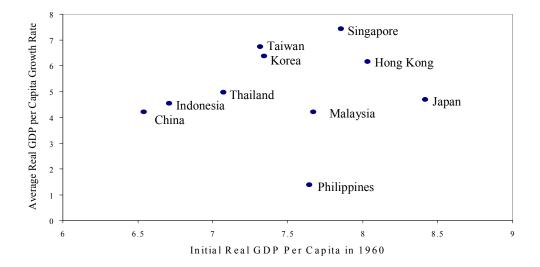
Figure 1:Average Real GDP Per Capita Growth Rate and Initial Real GDP Per Capita

Source: Penn World Table version 6.0

METHODOLOGY

This study first employs the *LST* linearity test proposed by Luukkonen *et al.* (1988) to determine the linearity nature of the income differences between Japan (target leader) and each of the East Asian countries. If the linear AR(*p*) framework is found to be inadequate, this study proceeds with the newly developed *KSS* (Kapetanios *et al.*, 2003) non-linear unit root test to empirically investigate the income convergence hypothesis. This is important, as pointed out by Liew *et al.* (2004), that the evidence of non-linearity does not necessarily imply non-linear stationary. However, if the null of linearity cannot be rejected by the *LST* linearity test, then there is no need to proceed with the *KSS* non-linear unit root test. In fact, the Monte Carlo results of Sarno (2001) and Kapetanios *et al.* (2003) showed that the ADF test is robust when the true generating process is linear. In this regard, the ADF test results reported in Lee *et al.* (2004) will be consulted for making inferences and policy prescriptions.

LST Linearity Test

This study adopts the Luukkonen *et al.* (1988) linearity test in the present context to determine whether the logarithm differences of real GDP per capita between two sample countries, $(\ln Y_{jt} - \ln Y_{At})$ exhibits linear or non-linear behaviour:

$$(\ln Y_{it} - \ln Y_{At}) = \alpha_0 + \sum_{j=0}^{2}\sum_{k=1}^{p}\alpha_{jk}(\ln Y_{it-k} - \ln Y_{At-k})(\ln Y_{it-k} - \ln Y_{At-k})^{j} +$$

$$\alpha_3(\ln Y_{it-d} - \ln Y_{At-d})^{3} + \omega_t \tag{1}$$

where α_0, α_{jk} ($j = 0, 1, 2; k = 1, …, p$) and α_3 are parameters to be estimated and under the null hypothesis, ω_t is the stochastic error term with zero mean and constant variance assumption, p stands for the autoregressive lag length whereas d is called the delay parameter. Note that p and d have to be determined empirically based on sample data, see Liew *et al.* (2003) in this regard.

Under linearity, the null hypothesis of $\alpha_{2k} = \alpha_3 = 0$ for all k, implying the absence of non-linearity, against the alternative hypothesis of the existence of a type of non-linearity known as Smooth Transition Autoregressive (STAR) process, see Luukkonen *et al.* (1988) and Teräsvirta (1994) for other details. The *F*-type test statistic is employed to accomplish this test.

KSS Non-linear Unit Root Test

Applying to the context of this study, the Kapetanois *et al.* (2003) non-linear unit root test enables us to detect the presence of non-stationarity against non-linear but globally stationary STAR process, which can be represented by:

$$\Delta(\ln Y_{it} - \ln Y_{At}) = \delta(\ln Y_{it-1} - \ln Y_{At-1})^{3} + \mu_t \tag{2}$$

or

$$\Delta(\ln Y_{it} - \ln Y_{At}) = \sum_{k=1}^{p}\beta_k\Delta(\ln Y_{it-k} - \ln Y_{At-k}) + \delta(\ln Y_{it-1} - \ln Y_{At-1})^{3} + \upsilon_t \tag{3}$$

where μ_t and υ_t are stochastic error terms each with zero mean and constant variance assumption.

Specifications (2) and (3) correspond to the conventional Dickey-Fuller (DF) and augmented Dickey-Fuller (ADF) unit root tests with no intercept and trend terms in the non-linear framework. Results of simulation study show that these non-linear unit root tests produce robust results if the data generating process of the series under study is in fact non-linear in nature (Kapetanois *et al.* 2003).

The null hypothesis of non-stationary series, $\mathrm{H}_0 : \delta = 0$ (implies divergence) against the alternative of $\mathrm{H}_1 : \delta > 0$ (implies income convergence) can be tested using the *t* statistics. For the brevity of reporting, the *t* statistics estimated from Equations (2) and (3) are reported as t_{KSS1} and t_{KSS2} respectively in Table 2 for $p = 8$, as was practised in Liew *et al.* (2004). However, as suggested in Kapetanois *et al.* (2003), the present study also conducts test of Equation (3) for $1 \leq p \leq 12$ and reports the maximum test statistics as t_{KSS3}. This measure is taken to ensure that the non-rejection of the null hypothesis of *KSS* test is not due to the restrictive assumption of fixing $p = 8$ *in priori*. All these *KSS* test statistics are to be compared with the same set of critical values simulated by Kapetanois *et al.* (2003) as conventional *t* critical values are no more applicable in this non-linear framework due to the asymptotically distribution of δ, which has been proven to be non-normal.

EMPIRICAL RESULTS

From Table 1, it is observed that the null hypothesis of linearity has been rejected by the F statistics at less than 1% significance level in all cases. This finding suggests that the data generating process of income differentials between Japan and all other East Asian economies under study cannot be taken as linear in nature. Hence, the conventional ADF test, which does not account for non-linearity, is no doubt inappropriate to be employed in our empirical investigation of the income convergence among candidates' economies for the formation of new regionalism in East Asia. As such, we turn to the results of the relevant *KSS* non-linear unit root test.

By the t_{KSS1} test statistics as reported in Table 2, the null hypothesis of non-stationary cannot be rejected in all cases even at 10% level. Nonetheless, the portmanteau Q statistics suggest that these test statistics should be interpreted with caution as the model's residuals are contaminated with serial autocorrelation in most cases. In such situation of serial correlation, the t_{KSS2} results should be consulted, as proven by Kapetanois *et al.* (2003) to be robust. Turning to the t_{KSS2} test results provide evidence of income convergence for Japan-Korea only. However, the results of t_{KSS3} test, which allows the computer programme to detect the optimal autoregressive lag p rather than fixing it *in priori*, reveal that Korea is not the only country in the region that has achieved the income convergence criterion. Instead, favourable evidence of income convergence is reported for three more countries-Hong Kong, Singapore and Taiwan. Overall, it can be concluded from this *KSS* test that China, Indonesia, Malaysia, the Philippines and Thailand exhibit divergence behaviour with respect to Japan's income, whereas Hong Kong, Korea, Singapore and Taiwan show otherwise.

Table 1 *LST* Linearity Test Results

Country	p	d	F	*msv*	Q
China	1	12	21.138	0.001	0.137
Hong Kong	1	6	10.422	0.003	0.392
Indonesia	1	8	23.021	0.000	0.583
Korea	1	12	21.586	0.000	0.786
Malaysia	1	12	15.061	0.000	0.210
Philippines	1	6	6.018	0.028	0.751
Singapore	1	11	28.388	0.000	0.927
Taiwan	1	12	22.736	0.000	0.859
Thailand	1	9	19.474	0.000	0.802

Notes: The marginal significance value of the F statistic is denoted as *msv*. Ljung-Box portmanteau statistic is applied to test for the presence of serial correlation up to 20 lags and its marginal significance value is denoted as Q. The optimal autoregressive lag length p is determined by inspecting the PACF of the series. The optimal delay parameter d is chosen from the one that minimizes the marginal significance value of the F test statistic.

Table 2 *KSS* Non-linear Test Results for Income Convergence Hypothesis

Country	t_{KSS1}	Q	t_{KSS2}	Q	t_{KSS3}	Q	Optimum lag p
China	0.015	0.005	−1.513	0.509	−1.942	0.509	12
Hong Kong	−1.142	0.433	−1.835	0.435	−3.094[b]	0.435	10
Indonesia	−0.139	0.000	−1.249	0.556	−2.212	0.556	12
Korea	−0.940	0.001	−2.703[a]	0.731	−2.879[a]	0.731	12
Malaysia	−0.194	0.008	−0.805	0.905	−0.839	0.983	6
Philippines	2.036	0.014	0.255	0.927	1.454	0.927	10
Singapore	−1.553	0.857	−1.378	0.558	−2.992[b]	0.558	5
Taiwan	−1.329	0.000	−2.488	0.996	−2.853[a]	0.997	10
Thailand	−0.400	0.012	−0.557	0.997	−2.208	0.997	12

Notes: The 10%, 5% and 1% critical values for *KSS* test statistics are, respectively, −2.66, −2.93 and −3.48. Superscripts [a] and [b] denote significant at 10 and 5 percent levels respectively. Portmanteau statistic is applied to test for the presence of serial correlation up to 20 lags and its marginal significance value is denoted as Q.

Since this study employs similar dataset as Lee *et al*. (2004) but with different methodology, a comparison of the results can be made. First, the ADF unit root test results in Lee *et al*. (2004) reveal that there is a divergence of income between Japan and each of these East Asian countries. The authors demonstrated that the failure of ADF test to identify convergence stems from the presence of structural discontinuities in the convergence process. However, the present study found that the failure is due to the presence of non-linearity in the data generating process of income differences. In particular, given the strong evidence of non-linearity but a linear method (ADF test) is used to test for income convergence, the inferences and policy prescriptions drawn this linear method are indeed questionable. In fact, many studies (Sarno, 2001; Kapetanios *et al.*, 2003; Liew *et al.*, 2004) have demonstrated the lack of power of the ADF test to reject a false null hypothesis of unit root when the true data generating process is non-linear. Second, using the structural-break unit root test proposed by Zivot and Andrews (1992), Lee *et al*. (2004) are able to obtain evidence of income convergence for Japan-Hong Kong and Japan-Singapore, while Taiwan is catching up with the lead goose of the region. In contrast, from the more robust t_{KSS3} test results, this study found that Korea should be included in the same convergence club as Hong Kong, Singapore and Taiwan. The present finding is not surprising as these Asian '*four little dragons*' economies have been expanding at an average real GDP growth rate of more than 8% per year for the past decades. On the other hand, though Japan has been able to establish herself as the second largest world economy and leader in the East Asian region, the economy of the country has gone weak after the burst of her 'bubble economy" in the 1990s. These two developments have contributed to the convergence of income levels between Japan and these four economies. Third, as compared to the structural-break test, the *KSS* non-linear unit root test is proven to be more powerful in detecting convergence, especially when the data generating process is found to be non-linear in nature. As mentioned earlier, structural discontinuities in the convergence process is just a special type of non-linear process. Hence, the procedure employed in this study ensures a more robust results and the policy prescriptions given are reliable.

CONCLUSION

Given the commitment of these East Asian governments, the push and pull factors behind the 'East Asian community', we share the optimism of other scholars that the 'East Asian community' is a realistic possibility and not an ephemeral dream. In this regard, these East Asian countries could always draw valuable lessons from their EU counterparts in their effort to establish a framework that would contribute to a sense of 'community values' and 'community'. In fact, many scholars have argued that the European Union and the Euro-regime must be a learning model for an agenda of 'East Asian community' (Dutta, 2000, 2002; Letiche, 2000). Despite this optimism, the findings from our empirical investigation reveal that the income disparities between Japan and five of the candidates' economies- China, Indonesia, Malaysia, the Philippines and Thailand, should be on top of the agenda when formulating policies of such regional integration. In particular, using a robust procedure, the *KSS* non-linear unit root test found that there are at least two groups in the East Asian region. The first group consists of the Asian '*four little dragons*' economies- Hong Kong, Korea, Taiwan and Singapore, which are able to converge with the richer Japanese economies over the years, due to liberal trade policies adopted by these countries as noted by Zhang (2003). The remaining countries of the region- China, Indonesia, Malaysia, the Philippines and Thailand, made up the other group, in which their respective income disparities with Japan has widened. As discussed earlier, though the EU's financial commitment to its new or even candidates' economies is indeed worth emulating, financial support such as Structural Funds is not a realistic possibility in the context of East Asian given the limited financial resources that these countries possess. Hence, this issue of income disparities is indeed a daunting task for the policymakers.

As a practical step, the flying geese model of economic development should be uphold in the East Asian economies, with Japan continue to be the lead goose. As recommended by Kojima (2000: 397), the member countries of the proposed 'East Asian community' should take more positive initiatives in promoting regional economic development. According to the author, by propelling regional economic development, these East Asian economies should be able to raise their per capita incomes to the advanced economies' level, with more equal income levels among themselves, say within 20 or 30 years. Then, a new horizon for further integration and development will be open. To conclude, while there is no roadmap for the formation of 'East Asian community', the journey has actually begun, even though there is still a long way to go, just as the progression of EU took about half a century to reach its present state.

REFERENCES

Carlino, G.A. and Mills, L.O. (1993) Are U.S. regional income converging? A time series analysis. *Journal of Monetary Economics*, 32, 335-346.

Datta, A. (2003) Time-series tests of convergence and transitional dynamics. *Economics Letters*, 81, 233-240.

Durlauf, S.N. (2001) Essays: manifesto for a growth econometrics. *Journal of Econometrics*, 100, 65-69.

Dutta, M. (2000) The euro revolution and the European Union: monetary and economic cooperation in the Asia-Pacific region. *Journal of Asian Economics*, 11, 65-88.

Dutta, M. (2002) Asian Economic Community: intra-community macro-and-micro-economic parameters. *Journal of Asian Economics*, 13, 447-491.

Dutta, M. (2003) China's economic presence: Asian Economic Community. *Journal of Asian Economics*, 14, 581-592.

Gatti, D.D., Gallegati, M. and Mignacca, D. (1998) Nonlinear dynamics and European GNP data. *Studies in Nonlinear Dynamics and Econometrics*, 3(1), 43-59.

Harvie, C. and Lee, H.H. (2002) New regionalism in East Asia: How does it relate to the East Asian Economic Development model? *ASEAN Economic Bulletin*, 19(2), 123-140.

Heston, A., Summers, R. and Aten, B. (2001) Penn World Table version 6.0. Center for International Comparison at the University of Pennslyvania.

Kapetanios, G., Shin, Y.C. and Snell, A. (2003) Testing for a unit root in the nonlinear STAR framework. *Journal of Econometrics*, 112, 359-379.

Kojima, K. (2000) The "flying geese" model of Asian economic development: origin, theoretical extensions, and regional policy implications. *Journal of Asian Economics*, 11, 375-401.

Lee, H.A., Lim, K.P. and Liew, V.K.S. (2004) Income convergence between Japan and the rest of East Asian countries. *Journal of International Business and Economics*, forthcoming.

Letiche, J.M. (2000) Lessons from the euro zone for the East Asian economies. *Journal of Asian Economics*, 11, 275-300.

Li, Q. and Papell, D.H. (1999) Convergence of international output: time series evidence for 16 OECD countries. *International Review of Economics and Finance*, 8, 267-280.

Liew, V.K.S., Baharumshah, A.Z. and Chong, T.T.L. (2004) Are Asian real exchange rates stationary? *Economics Letters*, 83, 313-316.

Liew, V.K.S., Chong, T.T.L and Lim, K.P. (2003) The inadequacy of linear autoregressive model for real exchange rates: empirical evidence from Asian economies. *Applied Economics*, 35, 1387-1392.

Lim, K.P. and Liew, V.K.S. (2004) Non-linearity in financial markets: evidence from ASEAN-5 exchange rates and stock markets. *ICFAI Journal of Applied Finance*, 10(5), 5-18.

Lim, K.P., Azali, M. and Habibullah, M.S. (2003) Non-linear dynamics in bilateral Malaysian ringgit- U.S. dollar spot rate. *Jurnal Analisis*, 10(2), 77-97.

Loewy, M.B. and Papell, D.H. (1996) Are U.S. regional incomes converging? Some further evidence. *Journal of Monetary Economics*, 38, 587-598.

Luukkonen, R., Saikkonen, P. and Teräsvirta, T. (1988) Testing linearity against Smooth Transition Autoregressive Models, *Biometrika*, 75, 491-499.

Öcal, N. and Osborn, D.R. (2000) Business cycle non-linearities in UK consumption and production. *Journal of Applied Econometrics*, 15, 27-43.

Oxley, L. and Greasley, D. (1995) A time-series perspective on convergence: Australia, UK and USA since 1870. *Economic Record*, 71, 259-270.

Park, D. (2000a) Intra-Southeast Asian income convergence. *ASEAN Economic Bulletin*, 17, 285-292.

Park, D. (2000b) Is the Asia-Australasia region a convergence club? *Asian Economic Journal*, 14, 415-419.

Park, D. (2003) An empirical examination of income convergence in the Asia-Pacific region. *Journal of Asian Economies*, 14, 497-502.

Perron, P. (1989) The great crash, the oil price shock, and the unit root hypothesis. *Econometrica*, 99, 1361-1401.

Perron, P. and Vogelsang, T.J. (1992) Nonstationarity and level shifts with an application to purchasing power parity. *Journal of Business and Economic Statistics*, 10, 301-320.

Potter, S.M. (1995) A non-linear approach to US GNP. *Journal of Applied Econometrics*, 10, 109-125.

Robson, P. (1998) *The economics of international integration*. London: Routledge.

Sarno, L. (2001) The behavior of US public debt: a nonlinear perspective. *Economics Letters*, 74, 119-125.

Scheinkman, J.A. and LeBaron, B. (1989) Non-linear dynamics and GNP data. In W.A. Barnett, J. Geweke and K. Shell (eds.) *Economic complexity: chaos, sunspots, bubbles, and nonlinearity*, pp.213-227. Cambridge: Cambridge University Press.

Skalin, J. and Teräsvirta, T. (1999) Another look at Swedish business cycles, 1861-1988. *Journal of Applied Econometrics*, 14, 359-378.

Solow, R.M. (1956) A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70, 65-94.

Teräsvirta, T. (1994) Specification, estimation, and evaluation of Smooth Transition Autoregressive Models. *Journal of the American Statistical Association*, 89(425), 208-218.

Terasvirta, T. (1995) Modelling nonlinearity in U.S. gross national product, 1889-1987. *Empirical Economics*, 20, 577-597.

World Bank (1993) *The East Asian Miracle: economic growth and public policy*. Oxford, UK: Oxford University Press.

Yu, T.S. (2003) Can East Asia rise again? *Journal of Asian Economics*, 13, 715-729.

Zhang, Z. (2003) Can the rest of East Asia catch up with Japan: some empirical evidence. *Japan and the World Economy*, 15, 91-110.

Zhang, Z., Liu, A. and Yao, S. (2001) Convergence of China's regional incomes 1952-1997. *China Economic Review*, 12, 243-258.

Zivot, E. and Andrews, D.W.K. (1992) Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business and Economic Statistics*, 10, 251-270.

The Impact of Non-Price Factors on Intention to Purchase Counterfeited Luxury Branded Goods: Young Consumers View

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ABSTRACT

Despite the seriousness of the counterfeiting or piracy, there is a noticeable lack of investigation into its determinants of intention to purchase counterfeited goods itself especially in Malaysia perspective. This study aims to uncover the impact of non-price factors or answering the question of *'why do consumer purchase counterfeited goods'* in Malaysian market. As such, the study attempts to investigate the Malaysian consumers' overall perception toward counterfeited luxury branded goods such as branded clothes and sportswear and to examine the underlying factors that motivated them to purchase the counterfeited items. Four variables namely, attitude toward counterfeiting and lawfulness, psychographics, product attribute and demographics were examined. A convenience survey of consumers in northern region of Peninsular Malaysia particularly from university students provides data for this study. The result suggest that firstly, the attitude toward counterfeiting has a major impact on intention to purchase luxury branded goods and followed by product attributes dimension. Secondly, consumer decision in purchasing counterfeited luxury branded goods is compensatory (where good performance on one attribute compensate for the poor performance of other attributes). However, demographics and psychographics have shown only a very small impact on intention to purchase counterfeited luxury branded goods.

INTRODUCTION

Branding has traditionally been viewed as an essential tool for marketers to establish an identity for their products and a key factor in determining the product success in the marketplace. In addition, well established and well known brand name usually in tandem with the high quality products and might be able to fulfill the consumer's specific requirements, and the most important is to fulfill the utility purpose, image, and reliability. Hence, branding has enable producers to develop consumer loyalties, heighten consumer awareness and develop extensions of the brand (Gerald and Norman, 1997).

The above mentioned advantages of the well known brand name have actually attract many people to join the market without proper planning and business practice. The attractive business opportunity of well known brand had open the eyes of those irresponsible marketers (which is totally wrong in business and social ethics) to offer the cheap versions of those well known brands which are similar in term of product attributes and appearance. Fore sure, this cheap versions (so called as imitated products) were sold at cheaper price than those original brands but using similar technology and cheap and low quality materials. Based on the report by Ministry of Domestics Trade and Consumer Affair (MDTCA), government had successfully raid variety of imitated products from business areas such as business store, stall, walk-side market, night market, and even illegal factory around Selangor (Harian Metro, October 2002). Part of the products are equipments smuggled or trafficking from China such as drugs, branded clothes, sportswear, high performance audio equipment and home appliances such as rice cocker, refrigerator, washing machine, blender and so forth.

PROBLEM STATEMENT

Counterfeits also involved products of well-known luxury brands. From the counterfeiters' point of view, these allow consumers with low income to fulfill their ego status in the social context. The luxury branded goods

such as Alfred Dunhill, Bonia, Gucci, Hermes, Lacoste, Omega, Tiffany & Co. and the like are easily available in Malaysian market nowadays. Previous study indicated that almost 60 percent of the consumer had purchased at least one luxury brand counterfeits (Nia & Zaichkowsky, 2000). Sportswear industry also attracts counterfeiter after turning into a fashion industry. The brands such as B.U.M. equipment, Adidas, Nike, Diadora, and Body Glove become most common to counterfeiters and these fakes were targeted at youngsters. Statistics on seizures by US customs in 1994 relating to Intellectual Properties Right (IPR) infringements show that counterfeit sporting goods accounted for 10 percent of all goods seized that year (Hema, 1998).

Beside that, leading US-based apparel manufacturer, Levi Strauss (Malaysia) Sdn Bhd (LSM) was also reported working closely with MDTCA to counter counterfeiter producing fake Levis-brand apparel products in Malaysia. In April 2001 alone, the ministry has conducted 1,264 raids and confiscated RM300,000 worth of imitation branded goods. Nike also reported that it suffered revenue losses of USD70 million a year due to the counterfeited brands (Modi, 2000). Counterfeiting reported not only affect the marketer in term of revenue losses but also contributing in job losses in worldwide. In Europe, 100 000 people loss their jobs while in United State of America 130,000 people were affected due to this counterfeiting (Hema, 1998). In addition, the most impossible to value is the damage incurred on the company by the dilution of its brands (Nia and Zaickowsky, 2000). The above situations show us how serious are the counterfeiting problem in Malaysia. Not to mention counterfeiting in optical media product such as software, movie or song of famous artist in compact disk (CD) and video compact disk (VCD). It may be improper to assume that the counterfeiting in luxury branded goods is not as bad as that happens to optical media product. Yet this product (luxury branded goods) also threatened seriously by the counterfeits versions and not much were exposed by mass media or lack of enforcement by the authorized entity. The question is, the authorized entity equally controlled other counterfeits product (including apparels and sportswear) as well as piracy (software, CD and VCD)? If yes, why other items which is more dangerous than optical media product still easily available in the marketplace?

Therefore, the objective of the study is to investigate the counterfeiting industry in Malaysia, by examining the consumer attitude toward counterfeited goods and motivation factors that may affect the consumer's intention to purchase the counterfeited goods. Specifically, the objectives of the study are to examine the relationship between attitude toward counterfeiting/lawfulness, product attributes, psychographics, and demographics on intention to purchase counterfeited luxury branded goods.

For the purpose of the study, only knowingly purchase counterfeited goods consumers were examined. Those who do not realize that they are buying a counterfeits is assumed to be deceived by the supplier and this can be discussed in another topic by itself. The non-price impact is examined because price is unquestionably one of the most important marketplace cues (Lichtenstein, 1993). In addition, previous research also concluded that such misbehavior also influenced by high price differential between original and counterfeited versions (Bloch et al., 1993). The product under study is counterfeited luxury branded goods (which includes branded clothes and sportswear). The influences are attitude toward counterfeiting/lawfulness, product attributes (include durability, image, physical appearance, purpose and quality, and perceived fashion content), psychographics (include brand status, novelty seeking, and risk taking), and demographics (include age, education attainment, and house income).

LITERATURE REVIEW

The most prominent study in consumer behavior perspective done by Wee et al. (1995), identified three major variables by using eight main causes of counterfeited products purchase behavior. The variables are psychographics (attitude, brand status, materialism, novelty seeking, and risk taking), product attributes variable (durability, image, physical appearance, purpose and quality, and perceived fashion content), and demographics variable (age, education attainment, and house income). Based on the study, only product attributes dimension is highly significant towards intention to purchase counterfeited product, namely as pirated literature, pirated software, counterfeited wallets/purses and watches dominated by attribute concerns of appearance, image, purpose, and perceived quality. Previous studies also suggest that for consumer counterfeited products, physical appearance, the forte of the counterfeiter, may be more important to the buyer than long-run product quality (Bush et al., 1989). For example, in the case of luxury goods markets, a trademark or brand is used to impress observers rather than to guarantee quality.

Product performance is also the most important determinant in willingness to buy counterfeited product (Cordell et al., 1996). According to the researchers, product classes that have little perceived investment-at-risk, or whose performance characteristics can be evaluated before purchase, are most likely to find a market of consumers who are willing to buy counterfeits. Since the products chosen for this study include branded products like clothes and sportswear, it would be interesting to examine if characteristics like durability, quality

and performance, and physical appearance (does it look like the genuine article) play important roles in influencing consumers' purchase of such counterfeited products.

It has been well established that attitude influences behavioral intention (Fishbein, 1970). Previous study by Wee et al., (1995), considered the effects of two specific issues on consumers' behavioral intention and behavior towards counterfeit purchases, i.e. attitude towards counterfeiting and attitude towards market practices. If a person's attitude towards counterfeiting is favorable, it is highly likely that he or she would consider the purchase of counterfeit products.

Brand status refers to an individual's consumption pattern symbolizes his or her social class position, and is a more significant determinant of his or her buying behavior than just income (Martineau, 1968). In this sense, products are obtained as means to an end. Given that people tend to associate themselves with the current social class position they are in or the class above them (Mellott, 1983), they are more likely to buy branded products, which can convey brand status of affluence, wealth and social class. If brand status is important to a person but he or she cannot afford the expensive originals, he or she is likely to turn to counterfeited products as cheap substitutes for the originals. For example, the popular press has reported that although some Japanese consumers have an insatiable appetite for brand-name luxury goods, they also do not sniff at imitations, which is the next best thing for people who cannot afford shopping trips abroad, or the high prices in Japan.

Ang et al., (2001), suggest that the intention to buy counterfeits also drive by the social pressure. However, the extent to which consumers are influenced by social pressure in their attitude also depends on their susceptibility to such pressure. Consumer susceptibility is "the need to identify with or enhance one's image in the opinion of significant others through the acquisition and the use of products and brands, the willingness to conform to expectations of others regarding purchase decisions, and the tendency to learn about products by observing others or seeking information from others" (Bearden et al., 1989: p. 473). Beside social pressure, peer pressures also become one of the determinants of intention to buy counterfeits. Nancy (1999) states that people are most likely to engage in illicit behavior if there is peer pressure to do so. They are less likely to purchase an illicit product if they are alone or with someone who is not engaged in illegal behavior.

While it would seem logical and proper to assume that people tend to engage in machine-like behavior in order to simplify and standardize a complex world, there seems to be strong evidence that, at least occasionally, we seek variety and difference simply out of a curiosity need (Hawkins et al., 1980). The researchers refer to this curiosity need as novelty seeking, and define it as the search for something new, strange and unknown to the seeker. Novelty seeking may arise out of consumers' satiation with product attributes (Jeuland, 1978; McAlister and Pessemier, 1982), or with the brands they frequently repurchase, particularly for products with low purchase risks (Howard and Sheth, 1969). Thus, novelty-seeking consumers are more likely to purchase counterfeited products as these are low cost means of satisfying their curiosity and need for experimentation.

Perceived risk is most prevalent consideration in the study of consumer misbehavior. Risk refers to the extent that a consumer cannot always be certain that all of his or her buying goals will be achieved as risk is perceived in most purchase decisions (Cox, 1967). The concept of perceived risk was introduced by Bauer (1960) where he characterized consumer choice in terms of risk taking or reducing behavior. Rettig and Rawson (1963) found that risk was an important antecedent to the manifestation of unethical behavior. To some consumers, buying counterfeited products may be considered as a risky venture, given that they may lose money (financial risk) in buying a faulty or unreliable product (performance and functional risks). Most important of all is the social risk involved in purchasing counterfeited products. If the social groups to which a person belongs or aspires to belong, does not approve of counterfeit purchases, the person runs the risk of being ostracized or sanctioned for buying such products. For example, it has been suggested that higher income consumers associate socially more with people who are apt to be able to detect counterfeited products, hence these consumers are unlikely to purchase counterfeited products. Given the inverse relationship found between the level of perceived risk and consumer product trial, consumers could be expected that who are averse to financial risk, product risk, and social risk are less likely to purchase counterfeited products (Roselius, 1971).

In the study by Cordell et al. (1996), they explore on the factor of attitude toward the law and product traits as determinants of intention to purchase counterfeits. According to the study, attitude toward lawfulness and espoused willingness to purchase counterfeits were significant in the intention to buy the low investment-at-risk product, but may have been suppressed by unfavorable performance expectation on the high investment-at-risk product. In addition, the finding also consistent with Wilkes (1978) and Cole (1989), that consumer invokes his/her lawfulness attitude selectively when confronted with moral conflict in the marketplace. According to the researchers, moral attitudes may not act as a barrier to intentions in the presence of practical deterrents, but may be erected in the presence of practical deterrents.

The perspective on demographics is also importance to be taken into account in determining the intention to purchase counterfeits. Different demographics profile will behave totally difference from each another. Solomon and O'brien (1991) found that the consumers' age, education background, and family economic background are significantly correlated with their attitude toward software piracy. However, this behavior varies depending on the nature of the counterfeits product. For instance, since branded fashion or fashion-related products are normally highly priced, it is not surprising to find that the negative effect of the demographic variables, such as household income, applies only to counterfeit fashion or fashion-related goods (i.e. consumers with higher household income are less likely to purchase counterfeited fashion/fashion-related items) (Wee et al., 1995). According to these authors only education attainment and household income will affect the intention to purchase counterfeits. The study on software piracy among academic (Rahim et al., 2000) which also explore the dimensions of demographic variables found that, a higher proportion of male academics tend to use pirated software as opposed to their female counterparts. However, this study was inconsistent with the finding by Wood and Glass (1995) who found that female undergraduate students had tendencies toward counterfeits especially software piracy than males.

Studies on relationship between education level and intention to purchase counterfeits encountered mixed result. Kolberg (1969) found that educational level and counterfeits is positively correlated. The higher the education level, the more influence to purchase the counterfeits. The finding by Wee et al. (1955) is consistent with the study. This is part due to the increased in use of computer technology in educational and business organizations. Income also was suggested to influence the purchase intention of counterfeits. Wee et al. (1995) stated that household income have a negative effect on purchase intention. Those brand conscious consumers generally buy cheaper counterfeited goods if they cannot afford the higher priced originals. Thus, subject with higher household income are less likely to buy counterfeited products.

METHODOLOGY

Questionnaire Design and Administration: The questionnaire consists the general information on consumer behavior and intention to purchase counterfeits; attitude toward counterfeiting and lawfulness; psychographics factors; product attributes; and the profile of the respondents. Most of the questions were mainly on 5-point Likert Scale. Pretesting of the questionnaires was conducted in UUM. 50 students were selected from various faculties namely, Business, Economics, Information Technology, and Accounting. Self-administered questionnaires were distributed to the sample that was randomly selected based on the convenience of both researchers and respondents. A total 413 usable questionnaires were returned and used to test the hypothesis of the study.

Selection of the Study: The population under study consists of consumers in Northern region of Peninsular Malaysia. University Utara Malaysia's (UUM) students and working adults in Penang Island were approached to collect valuable data pertaining to counterfeits purchasing behavior. The reasons of selecting the sample are due to easy access of the product under study in respondent areas, financial, and time constraints. In addition, both sample (students and working adults) were active market player in term of monetary spent on entertainment, fashion, and so on. They are a potential user of counterfeited items because of limited budget. 500 respondents were approach (350 for UUM students and 150 for Penang's working adults) through conveniently selected after class hour (lecture) and their visit to shopping mall (for working adults).

Development of Measures: Most measures were either adopted from previous studies or develop specifically for the analysis. The measures of product attributes, psychographics, attitude toward counterfeits, and demographics were constructed by combining the scales of Wee et al. (1995); Nancy, 1999); Greenberg et al. (1983); Rahim et al. (1999) and Ang et al. (2001). Measures on attitude toward lawfulness were developed by modifying the scales that of Cordell et al. (1996).

Conceptual Model

For the purpose of the study, a new theoretical framework was developed to guide an overall research development (see Figure 1). This framework is an extension of the model by Wee et al. (1995) by incorporating the model developed by Cordell et al. (1996).

Independent Variables   Dependent Variable
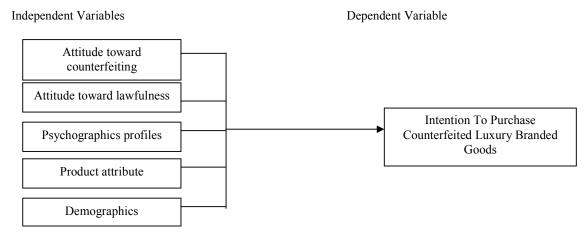
Figure 1: The Conceptual Model

Thus, based on the conceptual model, we can hypothesize that:

H₁: Attitude toward counterfeiting will have significant relationship on intention to purchase counterfeited goods.

H₂: Attitude toward lawfulness will have significant relationship on intention to purchase counterfeited goods.

H₃: Psychographics profiles will have significant relationship on intention to purchase counterfeited goods.

H₄: Product attributes will have significant relationship on intention to purchase counterfeited goods.

H₅: Demographics will have significant relationship on intention to purchase counterfeited goods.

THE FINDINGS

Respondents' Demographic Profiles

For the purpose of the study, only 396 out of 500 (79.2 %) of the questionnaires were processed for the analysis. For demographics profile of the total respondents, seven questions were put forward to the respondents; i.e. gender, marital status, personal monthly income, age, ethnicity, education level, and occupation. The finding of the respondents' demographic profiles is shown in Table 1 as in page 8.

Intention To Purchase Counterfeited Luxury Branded Goods

Based on Table 2 (see page 8), overall regression analysis for counterfeited luxury branded goods provides a little support to all the hypothesized relationship. Based on the result, only two independent variables, namely attitude toward counterfeiting and product attributes are significant to intention to purchase with beta coefficient of 0.321 and $p<0.00$ and 0.205 and $p<0.000$ respectively. Product attribute dimension is dominated by durability (beta=0.227, $p<0.000$) and perceived fashion contents (0.180, $p<0.001$). Attitude toward lawfulness and psychographics profiles show insignificant relationship to intention to purchase counterfeited luxury branded goods (beta=0.066 ($p<0.149$), and 0.049 ($p<0.396$) respectively). None of the demographics profile under study i.e., income, age and education give an impact to intention to purchase counterfeited luxury branded goods. The beta coefficients for the above demographics profiles are 0.011 ($p< 0.855$), 0.074 ($p<0.227$) and 0.023 ($p<0.611$) respectively. Overall, the model explains a small variance in the independent variables with only 18.1 percent with intention to purchase counterfeited luxury branded goods. In conclusion, the largest impact on intention to purchase counterfeited luxury branded goods is dominated by attitude toward counterfeiting itself and supported by the product attributes of the counterfeited version. Attitude toward lawfulness, psychographics factors, age, income and education attainment seemed to give a very low impact or no impact at all to the intention to purchase luxury branded goods.

Table 1: Demographic Profiles of Respondents

	N	Percentage
Gender		
Male	126	31.7
Female	270	68.3
Total	396	100.0
Marital Status		
Single	357	90.1
Married	39	9.9
Total	397	100.0
Age		
Below 18	30	7.6
18 to 25	331	83.6
26 to 35	35	8.8
Total	396	100.0
Personal Monthly Income		
RM 500 and below	232	58.6
RM 501 to RM 1000	79	19.9
RM 1001 to RM 1500	46	11.6
RM 1501 to RM 2000	18	4.6
RM 2001 to RM 2500	11	2.9
RM 2501 and above	10	2.4
Total	396	100.0
Ethnicity		
Malay	236	59.6
Chinese	124	31.5
Indian	28	7.0
Others	8	1.9
Total	396	100.0
Highest Education Level		
Primary	5	1.2
Secondary	49	12.3
College	37	9.4
University	304	76.8
Professional Bodies	1	0.2
Total	396	100.0
Occupation		
Student	308	77.7
Government	20	5.1
Private	66	16.7
Others	2	0.5
Total	396	100.0

Source: Survey

Table 2: Summary of Regression Analysis Result

Dependent Variable	Independent Variables	R^2	Adjusted R^2	Standardized Beta	T	Sig.	F
Intention to purchase	a. Attitude toward Counterfeiting	0.188	0.174	0.321	6.614	0.000	13.39
	b. Attitude toward Lawfulness			0.066	1.445	0.149	
	c. Psychographics			-0.049	-0.85	0.396	
	d. Product attribute			0.205	3.571	0.000	
	e. Income			-0.011	-0.183	0.855	
	f. Age			0.074	1.209	0.227	
	g. Education			0.023	0.508	0.611	

Source: Survey

IMPLICATIONS OF THE STUDY

In general, not all regression analyses were able to support the hypotheses developed in the study. Only two out of five hypotheses are supported or significant in this study i.e., attitude toward counterfeiting and product attribute dimension as discussed earlier. Demographics profiles, which believed to influence consumer purchase intention toward counterfeited luxury branded goods, fail to show a significant relationship.

Although the effect of demographics is very small and seemed to have no association at all, the role of demographics cannot be ignored in the model. In reality, the lower income tends to be more influenced to buy counterfeited goods as compared to the higher income (Solomon and O'brien, 1991; Wee et al., 1995; Rahim et al., 2000). However, the relationship of income and intention to purchase counterfeited goods is not always negatively correlated since some of the affluent people also buy counterfeited branded clothes and sportswear for informal uses (Ang et al., 2001). Generally, age and education attainment show no significant impact on intention to purchase counterfeited goods. In other words, no matter how old and how educated the consumer is, the intention to purchase counterfeited goods is not affected. Thus, the study on intention to purchase counterfeited goods among Malaysians shows that the buyer comes from various ages and education level.

Based on the theoretical framework, two main issues can be concluded. First and foremost we can learned that, the Malaysian's attitude toward counterfeiting contribute a major impact of such 'consumer misbehavior' activity, i.e. intention to purchase counterfeited goods. Secondly, consumer decision making in buying counterfeited goods is compensatory (where good performance on one attribute compensate for the poor performance on other attributes). For instance, consumers might have known that the counterfeited clothes is of low quality as compared to the original, they still prefer to buy them because of the perceived fashion content of the product which offer variety in fashion, features or design.

From the managerial perspective, it is important for the management or those with the authority to focus on motivating the consumers to purchase the original items. The best way to discuss the consumer behavior on intention to purchase counterfeited goods is through the manipulation of marketing mix such as product and promotion. Since counterfeited goods can fulfill the utility purpose, similar in term of physical appearance and durability as good as that of the original items, marketer should focus on differentiating their products as much as possible from the counterfeited versions. This can be done by emphasizing on quality and appearance differences. The used of warranties, guarantees, and after sales services are some prominent actions that can be taken by the original manufacturers or retailers. In addition, the revision or updated version or extended attributes/function of the previous product may be relevant to attract the consumers who seek for variety in product offer.

Promotion also can be used as medium to combat the counterfeiting activities. Promotion can be used to persuade the consumers to buy the originals. However, the critical element especially on the product attribute dimension should be well managed. For instance, the original producers should emphasize on the product benefits, quality, value, style, variety in fashion, and good physical workmanship or finishing. Based on the finding, these criteria are becoming popular among respondents' evaluation criteria of counterfeited purchase behavior. Clearly state in the study that, attitude toward counterfeiting is highly significant toward intention to purchase counterfeited goods. The more favorable consumers toward counterfeiting, the higher the tendency consumers will purchase counterfeited goods. Meaning to say that, counterfeiting activities are supported by the consumers. Therefore, educating on the Intellectual Property Rights and consumers awareness should be considered to help the successfulness of combating the counterfeit activities. Again, Tan Sri Muhyiddin Yassin stressed that the counterfeiting problems in Malaysia cannot be solved as long as the society do not have a strong knowledge of Intellectual Property Rights (Mingguan Malaysia, Sept 22, 2002). True enough where consumers in Malaysia had strong belief that buying counterfeited goods is perceived as minor law violation.

Researchers would suggest some recommendation to reeducate the consumer. This can be done through advertising by manipulating the Elaboration Likelihood Model (ELM) mainly to enforce the belief, attitude, and behavior change (Blech and Blech, 2001). In part, marketer can use celebrity endorsers in the advertisement, which emphasize the importance of buying the originals, and being 'real' in the society. Beside that, the comparative advertising could also be done to point out the risks of counterfeited goods (social risk, physical risk, financial risk). The 'drama type' or 'slice of life' approach also can be applied by stressing the consequences of using or buying counterfeited goods especially if being caught and punished by the authorized entity. The more aggressive suggestion might be the implementation or introduction of new syllabus of Intellectual Property Rights in school or university curriculum. This will help to increase the consumer's awareness toward counterfeiting and at least to decrease the growth of counterfeits in the near future. However, the knowledge from the parent by not buying counterfeits for the home uses can be more effective. This will

motivate their children or households to avoid using the counterfeit versions and this childhood consumer socialization will help the better responsible consumers in the marketplace.

As a conclusion, the tasks of combating the counterfeits problem cannot be solely depended on the government's action. The successfulness of the policy and the strategy implementation can only be achieved through the integration and cooperation of all individuals and groups of anti-counterfeiting. Marketers, NGOs, retailers, and even consumers should boycott the manufacture, distribute, purchase, and use of the counterfeited goods. Governments and NGOs should focus on combating the counterfeits activity and not to blame each other. In short, everyone has its roles and responsibility in eliminating and solving this problem together.

RECOMMENDATION FOR FUTURE RESEARCH

One of the important issues to be noted is that this study is only a sample of time. In short, the findings of the study are only applicable within the next few years. Similar study would have to be conducted from time to time to uncover the changes in the factors that influence consumers' intention to purchase counterfeited goods. Most of the literatures for intention to purchase counterfeited goods are based on the study on pirated products, i.e. optical media products such as CDs and VCDs. As such, to support the arguments for the study, the literature reviews are derived from the software piracy studies and thus do not support product category under study. In fact, the availability of the literature reviews in other product categories will be able to help the researcher to understand better what really happen to other product categories compared to software piracy, such as the range of attributes used to measure attitude toward counterfeiting and lawfulness.

The study at hand cannot be generalized to the general consumers because the respondents used in the study were mainly university students and young working adults. The respondents can be categorized as young people with homogeneous characteristics in term of age, income, education attainment, and even purchasing pattern. In addition, the sample is only one of the segments of the market, which cannot be generalized to the whole Malaysian consumer behavior toward counterfeiting. This is because of the time and financial constraints to obtain a huge sample comprising samples of all ages, education level, income level, and to cover a nationwide study.

While this study focused only on the five major factors, namely; attitude toward counterfeiting, attitude toward lawfulness, psychographics profiles, product attributes, and demographics, future research should look at other factors that may influence the intention to purchase counterfeited goods. With such information, the marketer and the authorized bodies can better design their strategy to combat the counterfeiting activities. At the same time, suggestions on how to improve the weaknesses of the original brands will also be beneficial. Not only the factors that will influence the purchase intention, the product category itself can be manipulated or studied by the researchers such as counterfeited automobile spare parts and home appliances which are more dangerous to human safety whether toward physical risk or financial risk.

In term of methodological issues, particularly the sample used in the study, future research can conduct a similar study which covers a bigger number of sample that comprise all demographics composition in term of age, education background, income, etc. The study may cover all of the Malaysian consumers from the whole country, i.e. from major towns and not only confine to the specific location. Therefore, the generalizability of the findings can be increased and applied to the population. In addition, the findings can show the trend of attitude toward counterfeiting, attitude toward the lawfulness (IPR), product attribute preferences, psychographics profiles, demographics and finally their intention to purchase counterfeited goods of different product categories.

CONCLUSION

In conclusion, to develop better understanding on the consumer 'misbehavior' toward purchasing counterfeited goods, the path of Theory of Reasoned Action (TRA) could be used to obtain a more precise finding (Fishbein and Ajzen, 1975). The theory clearly indicates that the influence of "significant others' (such as relatives and friend's opinion) toward certain behavior, i.e. toward intention to purchase counterfeited goods. Although the study did not measure the issues directly, it is covered in the psychographics dimension in general. In addition, to ensure the study can represent holistic picture of all consumers, it must be done on general consumer.

REFERENCES

Ang, S. H, Cheng, P. S., & Lim, A. C. (2001). Spot the difference: Consumer responses toward counterfeits. *Journal of Consumer Behavior,* 18 (3), 219-235.

Bearden, W. O., Netemeyer, R. G., & Teel, J. E. (1989). Measurement of consumer susceptibility to interpersonal influence. *Journal of Consumer Research,* (15), 473- 481.

Blech, G. E., & Blech, M. A. (2001). *Advertising and Promotion: An Integrated Marketing Communications Perspective, 5th ed.* New York: McGraw-Hill Publishing Company Limited.

Bloch, P. H., Bush, R. F., & Campbell, I. (1993). Consumer 'accomplices' in product counterfeiting. *Journal of Consumer Marketing,* 10 (4), 27-36.

Bush, R. F., Bloch, P. H., & Dawson, S. (1989). Remedies for product counterfeiting. Business Horizons, January-February, 59-65 in Wee, C.H., Ta, S.J., & Cheok, K.H. (1995). Non-price determinants of intention to purchase counterfeit goods: An exploratory study. *International Marketing Review,* 12 (6), 19-46.

Cole, C. A. (1989). Deterrence and consumer fraud. *Journal of Retailing,* 65, Spring, 107-120.

Cordell, V.V., Wongtada, N., & Keischnick, R.L. (1996). Counterfeit purchase Intentions: Role of Lawfulness Attitude and Product Traits as determinants. *Journal of Business Research*, 35, 41-53.

Cox, D. F. (1967). Risk taking and information handling in consumer behavior. Harvard University Press, Boston, MA.

Fishbein, M, & Ajzen, I. (1970). Belief, attitude, intention, and behavior: an introduction to the theory and research. Addison-wesley: Reading, MA.

Greenberg, C. J., Sherman, E., & Schiffman, L. G. (1983). The measurement of fashion image as the determinant of store patronage. *Patronage Behavior & Retail Management.* North Holand, New York.

Hawkins, D. I., Coey, K. A., & Best, R. J. (1980). *Consumer Behavior: Implications for Marketing Strategy.* Dallas: Business Publications.

Hema V. (1997). The Economic Impact of Counterfeiting. Paper presented to Industry Committee of Organization for Economic Co-operation and Development (OCDE), UK.

Howard, J. A., & Sheth, J. N. (1969). *The Theory of Buyer Behavior.* New York: John Wiley & Son.

Jeuland, A. (1978). Brand preference over time: a partially deterministic operationalization of the notion of variety seeking in Wee, C.H., Ta, S.J., & Cheok, K.H. (1995). Non-price determinants of intention to purchase counterfeit goods: An exploratory study. *International Marketing Review,* 12 (6), 19-46.

Kolberg, L. (1969). Stage and sequence: the cognitive development approach to socialization. *Handbook of Socialization Theory and Research* in Shore, B., Venkatachalam, A.R., Solorzano, E., Burn, J.M., Hassan, S.Z. and Janczewski, L. (2001). Softlifting and piracy: Behavior across cultures. *Technology in Science,* 23 (4), 563-581.

Lichtenstein, D. R., Ridgway, N. M., & Netemeyer, R. G. (1993). Price perceptions and consumer shopping behavior in field study. *Journal of Marketing Research*, 30, 234-245.

Martineau, P. (1968). Social class and spending behavior. Journal of Marketing, 23, 274-278 in Wee, C. H., Ta, S. J., & Cheok, K. H. (1995). Non-price determinants of intention to purchase counterfeit goods: An exploratory study. *International Marketing Review,* 12 (6), 19-46.

McAlister, L., & Pessemier, E. (1982). Variety seeking behavior: an interdisciplinary review. *Journal of Consumer Research,* 9, December, 311-322.

Mellott, D. W. Jr. (1983). Fundamentals of Consumer Behavior. Penn Well, Tulsa: OK.

Modi, T. (2000). Fighting the fakes. [on-line]. Available http://www.indianinfo.com/fmcg/feat.fith.html

Nancy D., & Albers-Miller. (1999). Consumer Misbehavior: Why people buy illicit goods. *Journal of Consumer Marketing,* 16 (3), 273-287.

Nia, A. & Zaichkowsky, J. L. (2000). Do counterfeits devalue the ownership of luxury brands. *Journal of Product and Brand Management,* 9 (7), 485-497.

Rahim, Md. M., Rahman, M. N., & Seyal, A. H. (2000). Software piracy among academics: an empirical study in Brunei Darussalam. *Information Management and Computer Security*, 8 (1), 14-16.

Roselius, T. (1971). Consumer rankings of risk reduction methods. *Journal of Marketing*, 35, January, 56-61.

Solomon, S. L., & O'Brien, J. A. (1991). The effect of demographic factors on attitudes toward software piracy in Wee, C. H., Ta, S. J., & Cheok, K. H. (1995). Non-price determinants of intention to purchase counterfeit goods: An exploratory study. *International Marketing Review,* 12 (6), 19-46.

Wee, C. H., Ta, S. J., & Cheok, K. H. (1995). Non-price determinants of intention to purchase counterfeit goods: An exploratory study. *International Marketing Review,* 12 (6), 19-46.

Wood, W. A., & Glass, R. S. (1996). Situational determinants of software piracy: an equity theory perspective. *Journal of Business Ethics,* 15, 1189-1198.

A Relationship Between Brand Equity, Brand Loyalty and Brand Extension: The Perspectives of Young Adults

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ABSTRACT

Brand equity nowadays is regarded as a very imperative concept in business practice as well as academic research. The competitive advantage of firms that have brands of a highest equity leads the way to brand loyalty and successful extension. Purposely, this study has been conducted based upon five underlying dimensions of customer-based brand equity – performance, social image, value, trustworthiness and commitment as well as its relationship with the dimension of customers' loyalty, and customers' acceptance towards new extension of the brand. Each of these can have a different incidence on the possible consumer responses that determine the advantages (offered by the brand) potentially gained by the firm. Specifically, the objective of this study is to determine the relationships between dimensions of brand equity, customers' loyalty and brand extension. As a sample, 300 students were chosen representing three different level years of study (1,2, and 3), aged between 18 to 25 years old from Universiti Utara Malaysia in which reflecting young Malaysian consumers. Generally, major findings show positive correlation among variables, demonstrating the idea that highest brand equity indeed leads to brand loyalty and subsequently, towards successful brand extension.

INTRODUCTION

A brand is a sign of identification and it can differentiate the products from its competitors. Creating a brand image for a product that matches the consumer's expectations is a formula for certain success. Brand provides security of demand and enables brand owners to generate strong and reliable stream of cash. The demand is positively referred to consumers who purchase the products.

Supplying standard and image to the consumer is arguably the most challenging aspect of running business today. The change in consumer preference is one of the main factor that has to be considered by companies towards better performance and efficiency.

The issue of brand equity has emerged as one of the most critical areas for marketing management. Brand equity is regarded as a very important concept in business practices as well as in academic research because marketers can gain competitive advantage through successful brands (Lassar et al., 1995). From the previous study, the measurement of brand equity from customer perceptions has been underprovided. Since customer perspective is the source of brand equity (Keller, 1993), it is important for managers or marketers to verify, understand and measure the dimensions of brand equity in the context of customer's perceptions.

The change in consumer lifestyle and preference could lead to brand switching. What many marketers fail to realize is that brand switching can represent the reduction of level of brand's demand as well as affecting growth in company's sales and profitability. In addition, it will also ruin customer loyalty and successful brand extensions.

Brand equity in the context of customer perceptions will provide core competency to the company. Customer-based brand equity dimensions can be used as the yardstick to the company in order to increase efficiency as well as deliver the best performance to support customer demand.

Brand loyalty is part of brand equity however brand equity will also lead to brand loyalty. Moreover, one of the elements to build up brand extension is brand loyalty. This condition would thus lead to massive dilemma for the company in order to build customer loyalty if they fail to identify the company's brand equity and brand loyalty. It would also provide difficulties for the company to build brand extension if the customers refuse to accept it.

To overcome the management dilemma, it needs the understanding about the importance of customer-based brand equity, brand loyalty and extension of the brand. Therefore, the main purpose of the research is to study the relationship between brand equity and brand loyalty as well as extension of the brand.

LITERATURE REVIEW

"Branding is centuries old. The brand concept evolved on the eighteenth century as the names and pictures of animals, places of origin and famous people replaced many producer's names" (Farquhar,1990). The purpose was to strengthen the association of the brand name with a product. These basic purposes of branding remain important today. Consumers can easily remember the products with a brand name and it can indirectly gain competitive advantage for producers due to the differentiation of their products.

"In nineteenth century, a related purpose of branding emerged. A brand was used to enhance a product's perceived value through such associations'' (Farquhar, 1990). Thus, a concept of brand equity has importantly argued recently, previous studies have defined that brand equity as the added value with which a given brand endows a product (Cf. Jones, 1986; Leuthesser, 1998; Farquhar, 1990). The concept of brand equity is based on the idea that a brand has a value greater than the sum of its tangible assets that can be defined as an intangible asset.

Brand equity has been described by the Marketing Science Institute as the set of associations and behaviour on the part of a brand's customers, channel members and parent corporation that permits the brand to earn greater volume or greater margins that it could be without the brand name. Thus this definition can be segregated into two aspects of brand equity – one from the point of view of the firm and the other from the consumer. The firm aspect of brand equity appears to build around brand equity outcomes like price and market share, whereas customer-based brand equity appears to have attitudinal associations at its core (Keller, 1993).

The brand equity literatures currently consist of a myriad of unrelated studies. The result is a multitude of different conceptualisation of the concept and reference to even more way of measurement (Mackay et al., 1998). In other words, there are many alternate definitions and concept as well as measurement of value of brand equity. Few studies have attempted to measure brand equity. Lassar et al.'s, (1995) study of customer-based brand equity is based on five underlying dimensions of brand equity: performance, value, social image, trustworthiness and commitment.

The development and maintenance of consumer brand loyalty is placed at the heart of brand equity. In this sense, consumer loyalty is an ingredient towards brand equity. However, brand equity will also represent loyalty of the consumer towards the brand. The value and strength of the brand will definitely contribute the repeat purchases and indirectly it will contribute to customer loyalty to the brand. Brand loyalty is a function of a brand's relative frequency of purchase in both time-independent and time dependent situations (Lyong Ha, 1998). With brand loyalty, company will gain competitive advantage in its market.

The primary capital of many businesses is their brand. To create a brand from scratch requires huge investments. Therefore, financial professionals developed the notion that a brand has an equity that exceeds its conventional asset value. The escalation of new product development costs and the high rate of new product failure has led manufacturers to engage in brand extension (Motameni et. al, 1998). Brand extensions, in which existing brand names are used with new products introduced in different categories, continue to be used frequently by brand managers (Aaker, 1996). According to Sheinin (1998), although managers have many decisions to make regarding the appropriate marketing mix for their products, with brand extensions managers have two primary decisions to make: which category to enter; and what marketing strategy to use.

However, most research in brand extensions has dealt with the first decision, concluding that increased perceived fit between the parent brand's and extension's categories leads to more positive evaluations (Aaker and Keller, 1990). Meanwhile, in the brand extensions literature, it has been widely tested that the perceived quality (brand equity dimension) of the original brand positively conditions the success of extensions (Rangaswamy et al., 1993; Bottomly & Doyle, 1996; Rio et al., 2001).

The Relationship Between Brand Equity, Brand Loyalty and Brand Extension

With the definitions and concepts as mentioned earlier on brand equity, brand loyalty as well as brand extension, it is believed that these three variables have the significantly link among each other (see Figure 1.0: Customer-Based Brand Equity, Brand Loyalty and Brand Extension Model). The rationale for including brand loyalty and brand extension is to determine whether these both variables correlate with brand equity.

Importantly, brand equity is of interest to managers of brand loyalty and brand extensions (Lassar et al., 1995). Brand equity has a positive relationship with brand loyalty. Whereas, brand extensions are an area affected by the original's brand equity (Bridges, 1992; Lassar et al., 1995).

In addition, Farquhar (1990) explained that because brand extensions offer "repeated attitudinal expressions," they can be a powerful tool for increasing equity for the entire brand franchise. For example, Courtyard by Marriott reinforces the Marriott brand as much as it builds awareness for the Courtyard name. Repeated attitudinal expressions can be referred as part of brand loyalty definitions in which this argument has indirectly suggested that there is an intervening variable (brand loyalty) between the relations of brand equity and brand extension.
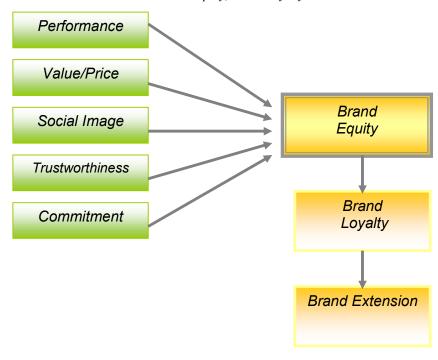
Young Consumer

The change in consumer lifestyle from parent household to independent consumer could lead to brand switching and demolish brand loyalty. Normally, young consumers tend to make a purchase, which is influenced by the parental buying pattern when they first leave home. For example, first year student in higher learning institute would possibly choose the brand used by their family or parent. Nonetheless, that tendency may be short-lived when emerge the interference of new influence on brand choice such as influence of peers, friends, celebrities or role models and marketing influences (Feltham, 1998). Unsurprisingly, these consumers are more involved with trends than possibly any other age group. Thus, it is believed that young consumers are also a vital entity needed to strengthen the equity of the brand.

Meanwhile, according to Lassar et al. (1995), the consumer is a dynamic contributor in the formation of equity. Undeniably, young consumer will also be part of the participant in the creation of brand equity as well as developing brand loyalty. In the mean time, Rio et al. (2001) cited that the association of the brand with the social identification function positively affects the consumer's willingness to accept possible extensions of the brand to other product categories. Therefore, the influence of role models or advertisement in choosing the brand could then dramatically leads young consumers towards to the acceptance of brand extension.

THEORETICAL FRAMEWORK

FIGURE 1: A Model Of Customer Based-Brand Equity, Brand Loyalty And Extensions

The proposed model of customer-based brand equity, brand loyalty and extension (see Figure 1.0) views two categories of statements namely dimensions of customer-based brand equity and model modification. The first point explains detail of the five underlying dimensions of customer-based brand equity as suggested by Lassar et al. (1995). And the second point includes the researcher's suggestions towards the linking between brand equity, brand loyalty and brand extension.

RESEARCH METHODOLOGY

Five dimensions in which consists of performance, value, social image, trustworthiness and commitment has been replicated from Lassar et al. (1995) were used to measure customer-based brand equity. While the statements of brand equity, brand loyalty and brand extensions dimensions are based from other previous studies and researcher's original construct. The questionnaire in this research is consists of three main sections. The first section comprised of standard demographic questions in which include gender, age, ethnic, year of study and financial background.

The second section discussed respondents' current, favourite and future purchase of sport sneakers brand as well as the reasons for choosing brand of sport sneakers. Finally, the third section comprised of 32-point Likert scale questions (ranging from 1 to 5).This section is developed to measure the customer-based brand equity dimensions as well as the relationship between brand equity, brand loyalty and brand extensions.

Sampling Method

A complex probability sampling was used in this survey. The main reason for choosing this technique is because it provides a desired precision at a lower cost of data collecting. Proportionate stratified random sampling approach was chosen in this research for the purpose to increase a sample's statistical efficiency, to provide adequate data for analysing the various subpopulations; and to enable different research methods and procedures to be used in different strata.

Population of this study are among university students in which was segregated by their year of study. After population is divided into the appropriate strata, a simple random sample was taken within each stratum. The sampling results can then be weighted and combined into appropriate population estimates.

Sample Size

The sample for this research was 300 students from Universiti Utara Malaysia. 100 students will be first year students, another 100 students will be second year students and the remaining will be third year students.

Hypotheses

In line with the literature review and the creation of customer-based brand equity model, an empirical study was used to answer the research questions. It is a test of confirmation on the customer-based brand equity model. Thus, the seven hypotheses listed below will be tested and addressed.

> H1:   *Performance dimension has a positive relationship to customer-based brand equity.*
> H2: *Social image dimension has a positive relationship to customer-based brand equity.*
> H3: *Value dimension has a positive relationship to customer-based brand equity.*
> H4: *Trustworthiness dimension has a positive relationship to customer-based brand equity.*
> H5: *Commitment dimension has a positive relationship to customer-based brand equity.*
> H6:   *Brand equity is positively related to brand loyalty.*
> H7:   *Brand loyalty is positively related to brand extensions.*

FINDINGS AND DISCUSSIONS

Discussion of the Results

In achieving one of the objectives of the study, students from Universiti Utara Malaysia were chosen as a sample to represent young Malaysian consumers. These 300 respondents were mostly Malay students and predictably comprised of 94 (31.3%) male while the rest were female (206 respondents or 68.7%). Meanwhile the majority of respondents with 71% or 213 respondents were aged between 20 to 22 years old, whereas the remaining 15% or 45 respondents were aged between 23 to 25 years old, 8.7% respondents (26 respondents) were aged between 17 to 19 years old and 5.3 % respondents (16 respondents) were aged 26 years old and above (As shown in Table 1).

In terms of ethnic proportion, majority of the respondents, which are 222 students or 74% are Malay while 17% are Chinese, 7.3% are Indian, and 1.7% others (As illustrated in Table 2.0). Just like the gender proportion, the race of the respondents is also reflecting to the university's demographic factors, which is factually dominated by the Malay students. Nevertheless, the big gap between Malay respondents and the rest is something not to be worried because the buying pattern and brand preference between those ethnics are not significantly different, particularly when there are still students. In line with the objective of this study, sample has been equally segregated into three categories of year of study, which are first year, second year, and third year. Subsequently, from 300 respondents, each year of study are represented by 100 respondents (33.3%) respectively (As shown in Table 1).

Table 1: Profiles of Respondents

Variables	Frequency (N)	Percentage (%)
Gender		
1. Male	206	68.7
2. Female	94	31.3
Age		
1. 17-19	26	8.7
2. 20-22	213	71.0
3. 23-25	45	15.0
4. >26	16	5.3
Race		
1. Malay	222	74.0
2. Chinese	51	17.0
3. Indian	22	7.3
4. Others	5	1.7
Year of Study		
1. First Year	100	33.3
2. Second Year	100	33.3
3. Third Year	100	33.3

Overall, the results for hypothesis 1 to 5 generally concurred with the Randall et al. (1995) study. As stated in the findings, the level of correlation of customer-based brand equity dimensions (*performance (0.409, P<0.01), social image (0.551, P<0.01), value (0.127,p< 0.05), trustworthiness (0.389, P<0.01) and commitment (0.412, P<0.01)*) with brand equity factor was proven that there is significant relationship among variables. Therefore, the higher the customer perceives on these five underlying dimensions, the greater the brand equity of the sport sneakers. Besides, the main point of this finding has been essentially shown that brand equity in the context of consumers' perception can be wisely measured.

Meanwhile, hypothesis 6 posits that there was also a significant relationship between brand equity factor and brand loyalty factor with the level of correlation coefficient at $r = 0.430$ (p<0.01). Thus, this means that the greater the equity of the brand, the stronger customers' loyalty towards the brand of sport sneakers.

Lastly, for the hypothesis 7, the finding for relationship between brand loyalty and brand extension factors, apparently there was a positive correlation coefficient between both factors ($r = 0.535$, p< 0.01). Therefore, this finding concludes that the more loyal the customers towards the brand, the greater the customers' acceptance of brand extension for sport sneakers.

The results show as expected, that these seventh hypotheses could be well used and very much applicable to support the objectives of the research. Furthermore, these findings can also reflect the overall perspectives of young consumers towards building equity and loyalty of the brand as well as acceptance of the extension of the brand.

Discussions of Managerial Implication

Many people may think that building and maintaining brand equity is solely placed upon the responsibility of brand managers, but it is actually a cross-functional team effort. Crucially, financiers, marketers as well as consumers are the key element in building and developing strong brand equity.

From the firm's perspective, the increased market share from a brand can be readily translated into a dollar measure of equity. Nevertheless, a financiers largely concerned with assessing value for the purposes of setting a price for a firm whereas marketers viewed brand equity as a strategic variables to be built and enhanced by advertising, promotion and public relations activities.

1. *The Relationship between Customer-Based Brand Equity Dimensions and Brand Equity Factor*
    The firm, financiers as well as marketers have to prudently determine the relationship between customer-based brand equity dimensions (performance, social image, value, trustworthiness and commitment) and brand equity factor in order to build and sustain strong brand equity.

    The firm has to develop higher performance of the brand, durability and reliability as well as higher quality of the brand. Subsequently, in order to increase market demand, marketers have to gauge the factors that are likely lead to social image dimension. The comfortable and attractive features of sport sneakers, the pleasant advertisements and the use of favourite artists or sport personalities to promote brands (Michael Jordan: Nike, David Beckham: Adidas and Ryan Giggs: Reebok) are among factors in which represent the 'development factors' for social image dimension. Thus, marketers have to consider and determine those factors if they intentionally want to increase their brand equity.

    Alternatively, value dimension is also a vital variable to build equity of the brand. The company has to identify the level of price of the brand. How much the cost of new category of product extension? How much the cost of a familiar and branded products? Who is the company's target buyer? What is the level of income for the target group? If the customers do find out that the brand is really 'value for money', then this dimension would unquestionably contribute in extending equity of the brand.

    Besides that, equity of the brand would also certainly increase if the consumer sets high value in the brands that they trust. Trust is a key variable in the development of an enduring desire to maintain a relationship in the long term, for example with a brand (Delgado- Ballester and Munuera-Aleman, 2001). Therefore, a manager has to formulate and identify the level of confidence places in the brands as well as firms.

    Finally, managers or marketers have to address customers' personal feeling towards brands. Positive feeling towards brand would lead to customers' commitment and it would gradually contribute in developing greater brand equity. Marketers have to formulate customers' positive feeling towards brands for example if the marketing approach is concerned on prestige of the brand, so consumers who value prestige may respond more positively (committed) to products offered using these brand.

2. *The Relationship between Brand Equity and Brand Loyalty Factor*
    "… A customer isn't a customer until they've bought twice." The first purchase represents trial not commitment but if they come back for more that indicates satisfaction and possibly loyalty. If customers loyal to the brand and stay with brands for longer periods, it would certainly improve brand profitability as well as reduce the costs of doing business because loyal customer would always provide positive word of mouth and diminish acquisition costs.

    Developing and maintaining brand equity dimensions are also critically important to the firm en route for increasing its customers' loyalty. Regarding firms wishing to apply a price premium to their products, it would be essential for them to promote associations related to the functions of performance, social image, value, trustworthiness and commitment.

3. *The Correlation of Brand Loyalty and Brand Extension Factor*
    From the results we can draw, for the firms in the market studied, a set of implications for managing brand extension. The firms interested in extending their brand to other products category should pay special attention to customers' loyalty towards the brand. In other words, the greater the customers' loyalty towards the brand, the higher the customers' acceptance towards brand extension.

    Nevertheless, though the objective of the study is not covering the relationship between brand equity and extension, assessing consumer-based brand equity can indirectly allow cost-benefit analysis of the value of extension. Managers can assess the equity of the core product, and assess the specific brand associations for the extension, and determine the possibility of success. Overall, if the core product's brand associations (performance, social image, trustworthiness) are relevant and positive for the extension, brand extension may be appropriate. Meanwhile, if the core product's image is overall negative for the extension, company or manager should be devoted to building or buying an individual brand loyalty.

Alternatively, for the case in which company are insufficient to build a new brand extension, licensing or acquiring a brand might achieve the desired effect. It would also be possible for firm or manager to perform a cost-benefit analysis to support either a brand extension, or its converse, establishing a solely unique new brand.

Recommendations for Future Research

There are several recommendations and suggestions that can be discussed and potentially used by other researchers in the future study to enhance better outcomes. The summary of recommendations and suggestions are as follows:

1. *Increase the Number of Research Variables*
   Apparently, this research support the notion for at least three situations – 1) relationship between customer-based brand equity dimensions (performance, social image, value, trustworthiness and commitment) with brand equity factor, 2) the relations of brand loyalty and brand equity as well as 3) the correlation between customers' loyalty towards the brand with the customers' acceptance of the extension of the brand. Thus, future research will be required to determine if there are any additional dimensions in measuring customer-based brand equity for instance the perceive quality dimension, guarantee dimension, personal identification dimension and etc.

   Critically, the study on the correlation between brand equity and brand extension can also be explored for the next research in order to enhance the development of brand equity. Additionally, the model should be extended to other branches. The integration of satisfaction dimension/variable for example, is a vital to be studied because the feeling of satisfaction will initially arise before the customer places their loyalty towards the brand.

2. *Increase the Number of Respondents*
   Practically, the large number of respondent in the study might lead to a better and more precise outcome. The outcomes are definitely crucial in reflecting the image and information of the whole population. In addition, by using the large number of respondent, the researcher will be able to get more valid and reliable outcomes instead of using the small number of respondent.

3. *Select a Desired Respondent and Sampling Method*
   Due to limitation of research, overall population of young consumers are only comprised of students from Universiti Utara Malaysia. The researcher suggests that by investing more time, energy and financial resources, the study would be better and more meaningful since better sampling techniques could be used to represent the whole population. Consequently, it is more appropriate for future research to select and identify the desired respondents owning sport sneaker brand and choose suitable location in getting target respondents.

4. *Change the Subject and Reference*
   Further, by having adults, aged around 25 to 50 years old for the sample study in the next research, it will prudently explore the overall perception of customer-based brand equity, loyalty and extension. Changing the brand of sport sneakers according to market demand or replacing other reference entity for example television, computer etc is also useful for the next study.

CONCLUSION

In short, it has been found that it is interesting for firms to analyse the different dimensions that make up the brand equity. Each of these can have a different incidence on the possible consumer responses that determine the advantages that the brand can provide the firm with.

In particular, in the sport sneakers market, it has been observed that the equity of the brand with the performance, social image, value, trustworthiness and commitment dimensions favours the customers' loyalty towards the brand. Sequentially, this brand loyalty has positive effect on the extension of the firm's brand. To gain better outcomes for the next study, ultimately, the researcher's future recommendations are practically useful and valuable to be applied.

REFERRENCES

Arnold, D. (1992). "The Handbook of Brand Management". UK: Pitman Publishing.

Agarwal S. and Sikri S. (1996). "Country Image: Consumer evaluation of product category extensions". *International Marketing Review*, Vol. 13, No. 4, pp. 23-39.

Alreck, P.L. (1999). " Strategies for Building Consumer Brand Preference", *Journal of Product & Brand Management,* Vol. 8, No. 2, pp. 130-144.

Bloemer, J., Ruyter, K.D. and Wetzels, M. (1999). "Linking Perceived Service Quality and Service Loyalty: A Multi-Dimensional Perspective". *European Journal of Marketing*, Vol. 33, No. 11/12, pp. 1082-1106.

Charmasson, H. (1988). "The Name Is the Game: How to Name A Company or Product". Homewood, Illinois: Dow Jones-Irwin.

Christina, K.C.L. and Marshall, R. (1998). "Measuring Influence in the Family Decision Making Process Using an Observational Method". *Qualitative Market Research: An International Journal*, Vol. 1 No. 2, pp. 88-98.

Czerniawki R.D. and Maloney, M.W. (1999). "Creating Brand Loyalty: The Management of Power Positioning and Really Great Advertising". Broadway, NY: AMA Publications.

Delano, F. (1999). "The Omnipowerful Brand: America's #1 Brand Specialist Share His Secrets for Catapulting your Brand to Marketing Stardom". Broadway, NY: AMA Publications.

Duffy,D.L. (1998). "Customer Loyalty Strategies". *Journal of Consumer Marketing*, Vol. 15, No. 5, pp. 435-448.

Ganesh, G. (1997). "Spousal Influence in Consumer Decisions: A Study of Cultural Assimilation". *Journal of Consumer Marketing*, Vol. 14, No. 2, pp. 132-155.

LeBlanc, R.P. and Herndon Jr, N.C. (2001). "Cross-Cultural Consumer Decisions: Consideration Sets – A Marketing Universal?". *Marketing Intelligence & Planning*, pp. 500-506.

Lim, K and O'Class, A. (2001). "Consumer Brand Classifications: An Assessment of Culture-of-Origin Versus Country-of-Origin". *Journal of Product & Brand Management*, Vol. 10, No. 2, pp. 120-136.

Marlin Marissa Malek, A.M. (2001). "A Comparative Study on the Service Quality of Foreign Originated and Local Retail Outlets: ISETAN (Japan) Versus Parkson Grand Department Stores (Malaysia)". Universiti Putra Malaysia: Thesis MBA Graduate School of Management.

Martinez E. and Polo, Y. (1999). "Determining Factors in Family Purchasing Behaviour: An Empirical Investigation". *Journal of Consumer Marketing*, Vol. 16, No. 5, pp. 461-481.

Nga Nguyen and LeBlanc, G. (2001). " Image and Reputation of Higher Education Institutions in Students' Retention Decisions". The International Journal of Education Management, pp. 303-311.

Porter, S.S. and Claycomb, C. (1997). "The Influence of Brand Recognition on Retail Store Image", *Journal of Product & Brand Management,* Vol. 6, No. 6, pp. 373-387.

Roslow, S., Li, T., and J.A.F. Nicholls (2000). "Impact of Situational Variables and Demographic Attributes in Two Seasons on Purchase Behaviour". *European Journal of Marketing*, Vol. 34, No. 9/10, pp. 1167-1180.

Ruyter, K.D., Wetzels, M. and Bloemer, J. (1997). "On the Relationship between Perceived Service Quality, Service Loyalty and Switching Costs". *International Journal of Service Industry Management*, Vol. 9, No. 5, pp. 436-453.

Sakran, S. (2001). "The Name of The Game". Malaysian Business: Superbrands in the Making, KL: Berita Publishing Sdn Bhd, Jan.16th - 31st.

Sze, J. (2001). "Jumping on the Brand Wagon". Malaysian Business: Superbrands in the Making, KL: Berita Publishing Sdn Bhd, Jan.16th - 31st.

Sze, J. (2001). "Branded for Success: A Look at Four Successful Malaysian Brands". Malaysian Business: Superbrands in the Making, KL: Berita Publishing Sdn Bhd, Jan.16th - 31st.

Tanner Jr, J.F. (1998). "User's Role in the Purchase: Their Influence, Satisfaction and Desire to Participate in the Next Purchase". *Journal of Business & Industrial Marketing*, Vol. 13, No. 6, pp. 479-491.

Wilson, E.J. and Woodside, A.G. (1993). "A Two Step Model of Influence in Group Purchasing Decisions". *International Journal of Physical Distribution & Logistics Management*, Vol. 24, No. 5, pp. 34-44.

Wooi Kok, A. (2000). " The Dimensionality of Consumer Decision Making Styles: Comparison between U.S. & Malaysian Young Consumers". Universiti Putra Malaysia: Thesis MBA Graduate School of Management.

YK Ngui, C.(2001). "Winds of Change". Malaysian Business: Superbrands in the Making, KL: Berita Publishing Sdn Bhd, Jan.16th - 31st.

An Exploratory Study of Malaysian Firms Internationalization Strategy: Market Selection, Market Entry Mode and Risk Analysis

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ABSTRACT

This paper explores international market selection process by Malaysian firms that are currently engaged in international business. It identifies screening criteria as well as selection processes for alternative market entry modes in evaluating potential foreign markets. The paper identifies country risk factors faced by the firms when expanding internationally. The findings indicate that Malaysians companies do not follow the step-by-step internationalization process. Suggestion for further research, managerial and theoretical implications are discussed.

INTRODUCTION

International business can be traced back to the earliest civilizations i.e. Egyptians, Greeks and Roman (Yip, 1999). The problems management then faced may be different than what management now perceive. Nevertheless, firms still face many complex questions when considering expansion into overseas markets. Some of the questions relate to selecting alternative international markets, choosing the right market entry mode and identifying and evaluating risks associated with these decisions.

Other than the government's encouragement for Malaysian firms to venture abroad, much of the available literature highlight and identify other motivating factors for firms to undertake export activities or expand globally. These include increase of competition, integration, liberalization in international markets, foreign country regulations, increase domestic competition, profit, growth opportunities abroad, export promotion programs, unsolicited orders from abroad, globalization, and decision maker characteristics (IMF, 1995; Katsikeas and Piercy, 1993; Czinkota *et al,* 1995; Chetty, 1999; Cavusgil, 1984).

Though there are many motivating factors that encourage firms to expand business internationally, there are also factors or barriers preventing firms from expanding globally. Barriers can be insufficient production capacity, limited foreign market knowledge and financial resources, unfavorable foreign exchange rates, political situations, decision makers' level of education, foreign market experience, ability to speak a foreign language, political instability, lack of a well defined legal system, economic fluctuations, foreign exchange controls, and nationalization (Johansson and Vahlne, 1978; Welch and Luostarinen, 1998; Anderson and Gatignon, 1986, Kinsey, 1988).

Firms are faced with many complex question or problems when considering expansion into the overseas markets. Some of the problems are selecting alternative international markets, choosing the right market entry mode, identifying and evaluating risks associated with these decisions. This paper explores the issue of how Malaysian firms consider expansion and the subsequent questions raised, especially in consideration of risk. The results have important implications for government policy, managerial decision-making, and further exploration of theory. The paper is organized as follows to details the investigation carried out: 1. A review of the literature is presented; 2. The methodology is discussed; 3. Findings are presented; 4. Discussion of the findings is offered; and 5. Conclusions and implications are presented.

LITERATURE REVIEW

Concept of Internationalization

The internationalization process of firms has been the subject of numerous studies (Welch and Luostrinen, 1988; Piercy, 1981; Turnbull, 1985; Calof and Beamish, 1995; Johanson and Wiedersheim-Paul, 1975). A comprehensive review of the literature has concluded that there are wide ranges of paths a firm can take in internationalization (Welch and Luostrinen, 1988). Internationalization is the outward movement of a firm's operations or the process of increasing involvement in the international operations (Piercy, 1981; Turnbull, 1985). Others have defined internationalization as the process of adapting the firm's operations and resources to the international environment (Calof and Beamish, 1995) or a firm's engagement in a specific foreign market develops according to one establishment chain i.e. at the start, no export activities are performed in the market, then export takes place via independent representatives, later through a sales subsidiary, and, eventually manufacturing may follow (Johanson and Wiedersheim-Paul, 1975). As this field is well developed, the discussion here will focus on the better-known models of internationalization as the basis of understanding how firms internationalize.

UPPSALA Model of Internationalization

The UPPSALA model says that firms develop their overseas activities over a period of time and in an incremental manner based on their market knowledge development, which can best be explained by the concept of incremental internationalization and psychic distance. Incremental internationalization and concept of psychic distance are the process firms expand first to markets which were physically close and eventually move to distant markets as their knowledge of the market develops over time (Johanson and Vahlne, 1977). The concept of psychic distance is based on Burenstam-Liner's studies that trade is most favored between countries of about the same level of economic development and similar cultural background. UPPSALA model emphasizes on learning by focusing on developing market knowledge and commitment. The model also explains that to reduce risk and overcome uncertainty, a step-to-step process for firms to undergo internationalization is proposed. As firms gain more knowledge of one market over a period of time, it will commit more resources to the market.

Though UPPSALA is a popular model, it is also subjected to much criticism. Researchers suggest that in the earlier part of internationalization; firms may rely much on market experience and therefore, would make incremental adjustments. However, as their international experiences increased, it will allow firms to leapfrog the incremental process within markets rather than doing it gradually (Millington and Bayliss, 1990). Others argue that many international firms may encounter situations whereby the aggregated disadvantages of internationalization involvement outweigh the potential advantage and when such a situation happens, it is possible that the firm may undergo a process of "de-internationalization" and reverse the sequence of international expansion (Luostarinen, 1998). Others state that in reality companies do not follow this model (Bell, 1995).

Transaction Cost Theory

Over the last two decades, the transaction cost analysis has widely been used to explain multinational corporation (MNC's) international investment activities, which include the foreign market entry mode. Transaction Cost Theory has been used to explain how MNC's evaluate whether or not to establish a manufacturing subsidiary or a joint venture in market abroad (Erramilli and Rao, 1993). It is argued that transaction costs are the major determinants of MNC's entry modes to a foreign market and conclude that a MNC tends to choose an entry mode that minimizes transaction cost.

The Industrial Network Theory

Network Theory suggests that a firm's success in entering foreign markets is more dependent on their network relationships with current markets (Johanson and Mattsson, 1998). The Network Theory goes further than the UPPSALA model by suggesting that a company's strategy for entering a foreign market is influenced by a variety of network relationships. Network is defined as sets of two or more connected exchange relationships between customers, suppliers, competitors, and other actors (Axelsson and Easton, 1992). This relationship developed between the various parties will influence a firm's strategic decision to either enter a foreign country or not (Turnbull, 1986).

Business Strategy Approach

Due to increasing trade liberalization, competition, internationalization and globalization, most companies do not follow the evolutionary or step-by-step descriptions of company internationalization process. Companies decisions to enter international markets based on other strategic reasons such as acquisitions, strategic alliance and mergers (Bell, 1995; Reid, 1983; Root, 1987; Porter, 1985). Amongst the considerations for market expansion is based on the best choice among competing business strategies that are guided by nature of market opportunities, firm resources and managerial philosophy (Reid, 1983). Others suggest market attractiveness, psychic distance, market barriers as well as other factors such as international trading history, market size, and export orientation and commitment (Root, 1987), number of competitors (Porter, 1985), both the foreign target market and country environmental factors (Root, 1987; Porter, 1985), company specific and the environment it operates in (Robertson and Chetty, 2000).

International Market Selection Models

A potential reason for business failure is poor selection when firms venture abroad (Knight, 1995). There are two patterns for market selection, namely the expansive and contractive pattern (Johansson, 1997; Root, 1994). Much of the literature on the various international market selection models comprise of three key stages: 1. Screening stages; 2. Identification stages (In-depth Screening); and 3. Final selection (Cavusgil, 1985; Johansson, 1997; Kumar, 1994; Root, 1994).

Screening Stages

Screening is the preliminary stage in the assessment of global opportunities to identify potential markets, which are prime candidates for subsequent in-depth analysis (Douglas and Craig, 1983). Various researchers have suggested using market size and country economic development factors for the identification of potential opportunities in oversea markets (Douglas and Craig, 1983; Rahman, 2001; Cavusgil, 1985; Connolly, 1987; Kumar, 1994; Johansson, 1997; Root, 1994). The main purpose of preliminary screening of markets is to bring about an efficient reduction in the number of countries in need of in-depth examination. (Johansson, 1997: Root, 1994).

Identification or In-depth Screening Stage

The identification stage involves the collecting of industry-specific information such as market factors, market potential estimation, growth rates forecasted, strengths, and weaknesses of competition, entry barriers, and company resources constraints for in-depth investigation and analysis.

Final Selection

This stage involves the final selection of target market countries, after going through the preliminary screening and identification/in-depth screening stages, which best meet the company's objectives in term of sales target, entry cost, risk factors, strategies and company resources.

International Modes of Market Entry

International market entry mode as refers to the institutional arrangement that makes possible the entry of a company's products, technology, human resources, management and other resources into a foreign country (Root, 1994). A company can make entry into a foreign country in various ways: 1. Export its products to target foreign market; 2. Transfer its technology, capital, human resources into a foreign country and manufacture the products there for sale in local markets; 3. Licensing; 4. Joint venture; and 5. Wholly-owned subsidiary (WOS) (Root, 1994; Maignan and Lukas, 1997).

Risk Management

Risk is exposure to the possibility of economic or financial loss or gains, of uncertainty associated with pursuing a course of action (Chapman and Cooper, 1983). Risk can be classified into: 1. Risk Identification; 2. Risk Analysis; and 3. Risk Response. Risk identification is the process that reveals and determines the possible

organizational risks as well as conditions, arising risks (William *et al.,* 1998). Discussion on risk identification refers to the impact of not identifying all risk to the inability of firms in identifying risk (Greene and Trieschmann, 1984; Dickson and Hastings, 1989). Six external environmental risk factors have been identified as important, namely: 1. Politics and Government; 2. Market Potential risk factor; 3. Economics; 4. Culture; 5. Infrastructure; and 6. Legal (Caterora and Graham, 1999; Minor, 1994; Krugman, 1997; Mallen, 1996).

It is the objective of this paper to explore market selection, entry mode and risk analysis of firms in Malaysia. This involves the establishment of reasons why firms would want and need to expand internationally, how did they identify the countries, how they evaluated the market, market entry options and risk analysis based on the discussion of the literature.

METHODOLOGY

A purposeful sampling was conducted for the selection of the companies. The selection of companies from different industries was by a selection method called Intensity Sampling. Intensity sampling refers to choosing subjects that are information rich cases that manifest the phenomenon of interest intensely (Patton, 1990). The companies selected in this study represent five different industries located in Sarawak and West Malaysia and details are provided in Table 1.

Table 1: Industries and Companies Selected

Industry	Number of companies	Percentage
Information Technology	3	23%
Timber	3	23%
Seafood	2	15%
Building Materials	2	15%
Agriculture products	3	23%
Total	13	100%

The respondents were Managers or Managing Directors directly in charge of the firm's export activities. Firms were selected on the basis of their export activities and history. The firms are small to medium sized firms with employees ranging from 25 to 300.

Data was collected by means of in-depth semi-structured interview. Respondents were asked a series of questions drawn from the literature relating to the export activities of their firms. The interviews focused on the firm's initial market selection process, choice of market entry modes, risk analysis, and subsequent, internationalization process. The questionnaires also included managers' perception of risks as an important component of international business strategy and how managers incorporate risk considerations in their decision-making when selecting potential oversea markets. Each respondent was interviewed twice. The first interview introduced the project to the company and acquired some background information. The second interview was the comprehensive in-depth interview. A third meeting was to obtain rankings of factors discussed earlier via a questionnaire.

FINDINGS

Table 2 and Table 3 detail the findings of the study.

Table 2: In-Depth Interview Findings

Factor		%
Reasons for Internationalization	Limited domestic market	84.6
	Attraction of higher profit margin	54
	Increasing domestic competition	38.5
	Top management having previous export experience	23.1
	Unsolicited overseas enquiry	7.7
Screening Process	Initial screening process	100
	In-depth screening process	30.8
Screening Criteria	Economic Indicators	100
	Market Potential	76.9
	Political factors	69.2
	Entry barriers	61.5
	Competition	53.8
	Government policies	46.2
	Legal Factors	38.5
	Bilateral agreement	30.8
	Stability of foreign currency	30.8
	Infrastructure	23.1
	Socio-cultural	15.4
Source of Information	Malaysian Government Agencies	84.6
	Trade Associations	23.1
	International Bodies i.e. UN	30.8
	International Trade Publications	38.5
	In-house research	15.4
	International Consultant	7.7
	Internet	92.3
Market Entry Modes	Wholly owned subsidiary	23
	Joint Venture	7.7
	Exporting	100
Country Risk Factors	Social Cultural	23.1
	Legal	61.5
	Economic	76.9
	Political	92.3

Table 3: Ranking of Factors

Factor		Ranking
Screening Criteria	Economic Indicators	1
	Market Potential	2
	Political factors	3
	Entry barriers	4
	Competition	5
	Government policies	6
	Legal Factors	7
	Bilateral agreement	8
	Stability of foreign currency	8
	Infrastructure	9
	Socio-cultural	10
Mode of Entry	Exporting	1
	Wholly Owned Subsidiary	2
	Joint Venture	3
	Licensing	4
Risk Factors	Political factors	1
	Economical	2
	Legal	3
	Socio-Cultural	4

DISCUSSION OF FINDINGS

The findings of the in-depth personal interview revealed a variety of reasons respondents internationalize. Companies that were interviewed, that have manufacturing plants i.e. timber based, in Malaysia cited limited domestic market size, and higher profit margins overseas as the most stated reasons for exporting. Limited domestic market (84.6%) is the main reason for respondents to expand internationally followed by attraction of higher profit margin (54%). This relates to previous studies that have determined management aspirations to expand oversea are driven by factors such as the desire to achieve higher market growth, higher profit margin and stiffer domestic competition (Cavusgil and Nevin, 1981; Tradenz, 1993/1994; Chetty, 1999). It is also noted that there are a combination of factors that results in a firm starting its internationalization process as found by other researchers (Czinkota and Ronkainen, 1995).

The in-depth interview also revealed that all respondents do not have a written market selection system in place even though they have gone international. However, respondents indicated that they did some sort of initial screening of the country before making the decision to enter the international markets. Only 30.8% of the respondents then carried out an in-depth screening process after the initial screening. Researchers have stressed the importance of a systematic evaluation and selection of foreign markets (Cavusgil, 1985; Johansson, 1997; Kumar, 1994; Root, 1994) but nevertheless comprehensive, in-depth screening or study of the target markets is rare (Bjorkman and Eklund, 1991).

Respondents however had specific criteria to screen and select potential countries and markets. These include: economic indicators (100%) such as GDP, GNP, Per Capita Income, foreign country's balance of trade, inflation, foreign reserve; market potential analysis (76.9%) e.g. market size, market growth potential; political factors (69.2%) e.g. political stability, democracy, labor unrest and foreign government ability to deal with, rebellion, political kidnapping, riots, guerrilla war; entry barriers (61.5%) e.g. taxes, tariffs, quotas, duties, local content; competition (53.8%); government policies towards foreign companies (46.2%); legal factors (38.5%) e.g. products standards imposed by foreign countries, visa requirement and any restrictions imposed on travel by foreign government, legal system; stability of foreign exchange (30.8%); bilateral trade arrangement with Malaysia (30.8%); infrastructure (23.1%) e.g. costs, efficiency and mode of transportation to foreign country/market; and socio-cultural (15.4%) e.g. racial harmony or friction, number of different cultural groupings such as ethnic, religious, racial, language, lifestyles and custom. A ranking was also obtained and detailed in Table 3. The findings on the criteria used by the respondents in this study are quite close to the findings carried out by other researchers in international market screening literature such as the use of market size and level of economic development (Young *et al.,* 1989; Litvak and Banting, 1973; Ball and McCullochst, 1993; Root, 1994).

Respondents in this study have also been asked to indicate the sources of information their companies use to perform the screening. 92.3% of respondents used the Internet to search for information about the country during their initial market screening process followed by getting information from Government Agencies (84.6%) such as Miti, Ministry of Primary Industries, MALTRADE.

All respondents used exporting (100%) as the mode of entry into foreign countries, followed by wholly owned subsidiary (23%) and joint ventures (7.7%). None used licensing (0%). It appears that the respondents were pragmatic because most firms wanted to have a low risk entry mode. Only one Timber Company and two IT companies involved in this study had wholly owned subsidiaries operating in foreign country. The reasons given by them for setting up overseas subsidiary are because they wanted to have better control of the markets.

Respondents in this study rated political factors (92.3%) as the most important risk factor followed by economical (76.99%), legal (61.5%) and socio-cultural factors (23.1%). Table 3 shows the ranking of importance for the risk factors. Respondents in this study were asked to rate the level of risk their companies would use when deciding to accept or reject a country or market. All respondents did not have any concrete answer for this question as they did not have a formula to calculate the required level or did not have a written rule to guide them. From the study, respondents in this study are counting on their experience with regards to risk factors, whether to accept or reject a market or country. Respondents also highlighted that they will normally check with their bankers and relevant government ministries on the countries they wish to do business with. Should the advice from their bankers and government officials be negative, they would take the advice and not take the risk of entering the countries concern.

CONCLUSIONS

The findings of this research suggest that respondents do not follow the international market selection models (Cavusgil, 1985; Johansson, 1997; Kumar, 1994; Root, 1994). Many respondents do not perform in-depth screening process before deciding on a market to enter. Most of the screening done by respondents on country risk factors and markets are inadequate. They do not have a concrete screening plan nor do management of these firms determine risk factors in detail and evaluate them. It is still mainly based on gut feeling and advice of others. There are still firms that internationalize just because of demand from overseas.

This exploratory study provides further questions on internationalization of Malaysian firms that can be further explored in a more detailed manner. It tests current knowledge against what is being carried out in the business world. This can now be used to formulate further research into internationalization of Malaysian companies.

It must also be highlighted that there are limitations in this research. Firstly, it is an exploratory study that utilizes only thirteen respondent companies. Further research can increase this sample size to add reliability, validity, and generalizability of the study. Further research can also incorporate the findings into a survey questionnaire and distribute it to a larger sample.

REFERENCES

Anand, J and Delios, A. (1996), 'Competing Globally: How Japanese Mncs Have Matched Goals and Strategies In India and China", *Columbia Journal Of World Business*, Vol. 31, Fall, PP 50-62

Anderson, E and Gaignon, H (1986) "Modes Of Foreign Entry: A Transaction Cost Analysis and Propositions", *Journal Of International Business Studies*, Vol. 17, No 3, Pp1-26

Axelsson, B. and Easton, G. (Eds), (1992), *Industrial Network-A View On Reality*, Rout Ledge, London

Ball, D.A. and Mcculloch, W.H.Jr (1993), *International Business Introduction and Essentials*, 5thed. Richard D. Irwin, Homewood, IL.

Bjorkman, I and Klund, M (1991) "Entering Foreign Markets: An Analysis Of The Market Entry Modes Used By Finnish Direct Investors In Germany", In Vestegaard, H (Ed), An Enlarged Europe In The Global Economy, Vol. 2, European International Business Association, Copenhagen.

Burenstam-Linder, S., An Essay On Trade and Transportation, Almgvist And Wilksell, UPPSALA 1961

Calof, J. and Beamish, P. 91995), "Adapting To Foreign Markets: Explaining Internationalization", *International Business Review*, Vol. 4, No.2, Pp 115-31

Cateora, P.R. and Grahman, J.L (1999), *International Marketing* 10th Ed, Irwin Mcgraw-Hill, Boston MA

Cateora, P.R (1996*), International Marketing*, 9thed, Irwin, Chicago, IL

Cavusgil, S.T and Nevin, J.R. (1981), 'Internal Determinants Of Export Marketing Behaviors", *Journal Of Marketing Research*, Vol. 18, February, P114-119

Chapman, C.B and Cooper, D.F. (1983), "Risk Analysis: Testing Some Prejudices", *European Journal Of Operational Research*, Vol. 14, Pp 238-47

Chetty, S (1999), 'Dimensions Of Internationalization Of Manufacturing Firms In The Apparel Industry", *European Journal Of Marketing*, Vol. 33 No. 112, PP 121-42

Connolly, S.G. (1987), Finding, Entering and Succeeding In A Foreign Market, Prentice-Hall, Englewood Cliffs, NJ

Czinkota, M.R., Ronkainen, J.A. and Tarrant, J.J. (1995), The Global Marketing Imperative: Positioning Your Company For The New World Of Business, NTC Publishing, Chicago, IL.

Czinkota, M.R. and Ronkainen, I.A. (Eds) (1995), Readings In Global Marketing, The Dryden Press, London

Dalgic, T and Heiblom, R (1996), 'Educator Insights: International Marketing Blunders Revisited-Some Lessons For Managers", *Journal Of International Marketing*, Vol4 No.1., Pp81-91

Dickson, G.C.A. and Hastings, N.J. (A989), Corporate Risk Management, Witherby & Co., London

Dickson, P.R. and Giglierano, J.J. (1986), "Missing The Boat and Sinking The Boat: A Conceptual Model Of Entrepreneurial Risk", *Journal Of Market*, Vol. 50, No.3, July, Pp 58-70

Driscoll, A.M. (1995), "Foreign Market Entry Methods", In Paliwoda, S.J. And Ryans, J.K. Jr (Eds), *International Marketing Reader*, Routledge, London

Douglas, S.P And Craig, S.C (1983), "Advances In International Marketing", *International Journal Of Research In Marketing*, Vol L9. No.1 Pp 291-318

Erramilli, M.K. and Rao, C.P (1993), "Service Firms' International Entry Mode-Choice: A Modified Transaction-Cost Analysis Approach", *Journal Of Marketing*, Vol.57, July, Pp19-38

Greene, M.R. and Trieschmann, J.S. (1984), Risk and Insurance, Southwestern Publishing Co., Cincinnati, OH

Hill, F.M. 1993, "Research Methodology and The Management Disciplines: The Need For Heterogeneity." IBAR. Vol. 14, PP46-56

IMF (1995), Directions Of Trade Statistics Yearbook, IMF Publication Services, Washington, DC

Johansson, J. and Mattson, L.G. (1998), "Internationalization In The Industrial Systems-A Network Approach", In Hood, N. and Vahlne, J.E. (Eds), Strategies In Global Competition, Croom Helm, Beckenham.

Johansson, J and Vahlne, J.E (1977) "The Internationalization Process Of The Firm-A Model Of Knowledge Development and Increasing Foreign Market Commitments", *Journal Of International Business Studies*, Spring/Summer, Pp 23-32

Keegan, W.J (1995), *Global Marketing Management*, 5th Ed. Prentice-Hall, Englewood Cliffs, N.J.

Kinsey, J., Marketing In Developing Countries, Macmillan Education, Basingstoke, 1988

Knight, G.A. (1995), 'Educator Insights: International Marketing Blunders By American Firms In Japan-Some Lessons For Management", *Journal Of International Marketing*, Vol. 3, No.4, Pp 107-29

Krugman, P (1997), Development, Geography, And Economic Theory, MIT Press, Philadelphia, PA

Litvak, I.A. and Banting, P.M. (1973), "A Conceptual Framework For International Business Arrangement", In Seithi, S.P. and Sheth, J.N. (Eds), *Multinational Business Operations Marketing Management*, Vol. 3, Goodyear Publishing, Pacific Palisades, CA, PP85-95.

Maignan, I. and Lukas, B.A. (1997), "Entry Mode Decisions: The Role Of Managers' Mental Models", *Journal Of Global Marketing*, Vol. 4, PP 7-22

Millington, A.I and Bayliss, B.T (1990), 'The Process Of Internationalization: UK Companies In The EC," *Management International Review*, Vol. 30 No 20, PP 151-61

Onkvisit, S and Shaw, J.J (1993), *International Marketing: Analysis &Strategy*, 2nd Ed., Macmillan, New York, N.Y

Minor, MS (1994), "The Demise Of Expropriation as An Instrument Of Old LDC Policy, 1980-1992", *Journal Of International Business Studies*, Vol. 25, No.1, Pp 177-88

Patton, M.Q. (1990), Qualitative Evaluation and Research Methods, 2nd Ed., Sage Publications, Newbury Park, CA

Piercy, N.F (1981), 'Company Internationalization: Active and Reactive Exporting", *European Journal Of Marketing*, Vol. 15 No. 3, Pp 22-40

Porter, M.E. (1985), Competitive Advantage: Creating and Sustaining Superior Performance, The Free Press, NY

Rahman, S.H. (2001), "The International Market Selection Process: A Study Of Successful Australian International Firms", *Journal Of International Marketing And Exporting*, Vol. 6, No.2. PP 150-60

Rainer, R.K, Snyder, C.A. and Carr, H.H (1991), "Risk Analysis For Information Technology", *Journal Of Management Information Systems*, Vol. 8 No.1, Pp129-47

Robertson, C. and Chetty, S.K. (2000), "A Contingency-Based Approach To Understanding Export Performance", *International Business Review*, No. 9, Pp 211-35

Reid, S (1983), "Firm Internationalization, Transaction Costs And Strategic Choice", *International Marketing Review*, Winter, Pp 44-56

Root, F.R. (1987), Entry Strategies For International Markets, DC Heath, Lexington, MA

Russow, L.C. and Okoroafo, S.C. (1996), "One Way Towards Developing A Global Screening Model", *International Marketing Review*, Vol. 13, No.1. PP 46-64

Schlegelmilch, B.B., Diamantopoulos, A and Tse, K. (1993), 'Determinants Of Export Marketing Research Usage: Testing Some Hypotheses On UK Exporters", In Maker, K.J (Ed), Perspectives On Marketing Management, Vol. 3, John Wiley & Sons, New York.

Tradenz (1993/1994), 'Stretching For Growth-Building: An Export Strategy For New Zealand", Available at: Www.Tradenz.Govt.Nz

Turnbull, P.W (1985), "Internationalization Of The Firm: A Stage Process Or Not?" Paper Presented at A Conference On Export Expansion and Market Entry Modes, Dalhousie University, Halifax, October.

Turnbull, P.W (1986), "Tri-Partite Interaction: The Role Of Sales Subsidiaries In The International Marketing", In Turnbull, P.W and Paliwoda, S.J (Eds*), Research In International Marketing*, Croom Helm, London.

Welch, L.S and Luostarinen, R (1988), "Internationalization: Evolution Of A Concept", *Journal Of General Management*, Vol. 14 No.2, Pp 34-55

Wells, L.T (1969) "Test Of A Product Cycle Model Of International Trade", *Quarterly Journal Of Economics*, February, Pp 152-62

Williams, C.A., Smith, M.I. and Young, P.C. (1998), Risk Management and Insurance, Irwin Mcgraw Hill

Yip, G.S. (1992), Global Strategy, Managing For Worldwide Competition Advantage, Prentice-Hall, Englewood Cliffs, NJ.

Young, S (1990), "Internationalization: Introduction and Overview*", International Marketing Review*, Vol 7, No. 4, Pp 5-10

Young, S., Hamill, J., Wheeler C. and Davis, J.R. (1989), *International Market Entry and Development*, Prentice-Hall, Englewood Cliffs, N.J.

Complaining Behaviour and Customer Defection:
Will Customers Ever Leave Without a Word?

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ABSTRACT

Marketing literature has not come to a consensus on whether customers will always communicate their dissatisfaction with the organisation's service quality to the firm before abandoning it. Much of organisational practices implicitly assume they will, which is evident in their strong emphasis on the number of complaints received from customers in measuring the level of customer satisfaction. Some firms have even taken a more dangerous position of assuming that "no complaint means satisfied customers." In this research, the authors examine the relationship between public complaint (i.e. complaining to the organisation) and private complaint (complaining to family members and friends) on customer defection. A survey of 218 randomly selected bank customers in Kota Kinabalu, Sabah was carried out. The results show that both public and private complaints are associated with defection. In other words, while some customers will leave with a word to the bank, others will leave without a word. The former group is not giving their bank a chance to know that they are unhappy with its service quality. The results challenge the rationale behind the use of zero complaint as a measure of service quality level and customer satisfaction. Theoretical and marketing implications of the findings are discussed.

INTRODUCTION

Retention of customers is an important issue, particularly in a service-oriented industry because losing a customer can be very costly. The results of customer defection include decrease in revenue, higher costs in attracting new customers, loss of free advertising through positive Word-of-Mouth and decrease employee retention (Colgate & Norris, 2001). It is especially identical as researchers found that the cost to gain a new customer could be as high as five times to retain an existing one (Fundin & Bergman, 2003; Desatnick (1988) in Boldgett *et al.*, 1995). Reichheld and Sasser (1990) demonstrated that a 5% decrease in customer defections could translate into 25-85% increase in profits, depending on the service industry (Lee & Cunningham, 2001). Colgate and Hedge (2001) pointed out that losing customers could have a negative effect on a bank's market share too. Thus, company should try to retain customers as the key to survive and for the long-term growth of the company.

Customer retention is driven by customer satisfaction (Roland & Zahorik, 1993). So, ensuring customer satisfaction is a non-debatable way to retain customer. Nevertheless, all companies experience some degree of customer dissatisfaction (Fisher *et al.*, 1999). Since dissatisfaction would lead to consumer defection, the understanding of consumer behaviour following the dissatisfaction is a crucial issue. It is important to know how consumer will behave after feeling dissatisfaction on the product or service received. All types of consumer responses to express the dissatisfaction after a purchase are regarded as consumer complaint.

In the past three decades, many researchers have conducted studies on consumer complaint behaviour, such as Liu and McClure (2001); Kim *et al.* (2003); Heung and Lam (2003); Nyer (2000); Fisher *et al.* (1999); Eccles and Durand (1998); Bennett (1997); Broardbridge and Marshall (1995) and Boldgett *el al.* (1995). Nevertheless, most of the studies were conducted in United States, and relatively little emphasis in an Asian context (Keng *et al.*, 1995). Hence, study on the consumer complaint behaviour in Asia, particularly Malaysia, will give further insight into the understanding of consumer post purchase behaviour.

LITERATURE REVIEW

Dissatisfaction

In order to better understand the word "dissatisfaction", the definition of satisfaction is being reviewed. Satisfaction is determined to a significant extent by the disconfirmation or confirmation of consumer expectations (Bearden & Oliver, 1985; Cornwell *et al.*, 1991).

According to Hsieh (1996), the disconfirmation model has been widely accepted with many researchers trying to define satisfaction further using this model. The disconfirmation model focuses on the condition where the product disconfirms expectation. If the product disconfirms expectation by exceeding it, customer experience satisfaction; in contrast, if product disconfirms expectation by falling short of expectation, dissatisfaction arouses (East, 1997; Stewart, 1998a).

Michel (2001) defined dissatisfaction among the servicing industry as the disconfirmation of service expectation caused by the services failure. The expectations are determined by factors such as advertasing, prior experience, personal needs, Word-of-Mouth and the imaga of the service provider (Michel, 2001), while service failure is the problem that a customer has with a service (Colgate & Norris, 2001).

Peyrot (1994) explained that consumers form pre-purchase expectations regarding a product and will form evaluation of this product in the post purchase stage, consumer will generate dissatisfaction if product do not meet expectation. Broadbridge and Marshall (1995) provided similar definition by trying to relate satisfaction with the quality of product. They stated that consumer dissatisfaction is the result of the discrepancy between expected and realized performance, with an attribute.

Consumer Complaint Behaviour

Consumer complaint behaviour is also known as "consumer complaint responses" (Singh & Widing, 1991). Crie (2003:61) defined that consumer complaint behaviour is a process that "constitutes a subset of all possible responses to perceived dissatisfaction around a purchase episode, during consumption or during possession of the goods or services". He argued that consumer complaint behaviour is not an instant response, but a process, which does not directly depend on its initiating factors but on evaluation of the situation by the consumer and of its evolution over time.

Broadbridge and Marshall (1995) explained that consumer complaint behaviour is a distinct process, which begins when the consumer has evaluated a consumption experience (resulting in dissatisfaction) and ends when the consumer had completed all behavioural and non-behavioural responses.

Singh and Widing (1991) proposed a definition that consumer complaint behaviour included all potential behavioural responses that a consumer may utilise to deal with his/her dissatisfaction. Singh (1990b) identified consumer complaint behaviour as the consumer dissatisfaction response style. Thus, complaint is actually the response following the consumer dissatisfaction. These responses/actions include among others, switching patronage, telling friends and family and complaining to a consumer agency.

In order to better categorised the consumer complaint action, previous researchers have suggested a few typologies in categorising the consumer complaint action based on the responses styles. Mason and Himes (1973) categorised the response styles into action group and no action group. The consumers who complain to member/s of distribution (e.g. retailer or seller) with intention to seek relief are classified as action group. While others, are classified as no action group.

Another study done by Warland *et al.* (1975) categorised the consumer complaint behaviour into upset action and upset no action. Consumers might not complain, even though they are dissatisfied, he regarded them as the upset but no action group. Otherwise, they are in upset action category. This classification still remains relevant and basic to the study of consumer complaint behaviour till today, even though subsequent researchers have different labels for these styles, such as complainers and non-complainers and activists and non-activists (Singh, 1990b).

As stated earlier, action taken by consumers are not only the complaint to the seller, but also include warning families and friends, stop patronising, divert to mass media, complaint to consumer council and complain by writing a letter to management (Heung & Lam, 2003). Therefore, a two-level hierarchical classification (public or private action) was proposed by Day and Landon in 1976, with the intentions to distinguish the consumer complaint response (Cornwell *et al.*, 1991; Singh, 1990a).

Public action refers to the direct complaint actions to the seller or a third party (e.g. consumer agency or government), which included seeking redress directly from retailer or manufacturer, and taking legal action (Bearden, 1983; Bearden & Oliver, 1985; Cornwell *et al.*, 1991). The public actions that could be taken by consumer included verbal complain to retailer/manufacturer, write comment card or complaint letters, write to newspaper or complain to consumer council (Heung & Lam, 2003).

Private action indicates that complaint is privately through negative Word-of-Mouth communications to family and friends or the decision not to repurchase the product or services again or boycott store (Bearden, 19836; Broadbridge & Marshall, 1995; Cornwell *et al.*, 1991). Private actions generally do not get the direct attention of the seller and thus could have a serious impact on sales and profitability (Heung & Lam, 2003). Bearden and Oliver (1985:228) pointed out that "private complaint has no effect on the firm's responses, but may reinforce negative attitudes through the process of consensual validation whereby individuals seek confirmation of their feelings by selectively exposing themselves to agreeable others". It is important to know that a consumer may only either involve in one action (the public or private complaint) or will involve in both public and private complaint (Kolodinsky, 1995).

Defection

Customer defection is also termed as "customer exit" or "switching behaviour". In Colgate and Hedge (2001), the terms switching, defection and exit are used interchangeable, which showed that the terms have similar definition. Defection can be defined as customers forsaking one product or service for another (Garland, 2002). The customer decides not to purchase a product or service again.

Crie (2003) defined defection as an active and destructive response to dissatisfaction, exhibited by a break of the relationship with the object (brand, product, retailer, supplier…). According to Colgate and Hedge (2001), defection is the customer's decision to stop purchasing a particular service or patronising the service firm completely, which is a gradual dissolution of relationships due to problem(s) encountered over time. They explained that defection is a complex process following customers faced with a/multiple problem(s).

Stewart (1998a) in studying the customer defection in the banking industry tried to define defection as the ending of the relationship between customer and bank. He explained further that the relationship is marked by a customer "run down" the account to a negligible balance and have no future transaction or formally close the account.

The Relationship between Dissatisfaction, Consumer Complaint Behaviour and Defection

As discuss earlier, consumer complaint behaviour is widely define as the actions that resulted from the feeling of dissatisfaction. Therefore, dissatisfaction is identified as the independent factor that is necessary to trigger consumer complaint (Singh & Widing, 1991; East, 1997; Heung & Lam, 2003; Volkov *et al.*, 2002). Consumer will not take any complaint action if they are satisfied. And thus, it is assumed that conusmer complaint action is the dissatisfied action taken by consumers.

Consumers who are dissatisfied may not take any complaint actions, and those consumers who do take complain actions probably are not the only consumers who are unhappy (Warland *et al.*, 1975). Consumer might take various types of complaint actions such as complaint verbally either directly or indirectly, writing complaint directly to seller or complaint directly to third parties (e.g. consumer council or mass media). Since consumer complaint actions should be categorised for better interpretation, the two level categorisations suggested by Day and Landon in 1976 is used.
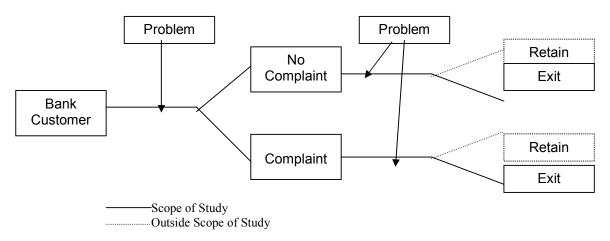
Malaysians generally are characterised by the Malaysian culture of face saving and harmony. Malaysians are less forthright in expressing views and opinions and giving negative feedback can be awkward and difficult as indirectness is the more acceptable norm than directness in day-to-day behaviour (Asma, 1996). Thus, the choice of complaint might be much different from other culture. It is expected to find some differences in the Malaysian consumer complaint behaviour. It is also relevant to believe that Malaysian customer might be more willing to engage in private complaint rather than public complaint because customer who choose public complaint will have to confront directly with service provider, which is not encouraged in the culture.

Defection is always defined as one of the complaint responses, which was defined as exit behaviour by Singh (1990a) or included as one of the private responses in complaint by Day and Landon (1976). Most previous research included defection as a style of complaint, and relatively less study done on defection as a single variable.

Anyway, Stewart's (1998b) review of research into exit behaviour suggested that exit is a process whose nature is best captured and is dependent upon a trigger activating the exit process. His statement implied that defection is a dependent variable and is trigger by some other factors.

Crie (2003) also argued that defection could be a substitute for and complement to a complaint. He explained that customer might choose not to complain but leave the company, or complain and leave after that. In others word, consumers who complain about their dissatisfaction may either choose to exit or continued patronage behaviour (Arnould, 2004; Sheth *et al.*, 1999). His comment suggested that there is a relationship between consumer complaint and defection. Nevertheless, no literature was found to discuss the relationship between complaint action and defection. The study of the relationship between complaint action and defection is the pioneer in the post-purchase consumer behaviour.

Figure 1: Retail Banking Studies Supporting Keaveney (1995)

————Scope of Study
................Outside Scope of Study

Source: Colgate and Hedge (2001)

In Colgate and Hedge (2001), they proposed a framework that showed the relationship between complaint/no complaint with the exit (defection) behaviour in a setting of the retail banking industry. Figure 1 shows that the framework proposed by them. In this framework, they are trying to identify the problems that lead to exit. This framework suggests an important relationship between complaint and defection, in which defection is a dependent variable. But the focus of their research is the problems that lead to exit among the customers. In another word, they fail to investigate the important relationship between complaint and exit as in their proposed framework.

Previous research proved that complaint has impact on the defection intention by the customer. Arnould (2004) pointed out that dissatisfied customers who do not complain are more likely to discontinue purchase, which means, they are more likely to defect than those who complain. In other words, majority of complaint customers will continue to buy the product or service, compare to those who are dissatisfied but do not bother to complain (Sheth *et al.*, 1999). Buttle & Burton (2002) also stated that non-complainers were found to be the least loyal customers even more disloyal than complaining dissatisfied customers whose problems were not resolved.

For complaint customer, defection is often the last resort after complaint has failed (Kim *et al.*, 2003; Colgate & Hedge, 2001). So they will likely choose to stay after the complaint is resolved. In other occasions, customer defection will increase in accordance with complaint. According to Colgate and Hedge (2001), up to 80% of customers do make an effort to complain to the bank prior to defect in the retail-banking sector.

Watkins and Liu (1996) demonstrated that positive consumer perceptions of supplier responses to complaints resulted in high satisfaction and increased repurchase intentions and behaviours. This suggests that for some consumers, voice complaint to seller (and depending to supplier response) influence the probability of exit.

RESEARCH METHODOLOGY

The research framework (Figure 2) is adapted from Day (1977) and Colgate and Hedge (2001), and modified to suit the setting of this study. This framework focuses on the relationship between consumer complaint and defection, in which defection is being treated as an individual variable.

Figure 2 : Research Framework

The definition of dissatisfied complaint action in this study is adopted from Singh and Widing (1991). Dissatisfied complaint action is defined as all potential behavioural responses that a consumer may utilise to deal with his/her dissatisfaction. Behavioural responses involving all actions intended to express dissatisfaction (Liu & McClure, 2001). The actions were categorised into public and private complaint for further investigation based on the categorisation suggested by Day and Landon (1976).

HYPOTHESIS

Based on the framework, three main hypotheses were developed.
To investigate the relationship between dissatisfied complaint action and defection.

Hypothesis 1 (H1)
The higher the dissatisfied complaint action (i.e. public complaint and private complaint), the higher the customer defection.

Hypothesis 1a (H1a)
The higher the public complaint, the higher the customer defection.

Hypothesis 1b (H1b)
The higher the private complaint, the higher the customer defection.

The data were collected from individual customer of Banking and Finance industry in Kota Kinabalu, Sabah, Malaysia. Questionnaire was used as data collection instrument in this study. The questionnaire was self-administrated by respondent, the respondents were given two weeks time to answer the questionnaire. The questionnaire was written in English and was translated back-to-back to Malay and Chinese Language, to enable consumers who do not understand English well to answer the questionnaire. The questionnaire was re-checked to ensure that the translation copy is correct.

The questionnaires were constructed based on the questionnaires used in previous researches. Previous researchers have proven that these questionnaires are useful in analysing the variables in this model. The items for dissatisfied complaint action and defection were adapted from Volkov *et al.* (2002) and Liu and McClure (2001). These items were measured on a five-point Likert Scale ranging from 1-5.

RESULTS AND DISCUSSION

The Cronbach Alpha test was done to assess the internal consistency reliabilities of the scales. The Cronbach Alpha value for seven items in public complaint is 78%, indicated that the measures are reliable. The Cronbach Alpha value for three items in private complaint is 69%. While for the four items in defection, the value is 70%. The reliability test for both private complaint and defection showed that the measures are quite reliable. Detail of the test results are tabulated in Table 1.

Table 1: Reliability Test of Variables

Variables	No. of Items	Cronbach Alpha
Public Complaint	7	.7799
Private Complaint	3	.6915
Defection	4	.6957

The means and standard deviations of variables are tabulated in Table 2 below. The means are all above the middle range of the scale. The mean of public complaint is 3.10 and standard deviation is .70. While for the private complaint, mean is higher at 3.64 and standard deviation is .78. The difference in means implied that customers are more likely to complaint privately than publicly. The mean and standard deviation of defection are 3.53 and .72 respectively.

Table 2: Descriptive Statistic of Variables

Variables	N	Mean	Std. Deviation
Public Complaint	218	3.10	.70
Private Complaint	218	3.64	.78
Defection	218	3.53	.72

The multiple regression analysis was employed to test the construct relationships (i.e. between the dissatisfaction complaint action and the defections). The assumptions of the regression, i.e. autocorrelation, normality, homoscedasticity, multicollinearlity and linearity of independent variables were verified before making any interpretation of the statistical result. The degree of multicollinearity and its effect on the results was examined to ensure that the regression results are valid. The two-part process (condition indices and the decomposition of the coefficient variance) was employed and comparisons made with the conclusions drawn from the variance inflation factor (VIF) and tolerance values.

Hypothesis 1 (H1)
The higher the dissatisfied complaint action (i.e. public complaint and private complaint), the higher the customer defection.

Table 3 shows the results of the regression analysis used to determined the relationship between the dissatisfied complaint actions (public and private complaint) and defection. Since the tolerance value and VIF value were .914 and 1.095 respectively, the assumption of multicollinearity is fulfilled. Significant F change = .003 also showed that the model was fit.

The results show that private and public complaint contribute significantly (F = 42.078; p = .0000) at the 5% significance level and predict 28% of the variations in defection. Thus, Hypotheses 1 is accepted. Higher dissatisfied complaint action (i.e. public and private complaint) will lead to higher customer defection.

Table 3: Regression With No Moderating Effect

Independent Variables	Beta Coefficients	t-value	p-value	Tolerance	VIF
Public Complaint	.242	3.990	.000	.914	1.095
Private Complaint	.407	6.722	.000	.914	1.095
R² = .282	Significant F Change = .000				
F = 42.078	Sig. F = .000				

Hypothesis 1a (H1a)
The higher the public complaint, the higher the customer defection.

Details of the result as in Table 3 showed that public complaint is significantly associated with defection (t = 3.990; p = .000). Beta Coefficient of Public complaint is .242. thus, hypothesis 1a (H1a) is accepted. Higher public complaint will lead to higher defection.

Hypothesis 1b (H1b)
The higher the private complaint, the higher the customer defection.

Result in Table 3 indicates that private complaint is significantly associated with defection (t = 6.722; p = .000). Beta coefficient is .407. thus, hypotheses 1b (H1b) is accepted too. It is accepted that the higher the private complaint, the higher the customer defection.

Hypothesis 1 (including hypothesis 1a and 1b) is fully supported, which indicates that there is a positive linear relationship between complaint and defection. Complaint (public and private) explained 28.2% of total variance in defection. According to Rowland *et al.* (1991), most of the social science researches have average variance that may be as low as 15% explained variance. Thus, this value is high. Dissatisfied customers may likely defect irrespective of whether they complained publicly or privately. It showed that whether they voiced the problems directly to the bank or to family or friends, they will choose to defect somehow if the source of dissatisfaction is not cleared.

The Beta coefficient of public compliant is .242 and private complaint is .407. These results show that the influence of private complaint on the defection is much higher than public complaint. In other word, the customer will complain more privately rather than publicly before defecting. Ndubisi (2003a) has shown that dissatisfied customers may not complain to the service provider and thus customers blame a company when served poorly, and rather than complain directly to the company, they typically patronise another (choose to defect). If customers do not voice out to the bank, bank has no chances to rectify the problems, the customer

might just leave the bank. Therefore, banks which recognise this fact must make concerted, capable and collective efforts for the organisation to deliver value to customers (Ndusidi, 2003b). In contrast, if the customers voiced out, the bank might have a chance to solve the dissatisfaction, and hence, will help to satisfy the customer again and reduce the defection rate. Thus, private complaint has stronger influence on defection than public complaint and it is also more dangerous for service provider.

Since private complaint is a form of negative Word-of Mouth, it will definitely have impact on other customers' perception towards the bank. The bank might not be aware of the complaint as well because customer prefer not to voice out their dissatisfaction to the bank. In the long run, private complaint might bring big disaster to the bank.

IMPLICATION

Implication to Manager

The implications of this study to managers are as follow:

Firstly, managers should understand that zero complaint is not a good measure of customer satisfaction because dissatisfied customers might not complaint directly to them. The dissatisfied customers might choose to complaint to friends and family only. Thus, the managers will not know that the customers were dissatisfied until the customers defect from the bank. At which point it is too late for a manager to do anything.

Secondly, the managers should recognise the seriousness of negative Word-of-Mouth on the bank's reputation. The result showed that customers are more likely to complaint privately to friends and relatives. In this case, other customers could be influenced and they too may develop a negative perception of the bank's service. In the long run, the image of bank is ruin. In order to solve this problem, the manager must encourage the customers to complain directly. Ensuring that a dissatisfaction communication channel is available alone is not enough to encourage the customers to make full use of it. Managers should also ensure that the customers are aware of this channel and willing to use it.

Managers must also let out the impression that complaints are viewed positively (by the bank) as a chance by the customer to them to improve. This impression is important among Malaysian customers who may erroneously view direct complaint to the bank as an act of confrontation. Managers and other employees should show clear appreciation for customers who choose to complain, and even reward those customers who stay on and assist the bank to resolve any service shortfall. Manager should also not wait for complaints to drive service improvements. Such reactive move lacks the capacity to check defection, instead a proactive step should be taken which will include constant improvement on quality even when there is no complaint. Since the cost of serving a loyal customer is five to six time less than the cost of attracting and serving one new customer, every concerted effort within the organisation should be made to discourage or completely eliminate defection.

Implications to Researchers

The implications of this research to the researchers are discussed in the following paragraphs:

Firstly, this study concludes that there is a strong relationship between dissatisfied complaint action and defection. In the previous researches, defection was viewed as part of the complaint, which is inaccurate. Thus, researchers should view defection as a single variable that is strongly correlated with dissatisfied customer complaint action. This research suggests a new dimension in the consumer complaint behaviour.

Secondly, researchers should take into account that zero complaint is not always an indication of customer satisfaction and superb service quality. Researchers have to avoid the rule of measuring customer satisfaction based upon level of customer complaint and develop other more reliable measures.

SUGGESTION FOR FUTURE RESEARCH

For the benefits of researchers who intended to do future research on this area, some suggestions are included here:

Firstly, it is suggested to increase the sample size of the study. Future research should try to include other major cities in Malaysia as well, such as Penang, Kuala Lumpur, Johor Bharu and Kuching. Thus the study will better represent and interpreted as customer complaint behaviour in Malaysia.

Secondly, the sampling technique should be improved to obtain a better sampling of the population. Increasing the number of bank involved in the randomly sampling technique will help to improve the accuracy of the finding.

Thirdly, it is also interesting to know the view of the management of banks towards consumer complaint, especially public complaint, which the bank was given a chance to rectify. It is believe that the response of bank towards complaint will respectively have impact on the relationship between complaint and defection as well as the strengths of public and private complaints in determining defection. Thus, future research should generate a new framework with this variable as moderator to better interpret defection among customers.

CONCLUSION

This research focuses on the consumer post purchase behaviour. This study has given a new dimension to the research in marketing by suggesting a new relationship between complaint and defection. This is clearly value additive to knowledge in this area, with immense benefits to researchers and practitioners. Besides that, the setting of this study in the local context gives managers valuable suggestions on how to manage defection and customer retention in the Malaysian banking sector.

In order to retain customers, the bank should ensure that their customers are satisfied. The satisfaction level of customers must be addressed. Failing to do so will lead to a serious condition, in which the customers will communicate something negative about the bank to others. Consequently, the image of the bank will be negatively positioned in the customers' mind.

The banks must encourage customers to complaint directly to them, in order for the bank to survive. Although the task may be a little bit tougher following the challenges brought by Malaysian culture. Nevertheless, it is possible to get customers to complain directly to the bank and give the bank a chance to improve. Managers therefore should strive to eliminate or at least minimise private complaints and in its place nurture direct or public complaint behaviour among customers.

REFERENCES

Arnould, E. J. 2004. *Consumers.* (2nd edition). U.S.A.: McGraw-Hill Companies, Inc.

Asma Abdullah, 1996. *Going Glocal: Cultural Dimensions in Malaysia Management.* Kuala Lumpur: Malaysia Institute of Management.

Bearden, W. O. & Oliver R. L.. 1985. "The role of public and private complaining in satisfaction with problem resolution." *Journal of Consumer Affairs.* **19**(2): 222-240.

Bearden, W. O. 1983. "Profiling consumers who register complaints against auto repair services." *Journal of Consumer Affairs.* **17**(2): 315-335.

Bennett, R. 1997. "Anger, catharsis, and purchasing behaviour following aggressive customer complaints." *Journal of Consumer Marketing.* **14**(2): 156-172.

Blodgett, J. G., Wakefield K. L. & Barnes, J. H. 1995. "The effect of customer service on consumer complaining behaviour." *Journal of Services Marketing.* **9**(4): 31-42.

Broadbridge, A. & Marshall, J. 1995. "Consumer complaint behaviour: the case of electrical goods." *International Journal of Retail & Distribution Management.* **23**(9): 8-18.

Buttle, F. & Burton, J. 2002. **"**Does service failure influence customer loyalty?" *Journal of Consumer Behaviour.* **1**(3): 217-227

Colgate, M. & Hedge, R. 2001. "An investigation into the switching process in retail banking services." *International Journal of Bank Marketing.* **19**(5): 201-212.

Colgate, M. & Norris, M. 2001. "Developing a comprehensive picture of service failure." *International Journal of Service Industry Management.* **12**(3): 215-233.

Cornwell, T. B., Bligh, A. D. & Babakus, E. 1991. "Complaint behaviour of Mexican-American consumers to a third-party agency." *Journal of Consumer Affairs.* **25**(1): 1-18.

Crie, D. 2003. "Consumer's complaint behaviour. Taxonomy, typology and determinants: towards a unified ontology." *Journal of Database Marketing & Customer Strategy Management.* **11**(1): 60-66.

Day, R. L. & Landon, E. L. 1976. "Collecting Comprehensive Consumer Complaining Data by Survey Research." *Advances in Consumer Research.* **3**:263-268.

Day, R. L. 1977. "Extending the Concept of Consumer Satisfaction." *Advances in Consumer Research.* **4**(1): 149-154.

Desatnick, R. L. 1988. *Managing to Keep the Customer.* Boston, MA: Houghton Mifflin.

East, R. 1997. *Consumer Behaviour: Advances and Applications in Marketing.* Great Britain: Prentice Hall Europe.

Eccles, G. & Durand, P. 1998. "Complaining customers, service recovery and continuous improvement." *Managing Service Quality.* **8**(1): 68-71.

Fisher, J. E., Garrett, D. E., Arnold, M. J. & Ferris M. E. 1999. "Dissatisfied consumers who complain to the Better Business Bureau." *Journal of Consumer Marketing.* **16**(6): 576-589.

Fundin, A. P. & Bergman, B. L. S. 2003. "Exploring the customer feedback process." *Measuring Business Excellence.* **7**(2): 55-65.

Garland, R. 2002. "Estimating customer defection in personal retail banking." *International Journal of Bank Marketing.* **20**(7): 317-324.

Heung, V. C. S. & Lam, T. 2003. "Customer complaint behaviour towards hotel restaurant services." *International Journal of Contemporary Hospitality Management.* **15**(5): 283-289.

Hsieh, Y. J. 1996. "After sale services and consumer complaints: An empirical study." *Consumer Interests Annual.* **42**: 231-232.

Keng, K. A., Richmond, D., & Han, S. 1995. "Determinants of consumer complaint behaviour: A study of Singapore consumers." *Journal of International Consumer Marketing.* **8**(2): 59-76.

Kim, C., Kim, S., Im, S., & Shin, C. 2003. "The effect of attitude and perception on consumer complaint intentions." *Journal of Consumer Marketing.* **20**(4): 352-371.

Kolodinsky, J. 1995. "Usefulness of economics in explaining consumer complaints." *Journal of Consumer Affairs.* **29**(1): 29-54.

Lee, M. & Cunningham, L. F. 2001. "A cost/benefit approach to understanding service loyalty." *Journal of Services Marketing.* **15**(2): 113-130.

Liu, R. R. & McClure, P. 2001. "Recognizing cross-cultural differences in consumer complaint behaviour and intentions: an empirical examination." *Journal of Consumer Marketing.* **18**(1): 54-75.

Mason, J. B. & Himes, S. H. 1973. "An exploratory behavioural and socio-economic profile of consumer action about dissatisfaction with selected house appliances." *Journal of Consumer Affairs.* **7**: 121-127.

Michel, S. 2001. "Analysing service failures and recoveries: a process approach." *International Journal of Service Industry Management.* **12**(1): 20-33.

Ndubisi, N. O. 2003a. "Service quality: Understanding customer perception and reaction, and impact on business." *International Journal of Business. 5(2): 207-219.*

Ndubisi, N. O. 2003b. "Service marketing: Are perceptions of service quality predictors of behavioural intentions?" *Academy of Marketing Studies. 8(1): 37-45.*

Nyer, P. U. 2000. "An investigation into whether complaining can cause increased consumer satisfaction." *Journal of Consumer Marketing.* **17**(1): 9-19.

Peyrot, M. & V. D. Doris. 1994. "Effect of a class action suit on consumer repurchase intentions." *Journal of Consumer Affairs.* **28**(2): 361-379.

Reichheld, F. F. & Sasser, W. E., Jr. 1990. "Zero defections:quality comes to services." *Harvard Business Review,* 105-111.

Roland, R. T., & Zahorik, A. J. 1993. "Customer satisfaction, customer retention, and market share." *Journal of Retailing. 69(2): 193-215.*

Rowland, D., Arkkelin, D. & Crisler, L.. 1991. *Computer-based Data Analysis: Using SPSS* in the Social and Behavioural Sciences.* Chicago: Nelson-Hall Publishers.

Sheth, J. N., Mittal, B. & Bruce I. N. 1999. *Customer Behaviour: Consumer Behaviour & Beyond.* U. S. A.: The Dryden Press.

Singh, J. & Pandya, S. 1991. "Exploring the effects of consumers' dissatisfaction level on complaint behaviours." *European Journal of Marketing.* **25**(9): 7-21.

Singh, J. & Widing II, R. E. 1991. "What occurs once consumers complain? A theoretical model for understanding satisfaction/dissatisfaction outcomes of complaint responses." *European Journal of Marketing.* **25**(5): 30 – 46.

Singh, J. 1990a. "A typology of consumer dissatisfaction response styles." *Journal of Retailing.* **66**(1): 57-99.

Singh, J. 1990b. "Identifying consumer dissatisfaction response styles: an agenda for future research." *European Journal of Marketing.* **24**(6): 55 – 72.

Stewart, K. 1998a. "An exploration of customer exit in retail banking." *International Journal of Bank Marketing.* **16**(1): 6-14.

Stewart, K. 1998b. "The customer exit process - a review and research agenda". *Journal of Marketing Management.* 14: 235-250.

Volkov, M., Harker, D. & Harker, M. 2002. "Complaint behaviour: a stuffy of the differences between complainants about advertising in Australia and the population at large." *Journal of Consumer Marketing.* **19**(4): 319-332.

Warland, R. H., Herrmann, R. O. & Willits, J. 1975. "Dissatisfied consumers: who gets upset and who takes action." *Journal of Consumer Affairs.* **6**: 148-163.

Watkins, H. S. & Liu, R. 1996. "Collectivism, individualism and in-group membership: Implications for consumer complaining behaviors in multicultural contexts." *Journal of International Consumer Marketing.* **8** (3,4): 69-96.

Factors Influencing Sourcing Decisions: A Comparative View of International Buyer

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ASTRACT

Malaysia being an export intensive country needs to understand the expectation of the importing countries towards Malaysian suppliers. This paper investigates factors that developed countries look for when they decide to import from developing nations' suppliers. The article further compares the attributes of Malaysian and Taiwanese suppliers as perceived by importers of fasteners from 13 European nations. From the discussion and empirical evidence, it was found that Malaysian suppliers are on the right track even though there's still room for improvement.

INTRODUCTION

This study focuses on the dynamics of import process of developed countries, with emphasis on the investigation of factors that developed countries look for when they decide to import from newly industrialising nations. The study looks at the importing countries' purchasing policy behaviour towards suppliers in general and more specifically examines the attributes of exporters (represented by Malaysian, and Taiwanese suppliers) as perceived by importers of fasteners from 13 European nations.

LITERATURE REVIEW

Researchers in the purchasing literature found price, quality, and delivery as the main reasons for global or international sourcing of MNCs (Monczka & Giunipero, 1984; Min & Galle, 1991; Birou & Fawcett, 1993; Scully & Fawcett, 1994; and Alguire, Frear, & Metcalf, 1994). Investigation into the factors influencing the import decision of developed country importers by Tookey (1970) found that value for money, price, mark-up level, design, style, and range of colours influenced the decision making of the firm to import. Tookey noted that the UK importers were influenced by value for money more than price. He also noted that the competitive effect of low prices for imported knitwear was reduced by the low quality of the products. Tookey focused on British importers of knitwear products who bought from domestic suppliers in UK as well as from exporters based in developing countries. In a similar study conducted in US, Ghymn (1980) found that quality, style, brand name and other non-price features were the major variables affecting decision to buy from West European suppliers; while price, long-term supply stability and ordering/shipping procedures were significant factors influencing US importers' decision to purchase from developing nations. Ghymn's findings also suggested that other factors such as the specific characteristics of the product, the importing organization, and supplier nation were significantly associated with the purchasing decisions of the US importers. Leonidas (1988) noted that developing countries have been shortsighted in marketing their products to developed countries mainly because they cannot conceptualize the requirements and needs of their import partners.In another study by Katsikeas, and Ali Al-Khalifa (1992), the authors examined the import motivation of Bahraini buyers to purchase from UK suppliers. The study concluded that there was a multi-dimensional perceptual gap between the UK suppliers and the Bahraini importers. Noticeably, the perceptual gap was identified when the authors found that the UK exporters underestimated the magnitude of several import

motivation variables which include new product development, product quality, extended credit facilities, exclusive distributorship/agency, and after-sales service support. The authors suggested that in order to narrow this gap, it was vital to establish and maintain a strong working partnership between the UK exporters and the Bahraini distributors.

Swamidass and Kotabe (1993) in their exploratory study found that locational factors influenced global sourcing from the aspect of domestic versus foreign suppliers, that is, home, host, developed countries, and less developed countries. These locational factors were tariff and non-tariff barriers, nationality, stages in product life cycle, exchange rate stability, transportation cost, cost of manufacturing, growth in U.S. sales, and short-term profitability in the U.S.. Besides Swamidass and Kotabe (1993), Fraering and Prasad (1999) offers propositions on the influence of country factors on global sourcing in their conceptual paper. These country factors are exchange rate volatility, tariffs, and infrastructure. Kohn (1993) had listed the factors that affect global sourcing as location, products purchased, the competitive nature of the supply markets for those products, and the strategies employed to reduce total costs. Handfield (1994) found that majority of the critical suppliers to North American firms are foreign-based. These are firms manufacturing computers, electronics, automotive, pharmaceuticals, and chemical. Rajagopal and Bernard (1994) found similar findings in their study in United Kingdom (U.K.) of American companies based in U.K.. These companies sourced their goods from foreign companies if they are unable to source from their own companies. Oumlil, Sekely, and Yates (1994), further confirmed previous findings when they found 83 percent of U.S. firms surveyed in U.S. sourced products from foreign suppliers, and it increases as the size of the firm increases. They further found that 11.5 percent sourced from U.S. suppliers located outside U.S., and 8.3 percent from company's subsidiary outside U.S.. Insights as to why the preferences for foreign-based suppliers were not given. This study investigates factors that developed countries' buyers look for when they decide to import from developing nations' suppliers.

METHODOLOGY

This is an exploratory study conducted using a survey approach via e-mail. The questionnaires contained 15 items that measure attributes of suppliers based on European importer's perceptions on the importance of each variable. A total of 42 buyers, representing a 55% response rate completed and returned the questionnaires. The study looks at the importing countries' purchasing policy behaviour towards suppliers in general and more specifically examines the attributes of exporters represented by Malaysian and Taiwanese suppliers.

RESULTS

Tables 1 and 2 indicate the rankings according to attributes placed by the importers on Malaysian and Taiwanese suppliers.

Table 1: Attributes of Malaysian Suppliers

Supplier Attributes	Malaysia		
	Mean Value	S.D.	Ranking
Reliability/security of long term supply	4.20	0.81	1
Close relationship with foreign buyer	4.08	0.66	2
Ability to meet packaging requirements	3.98	0.90	3
High product quality meeting requirements requested	3.78	0.91	4
Ability to offer wide/full range of product	3.67	0.87	5
Excessive capacity to meet emergency order requirement	3.64	0.88	6
Satisfactory ordering and shipping procedures	3.57	0.80	7
Ability to meet flexible delivery requirement	3.33	0.87	8
Low transportation costs	3.05	1.05	9
High level of profit margin mark-up	3.02	0.96	10
Favourable payment terms	2.98	1.14	11
Brand name recognition	2.83	1.02	12
Ability to accept low minimum orders size	2.71	1.07	13

Table 2 : Attributes of Taiwanese Suppliers

Supplier Attributes	Taiwanese		
	Mean Value	S.D.	Ranking
Close relationship with foreign buyer	4.05	0.64	1
Reliability/security of long term supply	4.02	0.76	2
Ability to meet packaging requirements	4.02	0.64	2
High product quality meeting requirements requested	3.90	0.78	3
Satisfactory ordering and shipping procedures	3.57	0.77	4
Excessive capacity to meet emergency order requirement	3.45	0.74	5
Ability to meet flexible delivery requirement	3.43	0.74	6
Ability to offer wide/full range of product	3.40	0.80	7
High level of profit margin mark-up	3.32	0.85	8
Favourable payment terms	3.24	0.93	9
Low transportation costs	3.10	0.97	10
Ability to accept low minimum orders size	2.98	1.00	11
Brand name recognition	2.88	0.95	12

From Table 1 and 2 European importers ranked *Reliability of long term supply*, and *Close relationship with foreign buyer* inversely for Malaysian and Taiwanese suppliers. Malaysian suppliers were ranked first for reliability while Taiwanese suppliers were ranked first for relationship. European importers viewed reliability as their top priority when they looked for Malaysian supplier's because of the good track record in the past when Malaysia started to focus on the European market and proved its ability at ensuring consistent supply and commitment to the customers. In comparison to Taiwanese supplier, relationship is viewed as the European importers top priority since the buyers have been sourcing from reputable Taiwanese suppliers.

Malaysia's *Ability to meet packaging requirements* was ranked 3 because of complex higher set up investment and operations cost. The product exhibit high varieties but low volume characteristics, thus making it less economically viable for automation of packaging operations. The Taiwanese suppliers were ranked 2 on this attribute indicating that importers value highly the ability of suppliers to meet packaging requirements.

The Malaysian supplier was ranked lowest on *Ability to accept low minimum order size* on account of its policy to request for a certain minimum order quantity to ease production and reduce set up time. It is also noted that the Taiwanese supplier attributes rankings are quite similar to the Malaysian supplier. *Brand name recognition* was ranked last for the Taiwanese supplier that are very productive and skillful, but however, are weak in marketing strategy. Typically, many of the owners are from the technical rank and file, hence marketing a brand is not given its due recognition as compared to the production side.

Table 3 shows the comparative rankings according to attributes by importers on Malaysian, and Taiwanese exporters. Generally, the Taiwanese exporters are ranked more favourably relative to Malaysian exporters, scoring the highest in 9 out of 13 attributes. The table gives vital information as regards to European import motivations that should be taken into consideration by exporters from developing countries.

Malaysia exhibited the highest mean score of 4.20 for *Reliability/security of long term supply*. The attributes *Reliability/security of long term supply*, *Close relationship with foreign buyer*, and *Ability to meet packaging requirements* seem to be the three most important source of motivations to import among European buyers as indicated by scores of mostly 4.0 and above. Out of these three attributes, Malaysia was ranked first in the first two attributes, mainly *Reliability/security of long term supply*, and *Close relationship with foreign buyer*.

CONCLUSION

Overall, the results indicate that developing country suppliers need to understand the complex needs of their foreign counterparts when formulating international marketing strategies. Although some of these needs seem to be fulfilled as indicated by scores of 4.0 and above, there are also many unfulfilled needs as indicated by scores of 3.0 and below, suggesting the presence of perceptual gaps between suppliers and buyers. Hence bridging these gaps is vital

if sellers from the developing world want to forge long lasting relations with their foreign buyers from developed countries.

Table 3: Comparative Ranking According to Attributes of Malaysian and Taiwanese Suppliers

Supplier Attributes	Malaysia		Taiwanese	
	Mean Value	Ranking	Mean Value	Ranking
Reliability/security of long term supply	4.20	1	4.02	2
Close relationship with foreign buyer	4.08	1	4.05	2
Ability to meet packaging requirements	3.98	2	4.02	1
High product quality meeting requirements requested	3.78	2	3.90	1
Ability to offer wide/full range of product	3.67	1	3.40	2
Excess capacity to meet emergency order requirement	3.64	1	3.45	2
Satisfactory ordering and shipping procedures	3.57	1	3.57	1
Ability to meet flexible delivery requirement	3.33	2	3.43	1
Low transportation costs	3.05	2	3.10	1
High level of profit margin mark-up	3.02	2	3.32	1
Favourable payment terms	2.98	2	3.24	1
Brand name recognition	2.83	2	2.88	1
Ability to accept low minimum orders size	2.71	2	2.98	1

LIMITATIONS

The study has several limitations. First, the study only involved importers of fasteners. Therefore, the results of the study may not be generalizable to other industries. Secondly, the responding companies are from the European countries, which again cannot be generalized to companies from other parts of the world. Future studies should refine these generalizations through a qualitative research.

REFERENCES

Alguire,M.S., Frear,C.R., & Metcalf,L.E. (1994). An examination of the determinants of global sourcing strategy. *Journal of Business & Industrial Marketing*. 9(2), 62-74.

Birou,L.M. & Fawcett,S.E. (1993). International purchasing: Benefits, requirements, and challenges. *International Journal of Purchasing and Materials Management*, 29. Spring. 28-37.

Fraering,M., & Prasad.S. (1999). International sourcing and logistics: An integrated model. *Logistics Information Management*, 12(6), 451-460.

Handfield, R.B. (1994). US global sourcing: patterns of development. *International Journal of Operations & Production Management*, 14(6), 40-51.

Min.M., & Galle,W.P. (1991). International purchasing strategies of multinational U.S. firms. *International Journal of Purchasing and Materials Management*, 27 (2), 143-56.

Monczka,R.M. & Giunipero,L.C. (1984) International purchasing: Characteristics and implementation. *Journal of Purchasing and Materials Management*, 20(3), 2-9.

Oumlil,A.B., Sekely,W. & Yates,R. (1994). Global sourcing, alliances, and purchasing for U.S. firms: an empirical study. In *Capitalising The Potentials of Globalisation-Strategies* & Dynamics of Business, (Kaynak,E. & Sulaiman, M., ed), 583-587. Third World Business Congress Proceedings, 16-18 June, Penang, Malaysia.

Rajagopal,S. & Bernard,K.N. (1994). Motivational factors for global procurement strategies. *In Capitalising The Potentials of Globalisation-Strategies & Dynamics of Business*, (Kaynak,E. & Sulaiman, M., ed.), 265-273. Third World Business Congress Proceedings, 16-18June, Penang, Malaysia.

Swamidass,P.M., & Kotabe, M. (1993). Component sourcing strategies of multinationals: An empirical study of European and Japanese multinationals. *Journal of International Business Studies*. First Quarter, 81-99.

The Transfer of Marketing Knowledge in Domestic and Export Oriented Joint Venture Firms in Southern Thailand: Finding from a Pilot Study

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ABSTRACT

International joint venture (IJV) provides a platform for organizational learning. Partner firms have the opportunity to internalize new skills and capabilities that not previously available within the organization. The pilot study conducted in Southern Thailand shows that the transfer of marketing knowledge has taken place. The level of transfer is higher in export oriented IJVs compared to domestic oriented IJVs.

INTRODUCTION

When economic planners decided to shift the focus of economic development from commodity based to manufacturing and value-added based, the role of marketing becomes crucial. In a developing country, marketing knowledge is one aspect of management that is usually neglected and it is little understood by a large number of business proprietors and managers. It is widely acknowledged in the literature that foreign companies adopted advanced management techniques and posses superior knowledge. Therefore, many of policy makers in developing nations are attract FDI's in expediting economic development through transfers of advance skill or expertise from its foreign partner. The conductive business environment created through various policies to encourage FDI has witnessed the influx of foreign companies in Thailand. More than 2,529 foreign companies have established their operations between 1997 to 2000 (BOI, 2001). The establishment of international joint ventures between the locals and foreign firms are encouraged. Through various incentives provided, the Thai authority is hopeful that the competitiveness of local companies would be enhanced through the transfer of technology, management expertise and marketing knowledge. This paper presents the finding of a pilot study on the transfer of marketing knowledge.

LITERATURE REVIEW

There has been a proliferation research on the transfer of management knowledge in western organizations, which have entered into joint venture or strategic alliances with firms in transition economies (Aydin & Terpstra, 1981; Fan, 1998; Fahy, 2000; Griffith, Zeybek & O'Brien, 2001). The foreign partner had brought the advanced knowledge such as modern business and the marketing management to the local partner. Less attention is being paid to nations that adopt a guided yet open economic system which are strategically repositioning its economic base such as Thailand. One of the areas of the studies that have received attention in Thailand is the impact of FDI, with specific reference to the transfer of technology. Thailand is treated basically as a production base, which provided the abundance and low cost of materials (Adisak, 2000). Foreign companies have invested in human resource training and raised the capability of Thai workers. Even though foreign companies supported the local suppliers through training programs but the level of technology transferred is rather limited (Wisarn & Bunluasak, 1994). While A neglected area of study is the transfer of soft technology such as management knowledge, in particular the marketing knowledge. A limited number of studies

have been attempted to assess the marketing practices between local and foreign firms. As expected, foreign firms are far superior in managing marketing activities (Fongsuwan, 1999) and in particular new product development activities (Prisana and Speece, 2000). This study departs from the popular area of investigation, that is the transfer of technology or technical capability to a softer yet unexplored area that is the transfer of marketing knowledge. The focus is on international joint venture firms in Southern Thailand.

Research Objectives

The purpose of this paper is to report the findings from a pilot study that investigates the marketing knowledge acquired by local partner in international joint venture firms in Southern Thailand. This pilot study addresses the following research questions:
- What are the characteristics of international joint ventures in Southern Thailand?
- To what extent and what specific aspect of marketing knowledge has been transferred?
- Do the transfer of marketing knowledge differ between export oriented and domestic oriented IJV firms?

RESEARCH METHODOLOGY

The personal interview method using a structured survey instrument was carried out in December 2001. The Thai managers are identified from the Thailand Board of Investment (BOI) Directory. The companies selected are those located in Southern Thailand. The survey instruments were developed based on literature review in the area of marketing and international joint ventures (Akaah & Riordan, 1988; Lyles & Salk, 1996; Cavusgil, Yavas & Dhahran. 1984; Si & Bruton, 1999) and have been deliberated in the bi-annual Research Colloquium, School of Management, Universiti Sains Malaysia. The responses to thirty seven items describing various aspects of marketing activities were solicited on 5-point Likert-type scale ranging from 1 = none at all to 5 = extensive). In addition, information on the two types namely domestic oriented and export oriented IJVs are also solicited.

FINDINGS

This section reports the findings. Information of the characteristics of IJV is discussed. In addition to descriptive statistics, a t–test was performed to determined if there is a difference in the extent of transfer between IJV firms that are domestic oriented compared those export oriented. The profiles of 30 responding firms are presented in Table 1.

Table 1: General Characteristics of the Sample Organization (n=30)

Demographic Variables	Categories	Frequency	Percentage (%)
Length of operation	Less than 5 years	18	60.0
	More than 5 years	12	40.0
Assets	Less than 99.99 million bath	25	83.3
	100 million bath and above	5	16.7
Number of employees	Less than 100 employees	24	80.0
	More than 100 employees	6	20.0
Country of origin	Japan & NIEs	16	53.3
	Western	3	10.0
	Asia	6	20.0
	Others	5	16.7
Foreign equity	Less than 49.99%	17	56.7
	More than 50%	13	43.3
Industry categories	Agriculture and agricultural product	11	36.7
	Service and infrastructure	13	43.3
		6	19.9
Industry sector	Consumer goods producers	22	73.3
	Industrial goods producers	8	26.7

Of the total, 18 firms were relatively new (less than 5 years in operation) meaning these firms have begun their operations between 1996 to 2000. In terms of size as measuring by the number of employees, 24 firms may be classified as small-sized firms as their assets are less than 100 million baht, and employ not more than 100 employees. Majority is producing consumer products and operates in a buyer's market environment. In terms of industry categories, (43%) of the firms engaged in service and infrastructure, (37%) in agriculture and agricultural product. Approximately 54% of the origin of the foreign partner is from Japan and NIEs country.

Transfer of Marketing Knowledge

Marketing knowledge is classified into 6 major areas, namely strategic marketing management activities, management of product-mix activities, management of price-mix activities, management of distribution-mix activities, management of promotion-mix activities and international marketing management skills. The pattern of mean values and the results of t-test are presented in Tables 2 to 6.

Strategic Marketing Management Activities

Table 2 displays the pattern of mean values on strategic marketing management activities. Overall, the transfer of knowledge on the commitment to continuous improvement and innovation registered the highest mean value (3.63). This is followed by knowledge on formulation a marketing plan. The extent of transfer of all the eight elements of strategic marketing knowledge is higher in joint venture firms that are export oriented than domestic. The differences in the level of transfer are statistically significant except managing for profitability not sales volume.

Table 2 : *Strategic Marketing Management Activities*

Strategic Marketing Activities:	Overall Mean (SD)	Market Focus		t-value
		Domestic orientation	Export orientation	
Managing for profitability not sales volume	3.50 (1.01)	3.28	3.83	-1.51
Targeting customer precisely	3.47 (0.97)	3.11	4.00	-2.70*
Measuring and managing customer expectation	3.40 (0.93)	3.06	3.92	-2.74**
Commitment to continuous improvement and innovation	3.70 (1.12)	3.33	4.25	-2.37*
Building customer focus	3.40 (0.89)	3.06	3.92	-2.89**
Formulating marketing	3.40 (1.04)	2.94	4.08	-3.45**
Control and evaluation of marketing activities	3.17 (0.91)	2.89	3.58	-2.16*
Positioning of company product	3.63 (1.07)	3.33	4.08	-2.20*

**p< 0.01; *p< 0.05

The Management of Product-mix Activities

Table 3 presents the pattern of mean values on the extent of transfer of product-mix activities. The overall mean score ranges from 2.83 to 3.33. The development of new products or service (3.33) received the highest of transfer of product-mix activities followed by the modification of existing products or service (3.17). The extent of transfer of all the six elements regarding to management product mix activities is higher in exported oriented JVs compare to domestic oriented JVs. This is supported by the statistically significant differences in the level of transfer of these two elements.

Table 3: Management of Product-mix Activities

Product-mix Activities	Overall Mean (SD)	Market Focus		t-value
		Domestic orientation	Export orientation	
The development of new products or services.	3.33 (1.06)	3.06	3.75	-1.82[+]
The modification of existing products or services.	3.17 (1.02)	3.00	3.42	-1.10
The elimination of products or services that do not satisfy customer's desires.	3.10 (1.32)	2.72	3.67	-2.01+
The formulation of brand names and branding policies.	2.97 (1.33)	2.83	3.17	-0.66
The preparation of product or service warranties and the establishment of procedures for fulfilling warranties.	2.83 (1.34)	2.72	3.00	-0.54
The planning of product or service packages (e.g. sizes, shapes, colors, designs).	3.00 (1.44)	2.67	3.50	-1.59

[+]p< 0.10

Management of Pricing-mix Activities

Table 4 displays the pattern of mean values on the extent of transfer knowledge on management pricing-mix activities. The overall mean score ranges from 3.60 to 3.13 with the transfer of knowledge on actual setting of prices recording the highest mean value. The least transferred is the establishment of conditions and terms of sales (mean value = 3.13). Further analysis of the pattern of mean values show that the transfer of management of price-mix activities is greater in export oriented compare to domestic oriented, except the establishment of conditions and terms of sales. The results of t-test show that one price activity is statistically significant, that is the extent of the transfer of knowledge on the determination of discounts for various categories of buyers.

Table 4: Management of Pricing-mix Activities

Pricing-mix	Overall Mean (SD)	Market Focus		t-value
		Domestic orientation	Export orientation	
The analysis of competitors' prices.	3.20 (1.270)	3.06	3.42	-0.75
The formulation of policies and methods for setting prices.	3.57 (1.040)	3.33	3.92	-1.54
The actual setting of prices.	3.60 (1.102)	3.33	4.00	-1.67
The determination of discounts for various categories of buyers.	3.27 (1.202)	2.94	3.75	-1.87+
The establishment of conditions and terms of sales.	3.13 (1.042)	3.17	3.08	0.21

+p< 0.10

The Management of Distribution-mix Activities

Table 5 presents the pattern of mean values on the transfer of knowledge on management of distribution-mix activities. The overall mean score ranges from 2.53 (the establishment of distribution centers) to 3.17 (the implementation of inventory control). On the whole more knowledge is transferred in export oriented joint venture firms compared to domestic oriented joint venture firms except with the transfer of knowledge on the electronic marketing is higher in the domestic oriented joint venture firms. Nevertheless the differences in the extent of transfer of knowledge is statistically significant higher in joint venture firms that export oriented with respect to the transfer of the evaluation of various types of distribution channels, the design of distribution channels, the formulation and implementation of procedures for efficient product or service handing, and the implementation of inventory controls.

Table 5:Management of Distribution-mix Activities

Distribution-mix	Overall Mean (SD)	Market Focus		t-value
		Domestic oriented	Export oriented	
The evaluation of various types of distribution channels.	3.00 (1.155)	2.61	3.58	-2.67*
The design of distribution channels	2.83 (1.18)	2.50	3.33	-1.99+
The design and implementation of an effective program for dealer relations.	2.87 (1.20)	2.72	3.08	-0.80
The establishment of distribution centres or outlets.	2.53 (1.17)	2.50	2.58	-0.18
The formulation and implementation of procedures for efficient product or service handling.	3.03 (1.27)	2.78	3.42	-1.36*
The implementation of inventory controls.	3.17 (1.32)	2.78	3.75	-2.09*
The analysis of transportation methods.	3.03 (1.07)	2.78	3.42	-1.65
The minimization of total distribution cost.	3.07 1.17)	2.78	3.50	-1.70
The analysis of possible locations for wholesale and retail outlets.	2.83 (1.23)	2.67	3.08	-0.90
Electronic Marketing (e.g. E-commerce transaction, web site promotion)	2.77 (1.25)	2.78	2.75	-0.05

*p< 0.05; +p< 0.10

Management of Promotion-mix Activities

Table 6 presents the pattern of mean values of transfer of knowledge on management of promotion-mix activities. The mean score ranges 2.13 (the planning and implementation of sales promotion) to 2.80 (the setting of promotional objectives). A comparison between the two groups of joint venture firms shows that all but one promotional activity registering a mean value of less than 3.00. This information indicates that the management of promotional activities is probably least attended to in joint venture firms. The results of t-test show that none of the promotion-mix activity is statistically significant. The extent of the transfer of knowledge on the promotion-mix activity is substantially higher in domestic oriented joint venture firms.

Table 6: Management of Promotion-mix Activities

Promotion –mix	Overall Mean (SD)	Market Focus		t-value
		Domestic orientation	Export orientation	
The setting of promotional (e.g. advertising) objectives.	2.80 (1.27)	2.89	2.67	0.46
The determination of the major types of promotion (e.g. advertising, sales promotion, personal selling) to be used.	2.67 (1.27)	2.67	2.67	0.00
The selection and scheduling of advertising media.	2.53 (1.31)	2.67	2.33	0.67
The development of advertising messages.	2.70 (1.29)	2.89	2.60	0.98
The evaluation of advertising effectiveness.	2.73 (1.29)	2.78	2.67	0.22
The recruitment and training of salespersons.	2.53 (1.11)	2.44	2.67	-0.53
The formulation of compensation program for sales personnel	2.60 (1.16)	2.56	2.67	-0.25
The planning and implementation of sales promotion (e.g. participation in international trade fairs).	2.13 (0.97)	2.28	1.92	0.99
The preparation and dissemination of publicity releases.	2.60 (1.35)	2.28	3.08	-1.53

*p< 0.05

International Marketing Management Knowledge

The responses to items tapping the transfer of knowledge in dealing with international markets are presented in Table 7. The results show that a relatively high level of transfer occurred in all the items with the mean values for those export oriented companies ranging from 3.50 to 4.42. The results of t-test show that the difference in the mean values of all four international marketing skills is statistically significant. It is evidence that the transfer of knowledge is substantially higher in export oriented joint venture firms than the domestic oriented joint venture firms. Thus suggesting that international marketing skills will only be transferred if the firms are export oriented.

Table 7: International Marketing Skills

International Marketing Skills	Overall Mean (SD)	Market Focus		t-value
		Domestic oriented	Export oriented	
Knowledge about foreign business cultures	3.40 (1.30)	2.78	4.33	-3.91**
Knowledge about negotiation styles	3.57 (1.25)	3.00	4.42	-4.20***
Foreign communication skills (e.g. written, oral)	3.77 (1.10)	3.44	4.42	-2.06*
Import and export procedures	3.00 (1.15)	2.67	3.50	-2.06*

**$p < 0.01$; * $p < 0.05$

DISCUSSION AND CONCLUDING REMARKS

The importance of industrialization as the principal path to economic growth in developing countries is widely recognized. Evidence however suggests that developing countries striving towards industrialization are often constrained in their efforts by lack of competent and knowledgeable workforce. The common means of bringing the needed knowledge to developing countries from developed countries include foreign direct investment, the formation of joint ventures and strategic alliances. Such arrangements will pave the way for the indigenous firms to acquire new skills and knowledge from their foreign counterparts.

Findings of this pilot study show that some form of knowledge transfer has taken place in joint venture firms operating in Thailand. As anticipated, the transfer of knowledge is substantially higher in joint venture firms that exported oriented. The speed of change within the global environment brought along the managerial know-how and benefited the Thai managers. The ranking of the mean values show that the top five knowledge that the Thai managers acquired are positioning of the company's product, formulating policies and methods of setting prices, actual setting of prices, the development of new products or services, and knowledge about negotiation styles. It can infer that the Thai managers in these organizations have acquired knowledge in the areas of strategic marketing.

Even though the transfer of knowledge is lower in domestic oriented joint ventures, it is worth noting that they too have acquired some marketing knowledge from their foreign partner. Analysis of the pattern of mean values for this group shows that they have acquired knowledge particularly those related to operating in international business environment. The ranking of the mean values show that the top five knowledge that Thai managers in these firms have acquired are foreign communication skills, foreign business cultures, negotiation styles, commitment to continuous improvement and innovation, positioning of company product, formulation of policies and methods for setting of price, and the actual setting of prices. The findings indicate that the Thai managers acquired knowledge, which are vital for international expansion and strategic marketing management. The least transferred knowledge is related to the management of promotion-mix activities. Thus reflecting the generally held view that FDI in Thailand are motivated by availability of cheap resources. The foreign partner undertakes the crucial promotional activities and is probably managed at the home office.

REFERNCES

Adisak, C. (2000). The determinants of U.S. direct investment in Thailand: A survey on managerial perspectives, *Multinational Business Review*, 8(2), 82-88

Akaah, I. P., & Riordan E. A. (1988). Applicability of marketing know-how in the Third World. *International Marketing Review*, 5 (1), 41-55

Aydin, N., & Terpstra, V. (1981). Marketing know-how transfer by multinational: A case study in Turkey, *Journal of International Business Studies*, 12(3), 35-48

Cavusgill, S. T., Yavas, U., & Dhahran. (1984). Transfer of management know-how to developing countries: An empirical investigation, *Journal of Business Research*, 12(1), 35-50

Fahy, J. (2000). The development and impact of marketing capabilities in Central Europe. *Journal of International Business Studies*, 31(1), 63-82

Fan, Y. (1998). The transfer of western management to China. *Management Learning*, 29(2), 201-22

Fongsuwan, W. (1999). A comparative study of international marketing strategies between Japanese, American and European multinational companies: Thailand 1997, Centre for ASEAN Studies, CAS Discussion Paper No. 25.

Griffith, D. A., Zeybek, A. Y., & O'Brien, M. (2001). Knowledge transfer as a means for relationship development: A Kazakhstan-Foreign international joint venture illustration, *Journal of International Marketing,* 9(2), 1-18

Lyles, M. A., & Salk, J. (1996). Knowledge acquisition from foreign parents in international joint ventures: An empirical examination in the Hungarian context, *Journal of International Business Studies,* 27(5), 877-903

Lyles, M. A. (1988). Learning among joint venture sophisticated Firms, *Management International Review*, 28(4), 85-97

Prisana, S., & Speece, M. (2000). Continuous learning process in new product development in the Thai food-processing industry. *British Food Journal,* 102 (8), 598-614

Si, X. S., & Bruton, G. D. (1999). Knowledge transfer in international joint ventures in transitional economies: The China experience. *Academy of Management Executive*, 1(13), 83-90

Wisarna, P., & Bunluasak, P. (1994). The new wave of foreign direct investment in Asia: Foreign direct investment and industrial restructuring in Thailand, *Nomura Research Institute and Institute of Southeast Asia Studies*, 160-173.

Economic Development and Population Growth:
Econometric Tests of the ASEAN Countries

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ABSTRACT

An intricate relationship between population growth and economic development has been a focus of discussion in economic development literature. This paper chooses five Southeast Asian countries (i.e., Malaysia, Indonesia, Singapore, Thailand and the Philippines) as case studies to examine the existence of a long-run relationship and causality between economic development and population growth. The results of Johansen cointegration method indicate that there is no long-run relationship between population and the real per capita GDP. On the other hand, the results of Granger causality test establish the existences of Granger causality between these two variables in some countries. In short, there is still a lack of empirical evidence to conclude that population growth causes the real per capita GDP growth, or is caused by it. The findings of the present paper generally confirm the findings of previous researches on this topic.

INTRODUCTION

Rapid population growth in the developing countries has been attracting global attention. An ever-increasing imbalance between population growth and economic growth in the less developed countries has been calling to mind the Malthusian hypothesis that expanding population will jeopardise the humankind's future and make people's livelihood more precarious. However, Malthus and his successors, Neo-Malthusians, apparently overlook the fact that technological progress that has been in evidence since the industrial revolution has been able to upgrade living standards in many parts of the world and keep starvation at bay.

There is little doubt that population growth in the developing countries has far reaching implications on those countries' economies, societies and even cultural sphere. The expansion of population plays critical role in the political economy of the developing countries. In other words, population trends in developing countries are having significant impact on their economic performance. As Dawson and Tiffin (1998, p.149) put it, "The relationship between population growth and economic development has long been thought to be fundamental to our understanding of less developed countries (LDCs)." The important question is whether the population growth's impact on the economic development could be described as positive or negative?

In those developing countries where correlation between population growth and economic performance could be regarded as *positive*, demographic trends stimulate economic development and lead to a rise in living standards. This is because population growth encourages competition in business activities. As the population grows, so does the size of potential markets. Expansion of the market, in its turn, encourages entrepreneurs to set up new businesses.

By contrast, if correlation between population growth and economic performance of a country could be described as *negative*, the increase of population is likely to become an impediment to the country's economic development. This is because rapid expansion of population increases dependency burden (i.e., the number of people who are considered to be economically unproductive, such as children and elder people).

This paper examines co-integrating relationship, or correlation, between population and economic growth in ASEAN countries. An econometric method is used to test whether there is a long-run equilibrium relation between the two variables. Unit root tests and co-integration test are used in this study to examine the long-run relationship between population trends and economic performance of ASEAN countries.

This paper consists of five sections. Following Introduction, Section 2 gives a brief review of the debate on the relationship between population growth and economic development. Section 3 discusses research methods used to analyse short-run and long-run relationships between population growth and economic performance. Section 4 reports findings of the empirical research carried out in this paper. Section 5 concludes.

POPULATION DEBATE

For more than two centuries, a complex relationship between economic development and population growth has been a focus of debates and much-discussed issue, especially among the development economists. Many prominent researchers, including Nobel Prize laureates, have contributed to the discourse on the ever-increasing world population. The main question has been whether population growth has positive or negative impact on the economic development.

Within the mainstream of the economic thought, a founding father of modern economics, Thomas Malthus, set the debate by publishing his influential if not controversial book "*An Essay on Population*" (Malthus, 1798). Since then, Malthus has been dubbed as the "prophet of doom". He described the relationship between population growth and economic development as "dismal". According to Malthus, economic growth is conducive to population growth. The rapid expansion of population, in its turn, undermines economic development. This is because population growth tends to occur at a much faster rate than production growth. Malthus believed that if no preventive measures were taken to regulate the expansion of population, doomsday would follow when millions of people would starve and perish.

Despite some obvious shortcomings in his reasoning, Malthus' ideas and his "dismal" view on the relationship between population growth and economic development influenced, directly or indirectly, a number of modern economists and opinion leaders. For instance, a group of European economists and intellectuals, the Club of Rome, published a book titled "*The Limit to Growth*", (Meadows *et al*, 1972). One of the book's hypotheses was that within one hundred years humankind would inevitably face some sort of economic and/or social catastrophe unless preventive measures are taken. Curbing world population growth is suggested as one of the preventive measures by the authors of the book.

Furthermore, some international organisations as well as governments of a number of the developed countries have expressed their concern about the rapid expansion of the world population. In 1973, the President of the World Bank warned that "population explosion" could be as serious threat to humanity as nuclear war. In 1980, President of the United States Jimmy Carter requested that the State Department and the Council on Environmental Quality conduct a research on global issues. The findings of the research were published under the title *Global 2000 Report*. The *Report* claimed that should the present-day demographic trends continue, the world in the future would become more crowded and less ecologically stable (Buchholz, 1999).

A number of prominent modern economists assert that, left unchecked, population growth will have a negative impact on economic development. For example, a Nobel Prize laureate, Paul Samuelson, in his article "The Optimum Growth Rate for Population" (1975) maintains that population growth can bring about resource exhaustion because of the law of diminishing of returns. As Samuelson concludes, "…Increases in population will cause the law of diminishing returns to be brought into play and to leave all subsequent generations in a worsened situation" (Samuelson, 1975, p.537).

In a similar vein, Lester Brown (1976) asserts that population growth was the root cause of a number of serious problems in the developing countries, such as inflation, unemployment, loss of individual freedom. He argues that many developing countries risk their future development by leaving population growth unchecked and urges these countries to take appropriate measure to control the expansion of population.

On the other hand, there are economists who disagree with the Malthusian notion of a dismal relationship between population growth and economic development. For instance, a prominent population economist, Julian Simon, highlights the positive side of population growth. According to him, human capital is the vital and most essential element for economic growth. As Simon points out,

> "The ultimate resource is people – skilled, spirited, and hopeful people who will exert their wills and imaginations for their own benefit, and inevitably they will benefit not only themselves but the rest of us as well" (Simon, 1996, p.589).

Bruce Herrick and Charles Kindleberger (1983) put forward four propositions in support of the idea that population growth may have positive influence on the economic development. Firstly, they assert, population growth would usher in economies of large-scale production. The expansion of local markets caused by population growth would lead to the expansion of production. This, in turn, would lower production cost. Secondly, population growth would accelerate the rate of investment in expanding markets. Increase in the investment is conducive to a rapid expansion of output; also, it lowers production cost. Thirdly, population pressure in the developing countries could stimulate the communities' resistance to a decline in living standards. In other words, the threat of poverty caused by a rapid population growth would motivate people to make greater efforts to better their life. Finally, population growth stimulates competition, which could lead to more innovations in technology and ensure a faster technological progress.

Michael Kremer (1993) also asserts a positive relationship between population growth and economic development. He argues that population growth has a "creative effect" on the economic development. According to Kremer, the process of creating new technologies is related to population size.

A number of empirical researches have been done on the relationship between population growth and economic growth. For example, Dawson and Tiffin focused on India. The researchers used the augmented Dickey-Fuller (ADF) unit roots test and the Johansen co-integration method to analyse co-integrating relations between India's per-capita income and its population growth. Dawson and Tiffin argue that there is no long-run equilibrium relationship between the two variables. As they put it, "We find that population is trend stationary, while per capita income has a unit root; hence a long-run relationship between the two variables cannot exist… Thus, population growth neither causes per capita income growth nor is caused by it" (Dawson and Tiffin, 1998, p.154).

John Thornton conducted research on the long-run relationship between the economic development and population growth in seven Latin American countries, i.e. Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. He concluded that population growth was trend stationary while per capita income had unit roots and there was no long-run relationship between the two variables. Thornton's findings concur with the results of Dawson and Tiffin's research. As Thornton maintains, "A long-run relation between population and real per capita GDP does not appear to exist; hence, population growth neither causes growth of per capita GDP nor is caused by it" (Thornton, 2001, p.466).

DATA AND METHODOLOGY

The data for population and the real GDP per capita are annually. The data were obtained from Penn World Table. The data for the Philippines and Thailand are 1950-2000; the data for Indonesia and Singapore are 1960-2000; and the data for Malaysia are 1955-2000. All the data were transformed in logarithms.

The empirical estimation in the study begins with the unit root tests. The Dickey and Fuller (1979) and Phillips and Perron (1988) unit root test statistics are used. The Johansen (1988) cointegration method is used to test the number of cointegrating vectors. The Johansen (1988) cointegration method can be used to compute two likelihood ratio tests for testing the number of cointegrating vectors in the system, namely the maximum eigenvalue (λ_{Max}) and trace (λ_{Trace}) statistics, which are respectively computed as:

$$\lambda_{Max} = -T \ln (1 - \lambda_{r+1}) \tag{1}$$

$$\lambda_{Trace} = -T \sum_{i=r+1}^{p} \ln (1 - \lambda_i) \tag{2}$$

where T is the sample size and λ_i are the eigenvalues. The λ_{Max} test statistic tests the null hypothesis (H_0) of r cointegrating against the alternative hypothesis (H_a) that there are $(r + 1)$ cointegrating vectors. The λ_{Trace} test statistic tests the H_0 that has at most r cointegrating vectors in the system. That is, the number of cointegrating vectors is less than or equal to r (Johansen, 1988). The likelihood ratio test statistics can be sensitive to the choice of the lag length in the estimation. Thus, the choice of the lag length in the estimation is determined by Schwarz Bayesian criterion (SBC).

In the Granger (1969) sense of a variable X causes another variable Y if the current value of Y can better be predicted by using past values of X. On the other hand, Y is said Granger causes X if the past values of Y can be used to improve the prediction of X. When series are not cointegrated, the simple Granger-causality test are used:

$$\Delta \ln Y_t = \beta_{10} + \sum_{i=1}^{p} \beta_{11i} \, \Delta \ln POP_{t-i} + \sum_{i=1}^{q} \beta_{12i} \, \Delta \ln Y_{t-i} + \nu_{1,t} \tag{3}$$

$$\Delta \ln POP_t = \beta_{20} + \sum_{i=1}^{r} \beta_{21i} \, \Delta \ln POP_{t-i} + \sum_{i=1}^{s} \beta_{22i} \, \Delta \ln Y_{t-i} + \nu_{2,t} \tag{4}$$

where Δ is the first difference operator; Y_t is the real GDP per capita; POP_t is population; and $\nu_{i,t}$ ($i = 1, 2$) is a disturbance term. For example, if the joint test, i.e. the F-statistic of lagged variables of $\Delta \ln POP_t$ in equation (3) is significantly different from zero, and then it implies that $\Delta \ln POP_t$ Granger causes $\Delta \ln Y_t$. If the joint test of lagged variables of $\Delta \ln Y_t$ is significantly different from zero in equation (4), then it implies that $\Delta \ln Y_t$ Granger causes $\Delta \ln POP_t$. The minimum final prediction error (FPE) criterion proposed by Akaike (1971) is used to determine the optimal lags of the model.

EMPIRICAL RESULTS

The results of the Dickey and Fuller (1979) and Phillips and Perron (1988) unit root test statistics are reported in Table 1. The lag length used to compute the Dickey and Fuller (1979) test statistics is based on Akaike (1973) Information criterion (AIC). For the Phillips and Perron (1988) unit root test statistics, the results that are reported are based on three truncation lags, which are used to compute the test statistics after considering truncation lags one to three in computing the test statistics. Generally, the results of the Dickey and Fuller (1979) and Phillips and Perron (1988) unit root test statistics show that the real GDP per capita is integrated of order one, except Thailand, which the unit root test statistics show that it is integrated of order zero. For population, generally, the results of the unit root test statistics show that it is integrated of order one, except Indonesia and Malaysia, the results of the Dickey and Fuller (1979) unit root test statistic show that it is integrated of order zero while the results of the Phillips and Perron (1988) unit root test statistic show that it is integrated of order one. Generally, population and the real GDP per capita are found to be integrated of order one.

The results of the Johansen (1988) cointegration method are reported in Table 2. The results of the λ_{Max} and λ_{Trace} test statistics are computed with unrestricted intercepts and no trends. For Malaysia, Singapore and Thailand, the results of the λ_{Max} and λ_{Trace} test statistics show that the null hypotheses, i.e. H_0: $r = 0$ and H_0: $r \leq 1$ are not rejected at 95 percent critical value, which indicate that population and the real GDP per capita are not cointegrated. For Indonesia, the results of the λ_{Max} and λ_{Trace} test statistics show that the null hypotheses are all rejected, which also imply that there is no cointegration between population and the real GDP per capita. Lastly, for the Philippines, the λ_{Max} test statistic shows that the null hypotheses are not rejected at 95 percent critical value. In contrast with the λ_{Max} test statistic, the λ_{Trace} test statistic shows that there is one cointegrating vector. Johansen and Juselius (1990) suggested that the λ_{Max} test might be better than the λ_{Trace} test. Thus, it is concluded that there is no cointegration for population and the real GDP per capita in the Philippines. On the whole, the study finds no long-run relationship between population and the real GDP per capita.

The results of Granger-causality test are reported in Table 3. Generally, there is some evidence that population and economic growth are Granger-causality to each other. For Indonesia, the finding is consistent with those of Dawson and Tiffin (1998) and Thornton (2001) that population growth neither Granger causes economic growth, nor is caused by it. In other words, population growth neither stimulates economic growth nor detracts from it. For Thailand, there is bi-direction causality between population and economic growth, which the results are contradicted with those of Dawson and Tiffin (1998) and Thornton (2001). For Singapore and the Philippines, population growth is found to Granger cause economic growth. For Malaysia, economic growth is found Granger cause population growth.

Generally, there is no evidence that population growth and the real GDP per capita growth are Granger-causality to each other, except the Philippines, population growth is found to Granger causes the real GDP per capita growth. In short, population growth neither causes the real GDP per capita growth, nor is caused by it. In other words, population growth neither stimulates the real GDP per capita growth nor detracts from it. Thus, the finding of the study is similar to the findings of Dawson and Tiffin (1998) and Thornton (2001).

CONCLUDING REMARKS

Population growth in the developing countries is seen as a factor that has a significant impact on the economic development in those countries. An intricate relationship between population growth and economic performance has

remained a focus of debate in economic development literature. This paper chose five Southeast Asian countries (i.e., Malaysia, Indonesia, Singapore, Thailand and the Philippines) as case studies to examine the existence of the long-run relationship and causality between economic development and population growth. The empirical results apparently confirm the previous researches' conclusion that there has been no statistically significant relationship between these two variables.

The result of the unit root tests indicates that both variables (population and the real per capita GDP) are integrated of order one. However, results of the Johansen cointegration tests indicate that there is no long-run relationship between population and the real per capita GDP. On the other hand, the results of Granger causality test indicate the existence of Granger-causality between these two variables in some countries. For example, population growth is found to Granger cause the real per capita GDP growth in the Philippines and Singapore.

In short, there is still a lack of empirical evidence that population growth causes the real per capita GDP growth, or is caused by it. Thus, the findings of the present study do not contradict the findings of the researches by Dawson and Tiffin (1998) and Thornton (2001). The future research could use different data sets to re-examine this issue. Also, it could be interesting to extend similar empirical studies to other developing countries in Africa or in Latin America.

REFERENCES

Ahlburg, Dennis A (1996). "Population and Poverty", in Dennis A Ahlburg, Allen C. Kelley and Karen Oppenheim Mason (eds.), *The Impact of Population Growth on Well-being in Developing Countries,* Berlin, Springer, pp.219-258.

Akaike, Hirotsugu (1971). Statistical Predictor Identification, *Annals of the Institute of Statistical Mathematics*, 22, pp. 203-217.

Akaike, Hirotsugu (1973). Maximum Likelihood Identification of Gaussian Autoregressive Moving Average Models, *Biometrika*, 60(2), pp. 255-265.

Brown, Lester (1976). *Twenty-Two Dimensions of the Population Problem,* Washington, D.C,: Worldwatch Institute.

Buchholz, Todd G. (1999). *New Ideas From Dead Economist,* New York, Penguin Book Limited.

Dawson, D.J. and Richard Tiffin (1998). "Is There a Long-Run Relationship between Population Growth and Living Standard? The Case of India", *The Journal of Development Study,* 34(5), pp.149-156.

Dickey, David A. and Fuller, Wayne A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root, *Journal of the American Statistical Association*, 74 (366), pp. 427-431.

Easterlin, Richard A (1967). "Effect of Population Growth in the Economic Development of Developing Countries", *The Annals of the American Academy of Political and Social Sciences,* 369, pp.98-108.

Granger, C.W.J. (1969). Investigating Causal Relations by Econometric Models and Cross Spectral Models, *Econometrica*, 37, pp. 424-438.

Herrick, Bruce and Charles P. Kindleberger (1983). *Economic Development,* Singapore, McGraw-Hill Book Co.

Johansen, Soren (1988). Statistical Analysis of Cointegration Vectors, *Journal of Economic Dynamics and Control*, 12, pp. 231-254.

Johansen, Soren and Juselius, Katarina (1990). Maximum Likelihood Estimation and Inference on Cointegration - with Applications to the Demand for Money, *Oxford Bulletin of Economics and Statistics*, 52(2), pp. 169-210.

Kelley, Allen C. and Robert M. Schmidt (1996). "Toward a Cure for the Myopia and Tunnel Vision of the Population Debate: A Dose of Historical Perspective", in Dennis A Ahlburg, Allen C. Kelley and Karen Oppenheim Mason (eds.), *The Impact of Population Growth on Well-being in Developing Countries,* Berlin, Springer, pp.11-35.

Kremer, Michael (1993). "Population Growth and Technological Change", *Quarterly Journal of Economics,* 108(3), pp.681-716.

Kuznets, Simon (1967). "Population and Economic Growth", *American Philosophical Society Proceeding,* 2, pp.170-193.

MacKinnon, James G. (1996). Numerical Distribution Functions for Unit Root and Cointegration Tests, *Journal of Applied Econometrics*, 11, pp. 1601-1618.

Malthus, Thomas (1798). *An Essay of the Principle of Population and a Summery View of the Principles of Population,* London: Pickering.

Meade, James (1971). *The Economic and Social Structure of Mauritius,* London, Methuen.

Meadows, Donnella H., Dennis L. Meadows, Jørgen Randers and William W. Behrens, III. (1972). *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind,* New York, Universe Books.

Phillips, Peter C.B. and Perron, Pierre (1988). Testing for a Unit Root in Time Series Regression, *Biometrika*, 75(2), pp. 335-346.

Samuelson, Paul (1975). "The Optimal Growth Rate for Population", *International Economic Review,* 16, pp.531-538.

Simon, Julian L (1992). *Population and Developing Countries,* Princeton, N.J., Princeton University Press.

Simon, Julian L. (1996). *The Ultimate Resource,* Princeton, N.J., Princeton University Press.

Simon, Julian L, (ed.) (1997). *The Economics of Population: Key Modern Writings,* Lynne, N.H., Edward Elgar Publishing Limited.

Thirlwall, Anthony P, (1972). "A Cross-Section Study of Population Growth and the Growth of Output and Per Capita Income in a Production Function Framework", *The Manchester School,* 40, pp.339-359.

Thirlwall, Anthony P. (1994). *Growth and Development,* Basingstoke, Macmillan Press.

Tinbergen, Jan (1985). "World Development Report 1984: Review Symposium", *Population and Development Review,* 11, pp.137-138.

Thornton, John (2001). "Population Growth and Economic Growth: Long-Run Evidence From Latin America, *Southern Economic Journal,* 68(2), pp.464-468.

Todaro, Michael (2000). *Economic Development,* Essex: Pearson Education Limited.

APPENDIX

Table 1: The Results of the Dickey and Fuller (1979) and Phillips and Perron (1988) Unit Root Test Statistics

Indonesia	t_γ - trend	$Z(t_\gamma)$ – trend
$\ln POP_t$	-3.6993*(1)	0.88159(3)
$\Delta \ln POP_t$	-2.7944(4)	-2.79355(3)
$\Delta^2 \ln POP_t$	-4.1781**(0)	-4.15395**(3)
$\ln Y_t$	-2.5632(2)	-2.49849(3)
$\Delta \ln Y_t$	-5.3667**(0)	-4.58228**(3)
Malaysia		
$\ln POP_t$	-5.6534**(1)	-2.21608(3)
$\Delta \ln POP_t$	-2.2737(1)	-2.01028(3)
$\Delta^2 \ln POP_t$	-5.5742**(0)	-5.31847**(3)
$\ln Y_t$	-3.1462(1)	-3.02640(3)
$\Delta \ln Y_t$	-4.0735**(0)	-4.50382**(3)
Philippines		
$\ln POP_t$	.58559(0)	0.46090(3)
$\Delta \ln POP_t$	-5.4782**(0)	-5.77706**(3)
$\Delta^2 \ln POP_t$	-5.3839**(2)	-13.45022**(3)
$\ln Y_t$	-1.8205(1)	-2.18515(3)
$\Delta \ln Y_t$	-4.7335**(0)	-5.26820**(3)
Singapore		
$\ln POP_t$	-1.9114(1)	-1.26859(3)
$\Delta \ln POP_t$	-3.3793*(0)	-3.52831*(3)
$\Delta^2 \ln POP_t$	-6.2605**(0)	-6.75703**(3)
$\ln Y_t$	-.91469(3)	-2.67309(3)
$\Delta \ln Y_t$	-11.7902**(0)	-6.63141**(3)
Thailand		
$\ln POP_t$	1.5952(1)	3.14586(3)
$\Delta \ln POP_t$	-3.9717*(0)	-3.53716*(3)
$\Delta^2 \ln POP_t$	-5.3733**(2)	-11.93756**(3)
$\ln Y_t$	-4.2863*(3)	-4.28486**(3)
$\Delta \ln Y_t$	-4.6561**(3)	-5.46410**(3)

Notes: ln is logarithm. Δ is the first difference operator. Δ^2 is the second difference operator. POP_t is population. Y_t is the real GDP per capita. t_γ is the Dickey-Fuller (DF) or Augmented Dickey-Fuller (ADF) t-statistic. $Z(t_\gamma)$ is the Phillips and Perron (1988) t-statistic. Values in parentheses are the lag length used in the estimation of the unit root test statistics. Critical values for t_γ ($Z(t_\gamma)$) with a drift and a time trend (trend) at 1% and 5% for sample size 45 are -4.18 and -3.51, respectively (MacKinnon, 1996). ** denotes significance at 1 percent level. * denotes significance at 5 percent level.

Table 2: The Results of the Johansen (1988) Likelihood Ratio Test Statistics

	λ_{Max} Test Statistic		λ_{Trace} Test Statistic	
H_0:	r=0	r<= 1	r=0	r<= 1
H_a:	r=1	r= 2	r≥1	r≥2
Indonesia	17.2226*	8.2509*	25.4735*	8.2509*
Malaysia	12.8616	.082367	12.9440	.082367
Philippines	13.2238	6.1903	19.4141*	6.1903
Singapore	7.9733	.87647	8.8498	.87647
Thailand	9.1933	6.8783	16.0715	6.8783
c.v.	14.8800	8.0700	17.8600	8.0700

Notes: For Indonesia, Malaysia and the Philippines, the VAR=2 is used in the estimation. For Singapore and Thailand, the VAR=1 and VAR=3 respectively are used. c.v. denotes 95 percent critical value. * denotes significance at 95 percent critical value.

Table 3: The Results of Granger-Causality Test

	$\Delta \ln POP_t \rightarrow \Delta \ln Y_t$	$\Delta \ln Y_t \rightarrow \Delta \ln POP_t$
Indonesia	2.94	3.65
Malaysia	1.28	11.75**
Philippines	8.46**	3.34
Singapore	10.18**	0.22
Thailand	7.99*	4.40*

Notes: Δ is the first difference operator. ln is logarithm. POP_t is population. Y_t is economic growth. The arrow "$\rightarrow$" denotes no Granger-causality. * Denotes significance at 5 percent level.

Ensuring Sustainable Economic Development in Malaysia
Through High-Linkage Industries

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ABSTRACT

If one were to trace Malaysia's development, one would discover that the economy has relied heavily on a few major contributors, such as agriculture, mining, and forestry and forest-based industries (FBIs). With new emphasis on the manufacturing sector as the engine of growth back in 1959, the economy started to diversify into producing other products. To complement the positive growth enjoyed by most of the economic sectors, various incentives and the Promotion Investment Act (PIA) were introduced in 1968 and 1986, respectively. Industrial Master Plan 1 (IMP1) and Industrial Master Plan 2 (IMP2), which covered the years between 1986 and 1995 and 1996 and 2005, further enhanced the nation's economic growth. With the moderate economic growth worldwide, the critical issue would be whether we are prioritizing the right sectors to sustain the economy. Stated differently, are there any other sectors with good potential that should be promoted? Before any conclusions can be drawn about the choice of sectors to sustain economic growth, an in-depth understanding of both forward and backward linkages of all sectors in the national economy must be established. Therefore, this paper not only highlights linkages using an input-output (I-O) model but also identifies sectors with potential for continuous economic growth now and in the future.

INTRODUCTION

Malaysia has traveled a long way before reaching her present status as one of the fastest developing nations in the Asian region. Starting as a resource- or commodity-based nation, Malaysia shifted the focus of her development to that of a manufacturing-based economy back in 1959. Since then, Malaysia has further strengthened her capacity not only as a major exporter of primary commodities but also as an emerging competitor in the manufacture of electronic products. This has enabled Malaysia to chart her name along with other well-known nations in international trade track records. The shift from a resource- or commodity-based economy to a manufacturing-based one can easily be traced by looking at the gross domestic product (GDP) contribution of particular economic sectors. For instance, agriculture, livestock, forestry, and fishing treated as a sector contributed about 23% to the GDP in 1980 (Table 1). As the focus of the economy started to shift to manufacturing, one could see a rather constant GDP share of more than 9% between year 2000 and 2002. On the other hand, the share of GDP from the manufacturing sector improved from 20% in 1980 to 36.14% in 2000, even though it was estimated to drop slightly to 34.5% in 2002 (Table 1).

Table 1 also indicates that the total value of GDP expanded almost five times between 1980 and 2000. In a more recent publication, the real GDP in 2003 has in fact, expanded by 5.2%, which was well above the 4.5% estimated earlier (Bank Negara 2004). The real GDP growth recorded for 2002 was 4.1% (Bank Negara 2004). The real GDP is further predicted to grow about 5.5% in 2004 and 2005, notwithstanding moderate overall growth of the world economy.

Table 1: Gross domestic product (GDP) of selected sectors, Malaysia in 1987 constant prices (RM million)

Economic Activity/sector	GDP in 1980/Share of GDP (%)	GDP in 2000/Share of GDP (%)	GDP in 2001/Share of GDP (%)	GDP in 2002/Share of GDP[e] (%)
Agriculture, livestock, forestry, and fishing	19,190 (23.00)	17,687 (9.15)	18,269 (9.45)	18,478 (9.55)
Mining and quarrying	4,487 (10.00)	14,416 (7.46)	15,892 (8.22)	16,217 (8.38)
Manufacturing	8,742 (20.00)	69,867 (36.14)	63,536 (32.85)	66,805 (34.54)
Building and construction	2,066 (5.00)	6,996 (3.62)	7,159 (3.70)	7,434 (3.84)
Transport and communication[1]	2,543 (6.00)	16,694 (8.64)	18,317 (9.47)	19,301 (9.98)
Finance and insurance[2]	3,686 (8.00)	26,161 (13.53)	28,548 14.76)	30,902 (15.98)
Government services	4,563 (10.00)	14,395 (7.45)	15,058 (7.79)	15,712 (8.12)
Other services[3]	7,045 (15.00)	54,497 (28.19)	56,840 (27.00)	59,201 (26.98)
Less: Imputed bank service charges	854 (2.00)	16,000 (8.32)	17,902 (9.26)	20,024 (10.35)
Add import duties	2,046 (5.00)	4,742 (2.45)	4,762 (2.46)	5,373 (2.78)
GDP at market price[4]	44,514 (100)	209,365 (100)	210,480 (100)	219,400 (100)

Source: Malaysia, Ministry of the Primary Industries (1993, 2002).
Note: [1]includes storage, [2]includes real estate and business, [3] includes electricity, gas and water, wholesale and others [4] total may not be exactly equal to 100% due to rounding-off. [e]Denotes estimates

The excellent growth of the national economy during the past decade, i.e., before the economic turmoil that hit the Asian region in late 1997, was supported by several incentives, such as the aggressive export (AE) and free zone (FZs) strategies. Both strategies were introduced under the Investment Incentives Act of 1968 and in 1971, whereas the Promotion Investment Act (PIA) was introduced in 1986 (Malaysian Industrial Development Authority, 1986). To further encourage the development of manufacturing industries in Malaysia, Industrial Master Plan 1 (IMP1) and Industrial Master Plan 2 (IMP2), which covered the years between 1986 and 1995 and 1996 and 2005, respectively, were introduced. It was through IMP1 that the manufacturing sector in general started to diversify into other types of production. In fact, IMP1 identified 12 subsectors to be developed. These subsectors include seven resource-based industries (RBIs) (rubber products, palm-oil products, food processing, wood-based/forest-based products, chemicals and petrochemicals, nonferrous metal products, and nonmetallic mineral products) and five non-RBIs (electrical and electronics, transport equipment, machinery and engineering products, iron and steel, and textiles/apparel). Besides the services sector, manufacturing and agriculture are two sectors that received special attention to sustain economic growth until 2010 (Economic Planning Unit, Prime Minister's Department 2001).

The economic performances of most strategic sectors were shaken by the economic turmoil that hit the Asian region in late 1997, as well as the strike on September 11, 2001, and the severe acute respiratory syndrome (SARS) epidemic in the first half of 2003. All of these occurrences have affected the economic performances not only of Malaysia but also of other developing countries. Even though Malaysia may be considered able to handle such unexpected shocks, the impact on the national economy was substantial. The pegging of Ringgit with the US dollar with the intention of revitalizing the economy has helped control the situation. Nonetheless, prolonged pegging may provide an inaccurate representation of the nation's whole economic situation. The belief that Malaysia is performing well in the international arena, especially trade, may turn out to be different should a real exchange rate be applied. To ensure continuous and stable economic growth, focus should not be placed on certain economic sectors. In short, every effort must be made to encourage sectors with good potential for growth. To be able to do that, one must understand the technological linkages between sectors in the economy. Through both forward and backward linkages, key sectors may be identified more easily. A key sector is one that has strong forward and backward linkages and is able to stimulate not only its own growth but also the growth of other sectors in the economy. To complement the existing economic growth, this paper aims to highlight both the high-linkage industries/sectors and key sectors of the national economy using the input-output model.

THE INPUT-OUTPUT MODEL

The analytical framework for the input-output (I-O) model was developed by Wassily Leontief in the late 1930s. Basically, an I-O model is constructed to examine the interdependence or technological relationship of industries in a given economy. With such a model, one can trace the movement of goods and services from one sector to another. This indirectly indicates whether such an industry is highly or not highly dependent on other industries in its process of producing a certain level of output. To establish the technological relationship between and among industries, Leontief (1951) further devised production equations relating the level of output in each sector to the level of production in all sectors of the economy. On the basis of these equations, he then worked out a set of simultaneous linear equations relating the relationships among the various sectors in the economy. A simple Leontief simultaneous linear equation is as follows:

$$X_i = \Sigma_{j=1} \, x_{ij} + Y_i \qquad (Eq.1)$$

$$(i=1,2,3...n)$$

where

X_i = total output of sector i
x_{ij} = output of sector i used as input in sector j
Y_i = total final demand for sector i's product

The make and absorption matrices

Two matrices of concern in building an I-O model are the make matrix, which records the values of commodities produced, and the absorption matrix, which exhibits the value of commodities purchased to produce outputs. For the purpose of discussion, focus will be placed on the absorption matrix (Tables 2).

Altogether, there are four quadrants in the absorption matrix (Table 2). The first quadrant is called the transaction matrix. This matrix consists of rows and columns that mark the allocation of output from each sector and the input by that sector, respectively. For instance, sector 3 in row 3 sells x_{32}, $x_{33,}$ through x_{3n} units of output to all the other sectors in the economy, while at the same time reserving some x_{31} for its own consumption.

Simultaneously, sector 3 in column 3 also purchases inputs x_{23}, $x_{33,}$ and x_{n3} from other sectors and x_{13} from itself as inputs of production. In Table 2, W_3 represents the total intermediate use of sector 3's products, whereas the total purchases of inputs of sector 3 are given by U_3. Similar explanations are also applicable to other intermediate sectors.

Value-added or primary inputs, consisting of labour, capital, imports, and others, are listed in the third quadrant. The symbol V_3 in Table 2 represents the entry for sector 3's value-added input, whereas other Vs represent other sectors' value-added inputs. The fourth quadrant represents the direct input of primary factors to final use (e.g., domestic services and government employment).

Table 2**.:** Example of an Absorption or Interindustry Matrix of an I-O Model

		Purchasing Sector	Total Intermediate	Final Demand	Total Output
	1	x_{11} x_{12} x_{13} ... x_{1n}	W_1	Y_1	X_1
	2	x_{21} x_{22} x_{23} ... x_{2n}	W_2	Y_2	X_2
Producing sector	3	x_{31} x_{32} x_{33} ... x_{3n}	W_3	Y_3	X_3
	.	. . . .	.	.	.
	n	x_{n1} x_{n2} x_{n3} .... x_{nn}	W_n	Y_n	X_n
Total intermediate inputs		U_1 U_2 U_3 ... U_n			
Primary inputs		V_1 V_2 V_3 ... V_n			
Total inputs		X_1 X_2 X_3 ... X_n			

Source: Norini (2000).

The sectoral linkages/technological interdependence

To strive for sectors that have strong forward and backward linkages or technological interdependence has always been the way to stimulate the growth of an economy. Such sectors have been proven empirically to be able to stimulate not only themselves but also other sectors that use their outputs as factors of production. Sectors with strong forward and backward linkages will form the key sectors in a given economy.

For decades, efforts were geared to developing several techniques for estimating linkage effects and identifying key sectors in an economy. To date, most empirical analyses of estimating linkages and identifying key sectors commonly have used techniques from Rasmussen (1956), Chenery-Watanabe (1958), Yotopoulos and Nugent (1973), Jones (1976), Shultz (1977), Bulmer-Thomas (1982), and Dietszenbacher (1992). Rasmussen was the first researcher to develop a technique for measuring linkage indices, whereas the others were either improving it or applying it empirically. Readers interested in finding out more about the various techniques are advised to refer to the original manuscripts.

For the purpose of this paper, the most recent technique for measuring linkages and identifying key sectors, developed by Dietszenbacher (1992), is discussed and used in the analysis. He devised a technique called the eigenvector method. According to Dietszenbacher, the elements of the Perron vector, i.e., the eigenvector corresponding to the dominant eigenvalue of a matrix, could be used for measuring interdependencies between and among sectors in an economy. The eigen-equation may be mathematically expressed as follows:

$$Ax = \lambda x \qquad \textit{(Eq. 2)}$$

where

A = n X n matrix
λ = eigenvalue, latent root, or characteristic value of matrix A
n^{th} = column vector x as an eigenvector, latent vector, characteristic vector of A

Dietszenbacher (1992) used the input coefficients of matrix A and output matrix B in measuring backward and forward linkages. One special feature of the technique popularised by Dietszenbacher over other techniques is its ability to detect clusters of sectors. This would allow the detection of inaccuracies.

SOURCES OF DATA

Data used in the analyses came mainly from the I-O tables of 1990 published by the Institute of Developing Economies (1997). Unlike using the I-O table from the Department of Statistics, Malaysia, the I-O table developed by the Institute of Developing Economies had to be balanced first, using a computer programme developed for that purpose (Norini 2000).

RESULTS AND DISCUSSION

Analyses carried out by Norini (2000) based on the I-O table of 1990 indicated that the eigenvalues for backward linkages ranged from 0.0150 (mining and quarrying sector) to 24.9580 (private nonprofit organization sector), whereas the forward linkage eigenvalues ranged from 0.0000 (private nonprofit organization sector) to 4.6784 (oil and fats sector). The analyses of backward and forward linkages using the I-O table of 1990 involved 60 sectors. The eigenvalues for 1990 were slightly lower than those from the analyses carried out based on the I-O table of 1987, published by the Department of Statistics, Malaysia. The enginvalues for backward linkages in 1987 ranged from a low of 0.0605 (mining and quarrying sector) to a high of 23.1100 (oil and fats sector).). On the other hand, the eigenvalues for forward linkages had a much lower range, from 0.0000 (private nonprofit organization sector) to 13.7790 (oil-palm estates sector).

Table 3 provides the eigenvalues for selected sectors in the economy. Clearly, among the sectors listed, the furniture and fixtures sector had a much higher eigenvalue for backward linkages compared to the other forest-based sectors, such as forestry and logging, sawmilling, and paper production and printing. This indirectly indicates that the furniture and fixtures sector had a stronger technological relationship with other sectors in the economy than did the other forest-based sectors. A direct interpretation of the analyses for backward linkages indicated that the sawmilling sector had a much stronger bond with the rest of the economy.

A comparison with the much-disaggregated I-O table of 1987 (a combination of an I-O table by the Department of Statistics, Malaysia, and a partial I-O table specially developed for the forest-based industries (Norini 2000) yielded different results. Based on the disaggregated I-O table, the eigenvalue for backward linkages of the sawmilling sector was 0.2038, which indirectly indicated a weak technological relationship with the rest of the economic sectors. The partial I-O table for forest-based industries developed by Norini (2000) treated sawmilling as a sector by itself, whereas the sawmilling sector in the I-O table of 1990 included several subsectors. Stated differently, the more aggregated a sector, the higher is the possibility of getting the eigenvalue. This is the specialty of Dietszenbacher's (1992) technique over other techniques of measuring linkages and key sectors, i.e., its ability to detect the effects of clusters of sectors.

The eigenvalues derived for both backward and forward linkages were further subjected to a ranking process. The rule of thumb is that those sectors that fall within the top 25% of the total population of sectors are considered to have strong backward and forward linkages. Table 5 provides a ranking of the 60 sectors, indicating whether a sector has strong backward and forward linkages or low linkages with other sectors.

Unfortunately, analyses carried out on the 1990 I-O table indicated that there was no key sector for that particular year. Nonetheless, the 15 sectors identified as having strong backward and forward linkages were sufficient to guide policy makers in making rational decisions with regard to sectors for further development. As stated earlier and again in this section, sectors to be developed can come from those that have either strong backward or forward linkages or sometimes those considered high-linkage industries. Both types of linkages are equally effective in encouraging the development of other industries due to their strong technological relationship with other sectors.

Table 3: Eigenvalues for backward and forward linkages of selected sectors, Malaysia (1990)

Sector or Industry	1990 (U. $_j$)	1990 (U$_i$.)
Forestry and logging	0.0203	2.6522
Sawmilling	0.4718	7.9735
Furniture and fixtures	3.6414	0.0325
Paper production and printing	0.1895	1.9344
Oil palm estates	0.1957	1.1288
Industrial chemicals	0.2297	4.2417
Oil and fats	0.3398	4.6784

Source: Norini (2000)
Note: U.j denotes backward linkage, U$_i$. denotes forward linkage.

Table 4: Linkages and Key Sectors - The Dietzenbacher Technique, Malaysia (1990)

Sector or Industry	Key Sector	Strong Backward Linkages	Strong Forward Linkages	Low linkages
Forestry and logging			Yes	
Sawmilling			Yes	
Furniture and fixtures		Yes		
Paper production and printing			Yes	
Agriculture and others				Yes
Rubber planting			Yes	
Oil palm estates				Yes
Livestock				Yes
Fishing				Yes
Mining and quarrying			Yes	
Meat and dairy production		Yes		
Fruit, vegetables, fish, and other food processing (preserved food)		Yes		
Oil and fats			Yes	
Grain milling				Yes
Bakeries and confectionery industries		Yes		
Animal feedstuffs		Yes		
Beverages Industries				Yes
Tobacco				Yes
Manufacturing of textiles				Yes
Manufacturing of wearing apparel				Yes
Industrial chemicals			Yes	
Paints and lacquers		Yes		
Other chemical industries				Yes
Petroleum and coal industries				Yes
Rubber processing				Yes
Rubber industries				Yes
Plastic production				Yes

Table 4: Linkages and Key Sectors - The Dietzenbacher Technique, Malaysia (1990) (continued)

Sector or Industry	Key Sector	Strong Backward Linkages	Strong Forward Linkages	Low linkages
China, glass, and clay industries				Yes
Cement, lime, and plaster				Yes
Other nonmetal industries		Yes		
Basic metal industries			Yes	
Other metal industries				Yes
Nonelectrical machinery			Yes	
Electrical machinery				Yes
Motor vehicles				Yes
Other transport equipment		Yes		
Other manufacturing				Yes
Electricity and gas production			Yes	
Water works and supply		Yes		
Building and construction				Yes
Wholesale and retail trade			Yes	
Hotels and restaurants			Yes	
Transport			Yes	
Communication				Yes
Financial institutions				Yes
Insurance				Yes
Real estate and dwellings			Yes	
Business services			Yes	
Private education		Yes		
Private health		Yes		
Recreation and culture				Yes
Repair vehicles		Yes		
Other repair and cleaning		Yes		
Public administration and defence				Yes
Government education				Yes
Government health				Yes
Other government institutions				Yes
Private nonprofit institutions		Yes		
Other private services		Yes		

Source: Norini (2000)

CONCLUSION

Analyses carried out based on the I-O table of 1990 indicated that no single sector fulfilled the criteria of a key sector, i.e., a sector that has both backward and forward indicators or eigenvalues larger than one (Dietzenbacher 1992). Nonetheless, sectors that have strong backward and forward linkages would automatically encourage the development of other industries, thus leading to economic development (Hirschman 1958). In other words, should there be no key sector, sectors that have either strong backward or forward linkages can still be considered as having potential for encouraging economic development.

The 12 subsectors identified under IMP1 for development do not seem to fit well with the criteria as key sectors. For example, rubber products and textiles/apparel, even though targeted for development, were both found to have low linkages with other sectors. Perhaps the selection of rubber products as a sector for development was meant more for political stability rather than being based on economic reasoning. The analyses of linkages using Dietzenbacher's (1992) technique also helped identify a few other high-linkage sectors/industries, which could be other options enabling policy makers to make better choices. Sectors that had either strong backward or forward linkages, among others, were electricity and gas, water works, wholesale and retail trade, and others (Table 4).

One may question the applicability of the results derived from such a study, as it was based on the I-O table of 1990. Nonetheless, because it usually takes some time for technological change to occur, information generated from such analyses might still be considered applicable to the current situation. Above all, to be able to arrive at good decisions, policy makers need to make full use of all possible information. In this context, information at hand must be not only reliable but also available and timely in assisting decision makers.

REFERENCES

Bank Negara. 2004. *Bank Negara Annual Report* 2004. 58pp.

Bulmer-Thomas, V. 1982. Input-Output Analysis in Developing Countries. London: John Wiley & Sons Ltd. 297p.

Chenery, H.B. & T. Watanabe. 1958. International Comparison of the Structure of Production. *Econometrica*, Vol. **26**, pp. 487-521.

Dietzenbacher, E. 1992. The measurement of interindustry linkages-Key sectors in the Netherlands. *Journal of Economic Modelling*, 9 (4), 419-437.

Economic Planning Unit, Prime Minister's Department Malaysia. 2001. *The third outline perspective plan 2001-2010*. Kuala Lumpur: Percetakan Nasional Malaysia Bhd. ISSN 967-99911-1-3

Institute of Developing Economies. 1997. Malaysia Input-Output Table 1990. *Asian International Input-Output Series* No. 48.

Jones, L.P. 1976. The measurement of Hirschmanian linkages. *Quarterly Journal of Economics*, pp 323-333.

Leontief, W. 1951. The Structure of the American Economy 1919-1939. New York: Oxford University Press.

Malaysia, Ministry of Primary Industries. 1992. *Statistics of Commodities*. Kuala Lumpur.

Malaysia, Ministry of Primary Industries. 2002. *Statistics of Commodities*. Kuala Lumpur.

Malaysian Industrial Development Authority. 1986. Malaysia-Investment in the manufacturing sector. Kuala Lumpur: Ampang Press Sdn. Bhd.

Norini, H. 2000. Structural interdependence of Malaysian industries with special emphasis on the forest-based industries. Unpublished Ph. D Thesis, The University of Wales, Aberystwyth United Kingdom.

Rasmussen, P.N. 1956. Inter-Sectoral Relations. Amsterdam: North Holland Publication Co.

Schultz, S.1977. Approaches to identifying key sectors empirically by means of input-output. *Journal of Development Studies*, Vol.14, No.1. pp 77-96.

Yotopoulos, P.A & Nugent, J.B. 1973. A balanced-growth version of the linkage hypothesis: a test. *The quarterly Journal of Economics*, Vol. LXXXVII, No.2 pp 157-171.

The Endogenous Development Model:
Its Relevance as An Alternative Development Model for ASEAN 10 Plus 3

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ABSTRACT

As ASEAN 10 plus 3 (Japan, China and the Republic of South Korea) move towards regional and economic integration, one of the most challenging issues facing its members, is the process and nature of the region's economic development. This paper raises for consideration *endogenous development* as an alternative development model. Endogenous development includes *sustainable development* but goes beyond it, to emphasize the importance of "community-based" and "community supported" development which is conscious, respectful and in harmony with local characteristics, a community's cultural heritage and traditions. It has particular relevance to Japan Incorporated's experience and that of other Asian countries practising state developmentalism where communities are particularly at risk of being marginalized from the development process. With corporate social responsibility or responsible governance concerns recently sweeping the region, the adoption of endogenous development as a public development policy by Japan Incorporated, would be consonant with the trend towards internal corporate social and environmental audits. Japan's increasing integration with international developments require Japan Incorporated to make endogenous development the basis of its national development policy. Japan's experience offers illuminating insights on the possible future direction of the process and nature of development to other members of ASEAN 10 plus 3.

INTRODUCTION

With its formation in 1997, ASEAN 10 plus 3 (Japan, China and the Republic of Korea) or TPT (Ten plus Three) opened the way for regional cooperation process and a newly defined identity as an East Asian grouping. TNT listed the economic area as one of its focal points of cooperation in "The Joint Statement of the East Asian Cooperation," November 1999. As TPT move towards regional and economic integration, one of the most challenging issues facing the region, is the process and nature of the region's economic development. This paper raises for consideration *endogenous development* as an alternative development model. Endogenous development includes and goes beyond the concept of sustainable development to emphasize the importance of "community-based" and "community supported" development which is conscious, respectful and in harmony with local characteristics, a community's cultural heritage and traditions.

It has particular relevance in Japan Incorporated's experience and that of other Asian countries practising state developmentalism where communities are particularly at risk of being marginalized. Japan, as the largest economy in the region, is a key factor in TPT. It had also earlier led the region's economic convergence described as the "flying geese model." As Japan's economy underwent transformation and rapid expansion in the race towards industrialization in the 1950s and 1960s, it experienced serious environmental degradation and pollution which severely threatened public health and the quality of life of the Japanese people. Insustainable economic development led to a confrontation between Japan Incorporated and the Japanese people which eventually from the late 1960s onwards, led to the enactment of a succession of national and international environmental laws. The question arises,

was this merely a reactive political response or was it in fact, a policy change to adopt an *alternative economic development model*? This paper attempts to discuss various alternative development theories and to determine the relevance of the Endogenous Development Theory and Model to Japan and the other members of TPT.

LITERATURE REVIEW: THE JAPANESE DEVELOPMENT EXPERIENCE

Finding the right balance between environmental conservation and economic development, has been a controversial and thorny issue in Japan. When Japan was trying to catch up economically with Western industrial states, the Japanese Government assigned top priority to economic development. The pursuit of economic development was often conducted at the expense of other policy agendas, such as environment conservation and protection of nature. As a result, the rapid expansion of national production in Japan during the 1950s and 1960s was accompanied by equally rapid deterioration of environmental condition and the destruction of nature. Broadbent (1998) called this quandary about development -" environment relations a growth-environment dilemma."
For quite some time in Japan's modern history, the environmental concerns had been a matter of a secondary importance. The primary issue was finding the ways to speed up economic development. Furthermore, there had been a prevailing belief that the benefits of economic development outweighed the cost of pollution. As it became evident from the first of Japan's major pollution accidents, the Ashio copper mine pollution case which had occurred in the beginning of the 20th century, the prevailing perception in Japan had been that the public benefits accrued for the country were far more important than the well-being of the local residents whose health condition had been deteriorating as a result of pollution (Martinez-Alier, 2000).

Only in the 1970s environmental considerations were recognised as an issue of importance and the government began to take matters concerning environment conservation more seriously (Mori, 2003). During that decade environment-related issues emerged as an important policy agenda. This could indicate that in the 1970s there occurred a "paradigm shift" in Japan's public administration.

This transformation could be explained by employing the Ecological Modernization Theory. Mol and Spaargaren (1993) point out that in modern society the ecological sphere has been given a status on a par with that of economic and political spheres. In other words, there has been a change in the discursive practice. As a result of this change, complete neglect of the environment became no longer acceptable as legitimate position (Mol and Sonnenfeld, 2000). Similar change of perceptions has occurred in Japan as well. Environmental reform that took place in the country firmly placed the environmental discourse on the equal level of prominence and importance that political and economic discourses had been enjoying all the while.

The question arises: what factors were crucial for ushering the environmental reform and bringing about the changes in the discursive practice in Japan? Environmental social scientists maintain that collective actions and protests have been the most important elements in this process. According to a prominent social scientist and environmental activist, Jun Ui (1989), collective action was the most crucial determining factor in Japan's environmental reform. In a similar vein, Broadbent (1998) concludes that environmental movement was indispensable in bringing about Japan's environmental reform.

Upham (1987) identifies three stages of the environmental movement, that is, (1) petitions; (2) protests: (3) litigation. This classification could be modified to allow including other phases in the environmental movement that led to the environmental reform, that is, (1) occurrence of pollution accident; (2) denial of accusations by the culprit company and/or the government authority: (3) shift from non-confrontational approach to confrontational actions; (4) legal actions, and (5) environmental reform. Below we shall discuss each of the identified five phases.

Occurrence of Pollution Accident

Japan's ruling elite, also known as the "Iron Triangle", consists of politicians from the Liberal Democratic Party, bureaucrats from various ministries and the representatives of big business. After World War II, the "Iron Triangle" set Japan on the development drive. "Mega projects", which were undertaken to create the necessary infrastructure, were regarded as instrumental for the country's industrialization. In the pursuit of development, political and business elites tended to disregard the negative impact that development projects had had on the environment. As a result, industrialisation was accompanied by serious pollution. Commenting on the vast public work empire that the "Iron Triangle" created and supported Mason (1999: 190) observes, "Many of Japan's domestic environmental problems are attributed to the dominance of the 'construction state' (*doken kokka)".

Denial of Accusations

Whenever pollution accidents occurred, the polluters would usually deny the existence of pollution or the casual relationship between the pollution and the damage to the health of local residents. Further, the culprits would use their political connections to intimidate the victims of pollution and prevent any further investigations into the accidents. This happened in the Minamata pollution case where local residents were suffering from an "unknown decease" and where the polluter used its political influence to prevent investigations into the source of health problems that affected people in the area (Ui, 2001).

The above mentioned case was not the only one where the plight of the victims of pollution had been ignored and the investigations into the source of the problem had been obstructed. Developments took similar turn in another case. Thus, in 1955, a medical doctor "alerted the general public to the nature of Itai-itai disease" (Yoshida, et.al, 1999: 217). However, the culprit, Mitsui Mining and Smelting Corporation, denied its moral and legal responsibility for the pollution accident. The Japanese Government tried to clear the air and instituted a study group to inquire into the source of the disease. The group, however, concluded that nutritional deficiencies were one of the causes for Itai-Itai disease outbreak.

In this type of conflict between the victims of pollution and the companies that had been identified as the culprits, the Japanese Government usually took side of and protected the interests of the businesses rather than the people. Close and cosy relations between the government authorities and the representatives of big business often helped to shield the culprits in the pollution accidents from bearing responsibility. As Martinez-Alier (2000) pointed, in the Ashio copper mine pollution case Furukawa Corporation, the culprit, had been profiting from a "novelty and uncertainty of the chemical pollution in question, and from the closeness between the government and business in Japan".

Shift from non-confrontational approach to confrontational actions

In order to improve situation, the residents affected by the pollution brought their petitions to the polluter or the government. It should be noted that in this stage not many people were ready to support the cause of the victims of pollution. Fujikura (2001:471) maintains that, in the early stages, participating in anti-pollution activities involved a risk that the protesters would be regarded unfavourably by their community and perceived as trouble-makers.

However, petitioning by the victims of pollution did not bear fruit as the corporations responsible for the pollution accidents - as well as the government authorities - refused to admit the occurrence of pollution and their responsibility. This left the victims no other choice but to change their tactics. That would mean a shift from non-confrontational approach to confrontational actions. In the case of Minamata disease, for example, as unusual symptoms of an "unknown disease" had been spreading through Minamata in the early 1950s, the victims made a petition to the polluter company, Chisso Corporation, and requested the company to take some actions and improve the situation. For several years, the polluter denied its responsibility. Then the victim changed their tactics and resorted to the confrontational approach that included demonstrations and sit-ins. Almeida and Stearns (1998: 43) thus describe the course of events in Minamata, "The local fishermen and the Mutual Assistance Society (MAS) held rallies and participated in disruptive protests. In late November 1959, the MAS began a month-long sit-in outside Chisso's factory gate aimed at securing a compensation settlement from Chisso. These protests received some media attention". Mass media's coverage of the protests gave prominence to the case and enhanced public awareness of the issue as well as understanding of the plight of the victims.

In Japan, confrontational approach proved to be far more effective than non-confrontational approach in bringing about the much needed environmental reform. The fact was observed by McKean (1981) who commented that the environmental movement in Japan had always started from ineffective anti-pollution petitions and escalated into more effective confrontational actions, including sit-ins, demonstrations, and electoral campaigning.

Legal Actions

In the Minamata pollution case, the polluter responded to the victims' protests and agreed to pay small sums as compensation. In December 1959, the Chisso Corporation signed a contract with the victims of pollution promising to compensate the victims and their families (Almeida and Stearns, 1998).

However, minor concessions failed to satisfy the victims who pointed out that "these amounts were only a small fraction of what MAS initially proposed" (Almeida and Stearns, 1998: 43). In 1973, the residents finally decided to openly challenge the corporation and brought suit against Chisso to court demanding fair compensations (Lasdon, 1974: 47).

In another pollution case that had taken place in the Toyama district, the victims that suffered from Itai-Itai decease as a result of pollution were dissatisfied with the government sponsored research team's report that denied causal relation between the pollution and the "unknown decease". Again, the victims were left with no other choice but taking legal action. In 1972, the people in Toyama district affected by Itai-Itai disease brought a case against the main polluter to court (Yoshida *et al*, 1999: 216).

Environmental Reform

Environmental reform in Japan was largely possible due to the struggle of the victims of pollution accidents and their supporters. McKean (1981) argues that Japan's citizens' environmental movement as well as the confrontational approach were able to successfully alter the local's and central governments' attitudes.

Upham (1987) observes that in the big four Japan's pollution cases, the environmental movement and protests by local residents and their supporters forced the culprit companies and government authorities to implement effective environment control measures. In a similar vein, Broadbent (1998) concludes that confrontational actions and protests by the people were able to push for a better pollution control in Japan.

In short, during the period of high economic growth Japan was faced with the "growth-environment" dilemma. However, although Japan's rapid economic development was accompanied by outbreaks of serious pollution accidents, there also had occurred an environmental reform and a change in the discursive practice in the 1970s when environmental discourse reached the level on a par with other political and economic discourses. As a number of researchers concluded, environmental protests by the affected local residents, victims of pollution and their supporters had played the crucial role in ushering the environmental reform in Japan.

Previous researches are invaluable for the understanding of Japan's economic development issues as it revealed the importance of collective action in Japan's sustainable development process. It also distinguished and described different stages in which the environmental movement in Japan had been developing. The struggle of the victims of environmental degradation and their supporters, culminated in the recognition of the importance of the ecological sphere and brought about the change in the discourse practice. Environmental considerations that had been previously disregarded gained prominence and achieved a status on a par with that of economic and/or political discourse.

However, the main limitation of these earlier researches is that they are empirical in nature and the pollution accidents and ensuing activism and campaigning described in the studies took place before the 1980s. During that period, there was a lack of appropriate mechanisms to ensure that the voice of local communities could be heard. Therefore, the local communities had no other choice but to resort to the confrontational approach including demonstrations and protests. With the enactment of environmental laws, the focus of empirical research should go into the area of implementation of these laws and the extent, if at all, communities participate and are involved. Ultimately however, paradigmic policy changes for Japan can only occur with theoretical research establishing the case for alternative development theories and models.

A THEORETICAL DISCUSSION ON ECONOMIC DEVELOPMENT THEORIES

Economic development theories

The *Western Modernization Theory* which was established in the late 1940s, established the single-track development theory of development. It was anticipated that as a matter of course, this model of American/European development and industrialization would spread to the less developed countries, which would then thread the same path as western industrial nations. Against this dominating theory, the *Third World Development Theory* was introduced in 1960s, followed by the *Dependant Theory* in the 1970s (Tsurumi :1976). The Third World Development Theory insist on the Third World's original pattern of development while the Dependent Theory points out the structural inequality between the center and the peripheral. Both of these theories propose alternatives to the single-track development theory, however, both models of development do not treat the cultural/historical diversity as independent variables (Tsurumi:1976)

Socio-economic development theories

In 1975, the Dag Hammarskjord Foundation submitted a report titled "What Now?" to the special economy session of the UN General Assembly and described the desired nature of development as follows:- (a) development is not simply an economic process, but a complex whole. Endogenous development in each society springs from the culture. There is consequently, no universal formula for development; (b) satisfying the essential needs of the poorest sections of the population so that development is not bound up with structures of exploitation; (3) the present situation is bound up with structures of exploitation; (4) development should take account of the ecological limits associated with social and technological systems (Dag Hammarskjord Foundation, 1974).

The said Report also pointed out four requirements to achieve development as described above as being (a) Satisfying the basic requirements of the life such as food, health, shelter and education; (b) Achieving development by the cooperation of the community in the area;. (c) Achieving development in a manner that harmonizes it with the area's natural environment; and performing contractual reform within the society.

This approach, which treats cultural and historical diversity as independent variables, was termed "another development" and is an antithesis to the neo-classical models of development. It may be observed that "another development" theory is an alternative development theory which gave central focus to the importance of the community as the unit of development. It treats the cultural/historical diversity as independent variables (Tsurumi, 1976). Considerations at community level is considered more important than at national level (Tsurumi, 1980, pp.192-193).

Tsurumi Kazuko's Endogenous Development Theory

In 1976, a year later after Dag Hammarskjord Foundation Report, Tsurumi Kazuko introduced the term "*endogenous development*" in the context of criticizing western modernization theory and thereby became the first enunciator of the *Endogenous Development Theory.*

Tsurumi (Tsurumi, 1980 : 192-193) defined endogenous development as: *"the procedure of change of the society, whose purpose is common among the human beings while the ways to achieve the purpose and the models of society that should realize the purpose are various."* "Common purpose" refers to the creation of conditions, which enable individuals and communities to achieve the basic needs for food, clothing, shelter and medical treatment, and to make full use of their ability as the independent human beings. The way to achieve the "purpose," the model that realizes the purpose and the style of the living, should be independently created by the people or the group in the manner which is suitable to the eco-system of the area, based on their cultural heritage (tradition) without referring to foreign knowledge, technology and system. The term "the group of people" in Tsurumi's definition may be interpreted as "the community".
Tsurumi contends that the Endogenous Development Theory is "value explicit" while the Modernization Theory is "neutral in value". In other words, endogenous development is the collection of the unique experiences of the communities while modernization is just an abstract conception.

The following observations maybe made of the Tsurumi's concept of endogenous development: firstly, it is also "another development" (Dag Hammarskjord Foundation Report) in terms of its emphasis on an alternative way of development to the modernization theory; secondly, in emphasizing the community as being the most important and

most basic unit in this other development theory, it is a socio-economic development theory; thirdly, each community has its own "*traditional wisdom*" or knowledge to deal with the unique nature of their particular environment; fourthly, such knowledge is derived from inherited experience and observation from their forefathers in a particular environment; fifthly therefore, such knowledge may not be universal or extensive in nature but often provides good prescription for that particular community. The discussion on environmental conservation is often for the purpose of finding the universal or standard approach, which can be applied worldwide. However, it is opined that this approach is too limited. The development process should allow the community, with the knowledge of their own environment, to play a role in the decision-making process.

Miyamoto Ken'ichi's Endogenous Development Theory

Over a decade later, Miyamoto Ken'ichi, a prominent Japanese economist, who worked on the issues of Okinawa's development, added a significant economic perspective to Tsurumi's concept of endogenous development.

Miyamoto defined the endogenous development as.the regional development that is performed by the local governments in the manner to improve the welfare of the residents of the area based on the economical development that is enabled by the spontaneous technical development utilizing the area's resources reasonably and sustainably by the corporations and individuals of the area (Miyamoto, 1989:294).

He also stressed the purpose of development should be defined in the context of *environmental sustainability* and ultimately, serve to establish the *human rights* of the residents of the area. For Miyamoto, the environment is the major issue and considered it as the basis of other achievements, including economic development. Miyamoto's Theory also stresses the role of the organization (the local government, NGOs and economical associations) in comparison to the role of the individuals. To utilize the local techniques, industries and culture, it is critical to organize the functional collective actor. In the under-developed areas, corporations are not powerful enough to mobilize the full capacity of the endogenous resources and the neutral and non-profit organization may work more effectively.

It is observed that Miyamoto's Endogenous Development Theory may be considered a policy-oriented endogenous development theory.

Further, according to Miyamoto, endogenous development is implemented by local civil society. This development makes use of the traditional wisdom, for example technology, and is aimed at the promotion of welfare and maintenance of balance between development and the environmental conservation (Miyamoto, 1989: p. 294).

It is observed there is an obvious difference between Tsurumi's and Miyamoto's concepts of the endogenous development. Tsurumi sees the endogenous development as an alternative to the mainstream development model and proposes endogenous development as a substitute to the discourse of developmentalism whereas Miyamoto sees endogenous development as a people-led rural development, which can reinforce the mainstream development model. The latter therefore proposes the complementary role of endogenous development, which can help to maintain social and cultural traditions in the rural and under-developed areas.

OBSERVATIONS ON ENDOGENOUS DEVELOPMENT THEORIES

Despite the abovementioned Japanese academics theoretical elaborations, it may be observed that Tsurumi's and Miyamoto's Endogenous Development Theories may also be perceived as "another development" or "alternative development" as the antithesis to the western development models which are directed at primarily economic development. Thus the endogenous development contributes to the diversification of development theories and strategies and offers emerging economies, a viable alternative development model that has been tested in an East Asian setting.

Endogenous Development Theory emphasizes the importance of the relationship between economical development and socio-cultural elements.

The Theory may be seen as the basis to discuss the possibility of another way of social system building. This view may be supported by three fundamental features of the said Theory :-

The community as the basis of development

As clearly mentioned in Dag Hammarskjord Foundation Report, the community is the most important and most basic unit of the study in the Endogenous Development Theory. It is possible to interpret the term "the group of people" in Tsurumi's definition as the community while Miyamoto insists on the importance of utilization of the local resources by the people of the area, which again can be interpreted as the community. The development can be endogenous only when the people of the area spontaneously and deliberately participate in the development. To mobilize community as the engine of the development, non-governmental organizations can be a major tool for people's participation (Nishikawa, 2004: 20).

The *utilization of traditional wisdom*

Each community has its own knowledge or "traditional wisdom" to cope with the unique nature of the environment of its area. Such conventional wisdom is derived from community experience and observation from ancient times. It cannot be universal or extensive in the nature, but often provides a good prescription for that particular community. This is most obvious in Tsurumi's definition.

The "wisdom" may vary in terms of the field. Yet another Japanese endogenous theorist, As Nakamura (Nakamura: 1986, 2000) pointed out, it can be the methodology of the traditional industry. "One village, one product" initiative in Oita prefecture, which became famous as the trial of endogenous development, can be seen in this context. In the field of the preservation of environment, the traditional way of flood control, such as modifying riverbank, can be the alternative to the dam construction.

In Europe, the European Union has started the initiative of utilizing endogenous techniques for local development. The 'LEADER initiatives' which was introduced in 1991 based on the assertion that the recuperation of the equilibrium of the activities and the conservation of an interwoven and sufficiently diversified socio-economic structure needs a clear endogenous and local focus that is founded on the capacity for action and technical knowledge (Remmers, 1996: 9).

Environmental sustainability

The environmental condition of an area differs from place to place. Often, the discussion on the environmental preservation is to find the universal or standard way which can apply everywhere in the world, but it is now clear that this approach has limited application. The community with the knowledge about their own area should play certain roles and the development system has to be changed to let them be involved in the decision making process.

Whilst both Dag Hammarskjold Foundation and Tsurumi merely mentioned this feature, Miyamoto puts particular emphasis on this particular feature in his theory of endogenous development. Nakamura contends that preservation of the environment is not merely a matter of consideration, but the purpose of the development itself. Development is a concept in which quality of the economy matters and inevitably the preservation of the sound environment is required. In this sense, environmental sustainability is an aspect of endogenous development.

FINDINGS

From the Literature Review and former researches on endogenous development in Japan (Ong, Takiguchi & Furuoka: 2002), there has been no explicit adoption of an alternative development model by Japan Incorporated to date despite the theory originating in Japan. However, Japan's environmental laws concern for sustainable development suggests that they are, to a certain extent, inherently endogenous in nature (Ong, Takiguchi & Fumitaka: 2002 (unpublished). However, the lack of formal channels to integrate the local community's views, opinions and interests into development projects, indicate that further improvements in the implementation of endogenous development processes, are necessary. (Ong, Takiguchi & Fumitaka: 2002 (unpublished). The adoption of the Endogenous Development Model necessitates that Japan Incorporated policy-makers are informed of this alternative development model and made to realize that Japan must transform its centralized "top-down" development approach into one that is "community-based development" and "community supported development"

as propounded in the Endogenous Development Theory. This offers a little explored opportunity to utilize indigenous skills and wisdom in development projects for the public good.

CONCLUSION

When economic development fails to be conscious and respectful of, and harmonious with, an affected community's local characteristics, cultural heritage and traditions, such development will fail to benefit such communities. The nature and process of such economic development must therefore be called in question. Affected communities should not only be the basis of economic development but should also be involved in the development process and benefit from such development. The adoption of the Endogenous Development Model which emphasizes "community based" and community supported" development serves to achieve these legitimate socio-economic ends. The compelling relevance of the Endogenous Development Model to ASEAN 10 plus 3's emerging economies where state developmentalism dominates, is self-evident. Japan Incorporated's insustainable development experience and the need for economic policy integration before there can be regional economic integration, clearly points to the future direction for economic development which other members of ASEAN 10 plus 3 must take. Further, with corporate social responsibility and responsible governance concerns recently sweeping the region, it is submitted that TNT's commitment to endogenous development, would be consonant with the international trend towards internal corporate social and environmental audits. Finally, the ability to work together (*kyosei*) and the need for harmony (*wa*) must begin from within one's own borders and with one's own communities, before it can also be practised with a regional community of nations described as having little in common but a regional economic agenda.

REFERENCES

Abe, Yasutaka and Takehisa Awaji (eds.) (1998), *Kankyo Ho (Environmental Laws) 2ⁿᵈ edition*, (Tokyo: Yuhikaku).
Dag Hammarskjold Foundation (1975), *What Now?,* (Uppsala: Dag Hammarskjold Foundation)
Igarashi, Takayoshi and Ogawa, Akio (1997), *Kokyo Jigyo Wo Dosuruka (How to cope with Public works),* (Tokyo: Iwanami Shoten, 1997). pp. 60-61
Kojima, Reeitsu, Yoshihiro Nomura, Shigeaki Fujisaki, Naoyuki Sakumoto (eds.), (March 1995) *Development And The Environment: The Experiences of Japan And Industrializing Asia*, Papers and Proceedings of the Conference held on 20-21 December 1993 in Tokyo, (Institute of Developing Economies, Tokyo, Japan).
Mason, Robert J. (1999), "Whither Japan's Environmental Movement? An Assessment of Problems and Prospects at the National Level", *Pacific Affairs,* Vol.72, No.2, pp.187-207.
Miyamoto, Ken-ichi (1989), *Kankyo Keizaigaku (Environmental Economics),* (Tokyo: Yuwanami Shoten).
Modak, Prasad and Asit K. Biswas (1999), *Conducting Environmental Impact Assessment for Developing Countries,* (Tokyo: United University Press).
Modak, Prasad and Biswas, Asit K. (1999), *Conducting Environmental Impact Assessment for Developing Countries* (Tokyo: United University Press, 1999).
Nakamura, Kojiro (1986), "Chihotoshi No Naihatsuteki Hattenron Wo Motomete (Look for the Endogenous Development in Rural City" in Shibata Tokue, *Niju-Isseiki Eno Daitoshi Zo (The Image of Japanese Big Cities in the 21ˢᵗ Century),* (Tokyo: Tokyo Daigaku Shuppan Kai).
Nakamura, Kojiro (2000), "Naihatsuteki Hattenron No Hatten Wo Motomete (Look for the Development of Theory of Endogenous Development", *Policy Science,* Vol.7, No.3, pp.139-161.
Nishikawa, Yoshiaki (2004), "Kaihatsu ni Okeru NGO – Naihatsuteki Hatten wo Unagasu Akuta toshiteno Yakuwari wo Kangaeru (NGOs in the development as the actors for facilitating endogenous development)", *APC Asia-Pacific Studies* vol. 13, p. 20.
Ong, Takiguchi & Furuoka (2002), *Democratisation Of Development Process In Japan: Endogenous Development, The Community And The Utilization of Indigenous Wisdom As The Basis Of Development*, Asia Pacific Economics And Business Conference : 2002, "The Impact of Global Competitive Environment On Asian Economics & Business."
Ong, Takiguchi & Furuoka (2002), *Environmental Policy & Law in Japan: Towards Endogenous Development, An Alternative Development Approach,* Chap. 9, Faculty of Economics & Business, University Malaysia Sarawak Journal, (unpublished).
Remmers, Gaston G.A. (1996), "Hitting A Moving Target: Endogenous Development in Marginal European Areas", *Gatekeeper Series,* No. 63, International Institute for Environment and Development.
Tsurumi, Kazuko (1976), "Kokusaikankei to Kindaika/Hattenron (International relations and the Theories of

Modernization / Development)" in Mushakoji Kinhide and Royama Michio (eds.), *Kokusaigaku (International Studies),* (Tokyo: University of Tokyo Press).

Tsurumi, Kazuko (1980), "Naihatsuteki Hattenron ni Mukete (Towards the Endogenous Development Theory)" in kawada Tadashi and Miwa Kimitada (eds.), *Gendai Kokusai Kankeiron (Modern International Relations Theory)*, (Tokyo: University of Tokyo Press).

Tsurumi, Kazuko (1989), "Naihatsuteki Hattenron No Keifu (the Descent of the Endogenous Development Theory)" in Kazuko Tsurumi and Kawada Tadashi (eds.), *Naihatsuteki Hattenron (the Endogenous Development Theory),* (Tokyo: University of Tokyo Press).

Is Marketing Relevant in Managing Higher Education Institutions?

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ABSTRACT

Marketing normally are associates with business organization rather than public organization or non-profit organizations. This is due to the perceptions of public and practice of business organizations that marketing play a significant role in driving the organization towards profitability. Moreover, the tools used by marketers especially advertisement are subject to criticism such as deceptive or untruthful, offensive and exploiting certain groups. However, many public organizations and non-profit organizations have failed to recognized that marketing can play a role in increasing customer satisfaction and help improving good image to the public. Thus, this paper will look at how marketing can play a significant role in higher institutions by contributing towards customer satisfaction, increase service quality and produce quality output. The paper will also discuss on the issues and challenges involve in managing higher education institutions.

INTRODUCTION

In the new economy today, organization face with many new challenges such as globalization and the advancement of information technology. This new challenges force the organization in a competitive environment situation whereby the issues of survival is the main concern of any organizations. The effect of the challenges led to organizations striving for a world-class organization to race against other organizations in order to survive in the highly competitive environment. Like many other organizations, higher education institutions (HEI) are not exceptional in facing the challenges. In order to sustain their existence and better perception by stakeholders and potential customers, many HEI are moving toward a world-class university. This is especially in the developing countries, since the institutions need to compete with a recognized world class establish university in developed countries. Thus, this paper will look into a market orientation and quality management perspectives in contributing towards a world-class university.

MARKETING IN NONBUSINESS ORGANIZATION

Marketing has been linked to a profit oriented organization rather than a non-profit organization. This is due to the perception of the people associating marketing with the selling concept rather than marketing concept. The selling concepts holds that consumers will not buy enough of the organization's products unless it undertakes an aggressive selling and promotion effort (Kotler, 2003). This is especially true as many organizations invest heavily on marketing communications such as advertising and personal selling to persuade prospect to buy their product. However, advertising has been subject to many ethical criticisms. Some of the criticisms pointed out includes advertising is untruthful and deceptive, manipulative and offensive (Shimp, 2000).

Although marketing is seen to be associated with business organization, many are concerns whether the concept can be applied to a non-business organization such as public universities. Kotler & Armstrong (2001) defined marketing as a social and managerial process whereby individuals and groups obtained what they need and want through creating and exchanging products and value with others. Looking at the definition, marketing should be seen as a broad concept that can be applied to a non-business organization. It is a process that determines the needs of the consumers by exchanging product and value that can satisfy them.

SOCIETAL MARKETING IN HIGHER EDUCATION INSTITUTIONS

Consumers can be categorized into four groups whereby any organizations need to serve them (Kotler & Levy, 1969). The first group is the clients who are the immediate consumers of the organization's product. The second group is the trustees or directors (stakeholders), they are those who have legal authority and responsibility for the organization, oversee the management and enjoy many benefits from the product. The third group is the active publics that take a specific interest in the organization. For example in a university setting, it can include alumni and foundations in this group. Finally, the fourth group is the general public, who are those people that

might develop attitudes toward the organization due to its conduct. Kotler and Levy (1969) suggest that marketing is the function of the organization, which can keep in constant touch with the organization's consumers, read their needs, and build a program of communications to express the organization's purpose. They argued that selling follows rather than precedes the organization's drive to create products to satisfy its consumers even though selling can influence the large parts of organizational marketing.

Today, the latest concept known as societal marketing concept emerge in marketing literature. The concept noted that an organization should determine the needs, wants, and interests of target markets and deliver the desired satisfactions more effectively and efficiently than do competitors in a way that maintains or improves the consumers' and society's well being (Kotler & Armstrong, 2001). Shapiro (1973) identified three major marketing tasks that a nonprofit manager needs to carry out. They are resource attraction, resource allocation and persuasion. Resource attraction involves the organization to find contributors. For example, in the HEI, the university raises part of their money from tuition and other student fees. Resource allocation determines the organization basic function or mission. For example, who are the clients of the organization and what it will provide them. Finally, the third task is persuasion, which involves persuading people to do something which the organization desires but which makes no direct contribution to the organization. For example student vote campaign, which contributes to the achievement of the goal of the organization by changing his or her attitude and behavior but the task does not contribute funds or any new clients to the university.

MARKET ORIENTATION IN HIGHER EDUCATION INSTITUTIONS

Due to the increase in competitive pressure and the need to respond efficiently to customer needs, there has been a call for organizations to adopt market-oriented practices. The term market orientation is also known as the implementation of the marketing concept. Market orientation is the organizational culture that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers and thus continuos superior performance for the business (Narver & Slater, 1990). They suggest that market orientation is comprised of three behavioral components (customer orientation, competitor orientation and interfunctional coordination) and two decision criteria (long-term focus and profitability). Other definition of market orientation that has been used widely in the literature developed by Kohli & Jaworski (1990):

"Market orientation is the organization wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization wide responsiveness to it".

Three main activities underlying this definition are generation of market intelligence, dissemination of intelligence, and responsiveness to market intelligence. Instead of the philosophical statement in the marketing concept, these three sets of activities represent the operationalization of a market orientation (Diamantopoulous and Hart, 1993).

There have been many studies on the effect of market orientation on organizational performance. Many studies in various countries (Narver & Slater, 1990; Wolfgang, 1996; Pitt, Caruana & Berthon, 1996; Pulendran, Speed & Widing II, 2000; Sin & Tse, 2003) supported that market orientation has a positive relationship on organizational performance.

Generally, every organization has two broad marketing goals. First, is to satisfy customer needs. Second, is to provide an offering superior to those of their competitors. To achieve those two goals, Judd (2003) suggested that organizations to develop a customer oriented approach. This is based on the customer-orientation philosophy that success will come to the organization which best determines the perceptions, needs, and wants of target markets and satisfies them through design, communication, pricing, and delivery of appropriate and competitively viable offerings (Kotler & Andreasen, 1996). Organizations that employed customer-oriented approach will be perceived by customers to provide value in their offerings.

Today, in the higher education, besides the private colleges, more universities are being corporatised. In this situation, they need to find out their own fund rather relying heavily on public fund or the governments. In order to subsidized the budget besides doing many types of business, the university need to attract students especially the postgraduates' course. The postgraduate course tuition fees such as MBA and DBA are among the highest fees charged to the student. Most of the students doing this course are working, thus they have no difficulties in paying the fees. However, the university needs to know what are the attributes that influence potential students entering into higher education institutions.

A customer-oriented institution will find out more on the needs and wants of their potential students and satisfy them by providing value in their offerings. Moogan, Baron & Bainbridge (2001) link three criteria's that

influent students making decisions to enter a HEI. They are course specific (content, structure, method of assessment of the degree programmed), location (distance from home, rural/urban place, atmosphere of the campus, facilities of the city/town of the university) and reputation of the institutions (rankings, recognized name or department). Their findings indicate that at stage 1 (before the attendance of university open days), course content was the most important attribute to enter a HEI. At stage 2 (after the attendance of university open days, location appears the most important attribute in influencing them making decisions entering HEI. Beard (1992) also found up that personal recommendation by someone who had done the course could play an important role for students to become aware of MBA course. Table 1 below shows details of how students became aware of MBA courses.

Table 1. How students became aware of MBA courses

How found out about MBA attended	Full time (%)	Part-time (%)
Personal recommendation by:		
Someone who had done course	23	26
Someone from another school	15	8
Someone else	14	8
Enquiring direct	27	27
Through company worked for:		
Management development department	4	14
Own boss	2	5
Colleague/mentor	5	7
Company sponsoring MBAS	1	2
MBA directory	19	6
Press/media		
Advertisement	6	15
Article	15	5
Other answers	42	21

Source: Beard (1992). The MBA experience

The above discussion suggests that a market-oriented approach can be applied to a HEI. For example, a HEI can generate information on what are the needs of the prospects, disseminates the information across departments and coordinate with relevant departments to provide value in their offerings.

SERVICE QUALITY

Many studies found up that perceptions of service quality is the result from comparing expectations prior to receiving the service, and their actual experience of the service. If the perception of service quality is below the expectation, consumers will not satisfy. On the other hand, if the perception of service quality is above the expectation, consumers' will satisfied. Therefore, it is important for an organization to have some understanding on how the expectation develops. Zeithaml & Bitner (2000) identified four factors that may have influence on the desired service and predicted service expectations. These are:

➢ Explicit service promises - personal and nonpersonal statements about the service made by the organizations to customers
➢ Implicit service promises - service-related cues other than explicit promises that lead to inferences about what the service should and will be like
➢ Word-of-mouth communication - personal and nonpersonal statements made by parties other than the organization convey to customers what the service will be like.
➢ Past experience - customer's previous exposure to service.

Parasuraman, Zeithaml and Berry (1988) develop five general dimensions that influence customer assessments of service quality:

• " Reliability - The ability to perform the promised service dependably and accurately.
• Tangibles - The appearance of physical facilities, equipment, personnel, and communication materials.
• Responsiveness - The willingness to help customers and to provide prompt service.
• Assurance - The knowledge and courtesy of employees and their ability to convey trust and confidence.
• Empathy - The provision of caring, individualized attention to customers. "

These service quality dimensions can be generalized across many service organizations and prove to be useful to measure the gap between customer expectations and organization performance.

In the higher education context, the university can influence consumer expectations through word-of-mouth expectations by using existing students to shape the expectations of prospective undergraduates and make them as realistic as possible on occasions such as school visits and university open days (Hill, 1995). In addition, the university can use the external communication channel such as university prospectuses, faculty brochures, department information leaflet and many others to provide some information on what to expect studying and living in the campus environment.

ISSUES AND CHALLENGES

The discussion above implies that marketing concept is appropriate in managing higher education institutions. However, in pursuing market orientations, there are several issues that the university faced that may hinder them from implementing the activities.

CUSTOMER IN THE UNIVERSITY SETTING

One of the questions normally arise in a university setting is who are the customers in HEI. Is it students, industry, parents or stakeholders? Identifying customers is important to determine whom the institution needs to serve. Difficulties arise when there are many views on who should be the customer in the institution. For example, Weaver (1976) identified four parties as potential customers that are the government, its administrators, teachers, academics and the actual consumers (the learners, their families, employers and society as a whole). On the other hand, Newbould (1982) emphasize that the student as the customer and the course/programme as the product. Other views that customer can be categorized into primary customer, secondary and tertiary customer. For instance, Universiti Utara Malaysia (UUM) in their ISO 9001 quality management system manual distinguish its customers into primary customers and secondary customers. There are two categories of primary customer. The first is the Education Ministry, which are responsible on the education policies and other related regulations need to be followed by all government based university. The second primary customer is the job market that might have certain influence on the provision of teaching and learning by UUM. Secondary customer are the students whereby specific departments such as Student Affairs Department and Health Centre need to take into consideration as service provider to the students

The different views on whether students as customer or product show the complexity of defining customer in a higher education. Students can be a product of the university and at the same time be the customer in a university. As highlighted by Conway, Mackay & Yorke (1994):

"Students are its clients and its product: it provides a service to them in the provision of high quality teaching on courses which are satisfying to them personally, and which provides them with rewarding employment possibilities."

On the other hand, the market, parents and the stakeholders can also be considered as customer due to their interest in the institution.

THE ISSUE OF COMMUNITY DEVELOPMENT

Another issue that need to be highlighted is how far the university has contributes to the community surrounding them. What have the people in the community gains from the establishment of the institution in their area? Many people perceive the universities are working for the benefit of themselves and the needs of globalization but ignore the needs and existence of their own communities. However, question arises how the knowledge and research made by the university can be transferred or applied to solving the variety of problems faced by the community.

EMPLOYEE INVOLVEMENT AND COMMITMENT

Employees in the university, which includes administration and academic staff has an important role to play in projecting good image to the university. The personal interactions between academics and student and administrator and student are crucial in regard to perceived service performance. For example student dealings with administrator in student affairs department or academic affairs department may influence their perception

of service performance of the university. Similarly, if student find difficulties to consult lecturers or lecturers who fail to turn up to classes without good reasons, or who persistently arrive late, are unlikely to project good image to the service quality of the university. The negative experience encounter by students may influence prospective students through word of mouth communication. Thus, it is important to involve employees in problem solving and decision making so that this may increase their commitment to project good image to the university.

CONCLUSION

The above discussion attempted to examine the extent of marketing relevance to the higher education institutions. It seems that some of the concepts in marketing could have relevance to the institutions but with some modifications or adaptation that may be required. However, in the journey for a higher learning institution to face the challenges of globalization to become a world-class university, there are many issues that need to be taken into consideration by the management of the university.

REFERENCES

Beard, P.R.J. (1992). The MBA Experience: The Reality behind the myth. *The Association of MBAs*, London.

Conway, T., Mackay, S. and Yorke, D. (1994). Strategic planning in higher education: Who are the customers? International Journal of Education Management, Vol. 8, No. 6, p29-36

Diamantopoulous, A and Hart, S. (1993). Linking market orientation and company performance: preliminary evidence on Kohli and Jaworski's framework. *Journal of Strategic Marketing*, 1, p 93-121.

Hill, F.M (1995). Managing service quality in higher education: the role of the student as primary consumer. *Quality Assurance in Education*, Vol. 3, No.3, p10-21.

Judd, V.C. (2003). Achieving a customer orientation using "people-power," the "5th P". *European Journal of Marketing*, Vol. 37, No.10, p1301-1313.

Kohli, A.K. and Jaworski, B.J. (1990). Market orientation: the construct, research propositions, and managerial implications. *Journal of Marketing*, Vol. 35, April, pp. 1-18.

Kotler, P and Andreasen, A.R. (1996), Strategic Marketing for Nonprofit Organization, 5th ed.. New-Jersey: Prentice-Hall.

Kotler, P and Levy, S.J. (1969). Broadening the concept of marketing. *Journal of Marketing*, Vol. 33, pp 10-15

Kotler, P. & Armstrong, G. (2001). *Principles of marketing* (9th ed.). New Jersey: Prentice-Hall

Kotler, P. (2003). *Marketing Management (11th ed.).* New Jersey: Prentice Hall.

Moogan, Y.J. (2001). Timings and trade-offs in the marketing of higher education courses: a conjoint approach. *Marketing Intelligence & Planning*, 19/3, p179-187

Narver, J.C. and Slater, S.F. (1990). The effect of a market orientation on business philosophy. *Journal of Marketing*, Vol. 54, October, p20-35.

Newbould, G.D. (1982). Product portfolio diagnosis for U.S. universities in Kotler, P., Ferrel, O.C. and Lamb, C., *Cases and Readings for Non-profit organizations*. New Jersey: Prentice-Hall

Parasuraman, A,; Zeithaml, V.A.and Berry, L.L (1988). SERVQUAL: A Multi Item Scale for Measuring Consumer Perception of Service Quality, *Journal of Retailing*, 64 (Spring), p. 12-40.

Pitt, L., Caruana, A. and Berthon, P.R. (1996). Market orientation and business performance: some European evidences. *International Marketing Review*, Vol. 13, no. 1, pp. 5-18.

Pulendran, S., Speed, R. and Widing II, R,E. (2000). The antecedents and consequences of market orientation in Australia. *Australian Journal of Management*, Vol.25, No. 2, p119-143.

Shapiro, B.P. (1973). Marketing for nonprofit organizations. *Harvard Business Review*: September-October.

Shimp, T.A. (2000). *Advertising promotion: Supplemental aspects of integrated marketing communications (5th ed.).* Orlando: The Dryden Press

Sin, L.Y.M. and Tse, A.C.B. (2003). Market orientation and business performance: A comparative study of firms in mainland China and Hong Kong, *European Journal of Marketing*, Vol. 37, No.5/6, pp. 910-936.

Weaver, T. (1976). What is the good of higher education?. Higher Education Review, Vol. 8, No.3, p3-14

Wolfgang, F. (1996). Market orientation and corporate success: Findings from Germany, *European Journal of Marketing*, Vol. 30, 8, pp. 59

Zeithaml, V.A. and bitner, M.J. (2000). *Services Marketing: Integrating customer focus across the firm (2nd ed.).* Boston: McGraw-Hill.

Human Capital and Economic Development

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ABSTRACT

The commodity exchange between industrialized and developing countries refers to the knowledge exchange between them. In the light of the theory of comparative advantage, rich countries specializing in manufacturing knowledge and poor countries specializing in non-manufacturing knowledge. If poorer countries pursue to specialize in non- manufacturing knowledge, it is impossible to extricate themselves from poor countries. The role of the state is to create the adequate conditions for the development of human capital for the sake of future returns, especially, in developing countries. Fried-rich List has recognized the importance of human capital more than 150 years ago. It is imperative to train large numbers of workers skilled in using the modern technology of the modern industries in developing countries.   Economic development involves the knowledge process. Tacit and codified knowledge is argued, and it is discussed that tacit knowledge is one of the importance in skill formation. In Japan and East Asia NIES, education and the productive system are closely connected to each other to develop the economy. In contrast, in the Western countries, education and training have traditionally been treated in isolation from trade and industrial policy, with the exception of Germany, even if such a policy exists. Thus, developing countries should follow Japan in terms of education if they were succeeded in economic development.

INTRODUCTION

Knowledge, Information, and Human Capital

For advanced countries to be actively involved at work in the world economy, knowledge is becoming the most important factor determining peoples' living standard more than land, machines, utensils, and labour (World Development Report 1998/99, Chapter 1). In socio-economic systems, there two types of knowledge known as explicit and tacit knowledge. Explicit knowledge when relating to acquire skills, is referring to readily modifiable and transferable in the form of information that can be passed on to others, and in contrast, tacit knowledge can be not be readily codified in the form of information that can be passed on to others (Hodgson, 1988,p.6).   Tacit knowledge is a necessary foundation to all knowledge. Polanyi (1966, 1983) forcibly maintained that tacit knowledge is essential for all human activity, including science (p.19).   It was noted that all scientific advances and technological innovations are bound up with tacit knowledge. They rely on accumulated skills and habits, implanted in individuals and institutions (Polanyi, 1966, 1983). Thus, tacit knowledge forms the indissoluble core of all skills (Hodgson, 1999, p.48).

On the other hand, learning involves imitation and repetition, the acquisition of both personal experience and objective knowledge (Penrose, 1959,1980, p.53). In each technology, there are elements, which cannot be entirely diffused either in the form of public, or proprietary information (Giovannni Dosi, 1988, p.1131).

WHERE DOES TACIT KNOWLEDGE COME FROM?

Originally, tacit knowledge comes from habits, customs, routines, and norms. Tacit knowledge is accumulated and embedded in family, community, company, school, hospital, government agency, troops, network, customary groups, professional groups and others. It may be impossible to Asses how tacit knowledge contributed economic growth. Notwithstanding, there exists a dialectical relationship between explicit and tacit knowledge,especially, explicit or codified knowledge is normally a public good. Accordingly, rewards, which are acquired from producing knowledge, are less than their level acquired in the market. This makes private sectors loosing their incentive to generate knowledge. Generally, government has been providing private sectors with incentives for funding as well as it protect intellectual property rights such as patent and copyright.

As investors act with a view to securing individual returns, they do not make investments needed as a social whole from the social point of view in generating knowledge. Many government sectors have provided and are supplying financial assistance with private sectors in order to fill up a large gap between individual and social rewards.

Economic development is essentially a knowledge process, but we are still very much obsessed by mechanical models, capital-income ratios, and even input-output tables, to the neglect of the study of the learning process, which is the real key to development (Boulding, 1966, p.6). This is as accordanc with Boulding's remark. Contrastingly, T.W. Shrultz gave an argument on knowledge and learning processes in economic development using the concept of human capital. This is an operational and convenient concept, but again, this is an abuse of the concept of 'capital'. Besides, Schumpeter defined exactly that capital came to denote the sums of money or their equivalents brought by partners into a partnership or company, the sum total of a firm's assets and the like. Thus the concept was essentially referring to monetary either in terms of actual money or claims to money, or some goods evaluated in money (Schumpeter, 1967, p.323). The word 'capital' is properly confined to the notion of the money value of an owned stock of assets that exist in, or are readily convertible into, a monetary form(Hodgson, 1999, p.286)**.** Nonetheless, the word 'human capital' is used, following its conventional usage.

Human capital is defined as the stock of skills and productive knowledge embodied in people. The yield or return on human capital investment lies in enhancing a person's skills and earning power, and in increasing the efficiency of economic decision-making both within and without the market economy (The New Palgrave,1987, p.682).According to the theory of human capital, education investment is continued until return on education investment equals return on other ordinary investment. Therefore, following this theory, if persons expect it is unprofitable to go to university, they would not go to university. For example, in Japan everyone is liable to go to university, even if they do not have expectations. It is, as a pecuniary matter, far more profitable to their children if parents were to have their money trusted with an investment company rather than make their sons and daughters enter into university. However, this theory did not apply in the condition of the pre second world war as well as the post-second world in Japan.

Dore (1976, 1997, p.72) offers three propositions on the late-development effect. The later the point in world history that a country starts on a modernization on the following grounds.
- The more widely education certification are for occupational selection,
- The faster the rate of qualification inflation,
- The more examination-oriented schooling becomes at the expense of genuine education.

If it is the fact that people go to school for certificate purposes, then it is the need for and desire for certificates rather than knowledge which explains the popular demand for schooling, it will result in the schooling process itself resolve around certification. Once that process begins, it has the inbuilt mechanisms that makes it self-reinforcing. The more consciously children are sent to school to get certificates, or sticking to the syllabus, they would more concentrate on learning to remember rather than to understand .(Dore,1997, pp.80-81). In view of that, it is obvious that we should draw a line of demarcation between genuine education and ' education ' for certification. However, it is easy to say than practice as it is natural that ordinary people need knowledge to get their certificates in order to form their career. However, this does not learn knowledge from pure intellectual curiosity and for a good national and international society, but is apt to make them concentrate than just to acquire knowledge for certificate purposes in order to get their jobs. Human capital theory will promote ' education for certificate'. But, getting the certificate itself in UK is said to rely on problem solving not just knowledge acquisition. If so, no problem is seen as   regarded to the certificate.

Knowledge is information plus judge

Learning is the process of problem formation and solution rather than the acquisition and accumulation of information. With the questioning of how strategic the role of physical capital is, more weight has been given to human capital to create agents who can become more productive through their acquisition of knowledge, better health and nutrition, and increased skills (Meier, and Stiglitz, eds. 2001,p. 19). Alfred Marshall said, "Capital consists in a great part of knowledge and organization.   Knowledge is our most powerful engine of production. Organization aids knowledge. It seems best sometimes to reckon organization apart as a distinct agent of production "(Marshall, p. 115). Adam Smith argued that the difference of natural talents in different men is, in reality, much less than we are aware of; and the very different genius, which appears to distinguish men of different professions, when grown up to maturity, is not upon many occasions so much the cause, as the effect of the division of labor. The difference between the most dissimilar characters, between a philosopher and a common street porter, for example, seems to arise not so much from nature, as from habits, customs, and education (Smith, 1961, pp.19-20). He continued that the work, which he learns to perform, it must be expected, over and above the usual wages of common labor, will replace to him the whole expense of his education, with the ordinary profits of an equally valuable capital. It must be done in a reasonable time; regard being had to the very uncertain duration of human life, in the same manner as to the more certain duration of the machine (pp. 113-114).

According to Boulding (1966, p.6), Smith saw very clearly that the learning process was the key to development, for if we examine his causes of the increase in the productive powers of labor (economic development), they all involve the knowledge process. He also mentioned that Smith had perceived the enormous importance of what today we call research and development in the process by which every body gets richer (p.7). On the other hand, J.S. Mill addressed the skill and knowledge therein existing as one element which determines productiveness of the labor of a community: whether it be the skill and knowledge of the labors themselves, or of those who direct their labor. Thus, the productiveness of the labor of a people is limited by their knowledge of the arts of life is self-evident (Mill, 1965,p.106).

In fact, there are two types of knowledge indispensable to developing countries: technological knowledge and specific knowledge. There are also knowledge gaps between nations and within a nation. It is not easier for developing countries to fill up its gap as high-income countries incessantly keep creating new frontiers of knowledge. Developing countries acquire knowledge existent in the other region of the world through open trade regime, direct investment from foreign countries, licensed contract and apply it to them. Nevertheless, here

is its justification for government to intervene instead of filling the gap through markets such as below:

- Encouraging lifetime education
- Establishing sound environment
- Providing qualification authentication
- Ability certification
- Supplying employers with any information as to level of education and abilities workers have.

HUMAN CAPITALS AND ITS RATE OF RETURN

Endogenous theory explained human capital as the driving force of economic growth.There are many types in human capital. Education is a major type of human capital. 'On the job-training' in factory and workplace, and R&D are another major type. Human capital is known to have positive externality. For example, if a worker in factory raises his skill, another worker in the same factory learns something valuable from him, and will increase his productivity. This impact continues to bring a 'spill-over effect' to other workers. As a matter of fact, the literacy rate around the time of the Meiji Revolution in Japan was high. Some 50% of men and 10% of women in Japan by then had received some formal education. Almost all Samurai could read and write and many merchants and farmers could too. It is estimated that the illiteracy rate around the time of the Meiji Revolution stood at about 50% in the case of men (about the same as in Italy) and 85% in women (again about the same as in Italy) (Toyota, 1981, p. 45). Dore (1963) poses the hypothesis that the development of school education in the Tokugawa period was linked to this and stated, "It is that the diffusion rate of reading and writing in 1870 was considerably higher in Japan than in other developing countries in 1870." Perhaps the education system in Japan at that time was no worse than in some European countries. It is evident that, according to an investigation conducted by a special committee of the British Parliament, in Britain the percentage of school attendance was just one child in four or five in major industrial urban areas (Dore, 1965, p. 291). The illiteracy rate in Italy and France corroborates the above remark. The question is "What can the diffusion of literacy bring to developing countries? (Myrdal &King,1971)" It can ben explained in the following paragraphs.

It becomes easier for people who have experienced systematic and conscious learning to respond to progress. Whatever the environment, be it the Army, a factory or agricultural co-operative, communication by written instruction enables the establishment of national training standards. While people are younger, they are more able to clear the first hurdle in their mental training, opportunities to allocate efficiently the nation's intellectual resources are increased and individuals increase opportunity to realize their talents. In addition to that, the higher the literacy rate is, the more efficient the administration and bureaucracy, such as land and family registration systems, become. It is also useful for the establishment of local governments and cooperatives though people can learn through imitation, learning from written instructions is more effective and accurate. People who can read blueprints and factory manuals can become more effective workers than those who cannot. Farmers who are able to read pamphlets and perform simple arithmetic are more likely to be progressive in their approach to farming. Thus, the above statements show the significance of the diffusion of literacy for economic development and are abstracted from the experiences of Japan and other countries. There is a very positive correlation between illiteracy and the level of economic development. Nevertheless, Myrdal and King (1971) maintain that, even if we research the relationship between literacy rates and level of economic development, we cannot derive trustworthy data on the role of literacy in development. Notwithstanding the fact that a close correlation between literacy and development is observable, it is not evident which is the causal factor (p. 390).

Human capital investments enhance individual productivity, and increase individual earnings, which can acquire their future income. Accordingly, the optimal level of human capital is determined at a point where marginal cost for human capital investments equals their marginal benefit. However, if the determination of the optimal level for human capital is left to markets alone, it is below the social optimal level. In the absence of any government intervention, its private return falls below its social return, because of a market failure of human capital. In other word, because of the existence of externality, marginal productivity of private human investment is smaller than marginal productivity of social human capital, and thereby private human capital is invested less than social human capital. Social return (benefit) on university education is the sum of private return (benefit) ascribed to individual and social return belonging to a whole society. If university education has any or large externality, social return on it is larger than private return on it. Differences between individual abilities to acquire their skills and technology can generate differences of their productivity.

How much is the rate of return on human capital?

Oshio (2002, pp.48-49) summarize on social and private rate of returns on education as follows. The rate of return on education is higher in developing countries than developed countries, while the rate of return on university education investment is nearly 6 percent in Japan. The private rate of returns on higher education investment is the lowest among other developed countries. In the case of developing countries, the rate of returns shows a decreasing trend as primary education proceeds to secondary, and then higher education. In comparison with the private rate of return, the social rate of returns decreases in both developed and developing countries.

Productivity-raising effects of education and even people's interest in acquiring education will depend on the extent to which institutional reforms take place. Such reforms can come about only through legislative and administrative means, and they require many additional policy measures to make them effective. An analysis which does not fully take into account the institutional framework within which the economic variable operateis bound to be not only superficial but misleading (Myrdal & King, 1972, p.362).

List' Theory on Mental Capital

Friedrich List (1789-1846) is well known as a great protectionist along Alexander Hamilton (1775-1804, the first secretary of the Department of the Treasury in US) in the history of economics. Besides, he has been recognized as a great thinker who presented the idea of a European Union more than 150 years ago (Rousgakis, 1968). His analysis of the state's economic role is still valid for our economic analysis and social sciences, despite our often mentioning to government's failures. List used the concept of national productive powers as his argument for economic development. It consist of three types of capital: natural capital, mental capital, and material capital. The capital of nature comprises land, sea, rivers and mineral resources while the capital of mind (mental capital) includes skills, training, industry, enterprise, armies and naval power and government. The capital of mind is equivalent to Shultz and Becker's human capital in the sense that it encompasses skills, training, and enterprise. The capital of productive matter (material capital) composes all objects such as machines, utensils and raw materials, that are used directly or indirectly in the production process. It is not true to conclude that the productive power of a nation is restricted by its capital of matter. The greater part of the productive power consists in the intellectual and social conditions of the individuals, which List calls capital of mind (List,1827,p.192).

On the other hand, natural and material capital are inferior to mental capital.Economic policy making that is aimed at the development of mental capital, all other things being equal, will result in better performances than economic policy that aims to enlarge the development of natural and material capital (Levi-Faur, 1997, pp.157-58).In order to clarify this point, List offered the example of two families, each with a landed proprietor(List, 1885, pp.138-39).Each of them saves yearly 1,000 thalers and has five sons. The one put out his savings at interest, and keeps his sons at common hard work, while the other employs his savings in educating two of his sons as skilful and intelligent landowners, and in enabling the other three to learn a trade after their respective tastes. The former acts according to the theory of values, the latter according to the theory of productive powers. The first case at his death may prove much richer than the second in mere exchangeable value, but it is quite otherwise as regards productive powers. The estate of the latter is divided into two parts, and every part will by the aid of improved management, yield as much total produce as the whole did before. While the remaining three sons have by they're talents obtained abundant means of maintenance.The landed proprietor of the former will be divided into five parts, and every part will be worked in as bad a manner as the whole was heretofore. In the latter family a mass of different mental forces and talents is awakened and cultivated, which will increase from generation to generation, and so every succeeding generation possesses more power of obtaining material wealth than the preceding one, while in the former family stupidity and poverty must increase with the diminution of the shares in the landed property.

All expenditure in the instruction of youth, the promotion of justice, defense of nations and the like is a consumption of present values for the behoove of the productive powers. The greatest portion of the consumption of a nation is used for the education of the future generation, for promotion and nourishment of the future national productive powers. However, it is not evident how List thought on education separated from the productive system. The bilateral exchange of the two countries is not only the exchange of material capital, but also the exchange of mental capital (human capital). Manufacturing involves many domains of knowledge, science, and technology, and presupposes much experiences, skills and practice. It is found that latecomer countries normally are inferior to advanced countries on manufacturing knowledge. The bilateral exchange of developing and industrialized countries mean the exchange between the exchange non-manufacturing and manufacturing knowledge, and developing countries specialize in non-manufacturing knowledge and industrial countries specialize in manufacturing knowledge, in the light of the theory of comparative advantage.

To List, the role of the state, in such a case, was to create the adequate conditions for the development of mental capital. To do so, policy makers should take long-term considerations into account and current sacrifice of exchange value should be implemented for the sake of future returns.

SKILL FORMATION: EXPERIENCE DIFFERENCES BETWEEN THE WEST AND NORTHEAST ASIA

The international competitiveness of the modern economy relies heavily on the following factors.
(a) The government's industrial policy[1].
(b) Levels of technology and workers' skills.
(c) Managerial capabilities.
(d) The cost of raw materials and manufactured products.
(e) The national ethos and institution.
Where the cost of raw materials and manufactured products depends on levels of capital accumulation and

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[1] Ono (2002) on industrial policy. in Northeast Asian countries.

interest, the technical superiority and construction costs of plant and equipment, and the skills and technical capabilities of the labor force. Japan's capital accumulation and capital equipment in the early Meiji period were meager in comparison with the developed countries of Europe and North America, meaning that, comparatively; its interest burden was greater. Besides this, the costs of shipping capital equipment from abroad, the expense of hiring foreign technicians, and of paying the traveling expense, and the need for reserves and parts to insure against the breakdown of machinery that Japan herself could not manufacture, meant that it was necessary to bear extremely high costs for the construction of capital equipment (Takahashi, 1973, p.119).Accordingly, in the first part of the Meiji era (1868- 1912), regardless of factors (c), (a) and (e) above, it can safely be said that Japan's international competitiveness was failing as a result of factor (d). Thus, there was no other option for Japan but to achieve international competitiveness by improving her human capital. The following were the labor prerequisites for the modernization of the mining and manufacturing industry:

(a). Low waged labor.

(b). Toleration of long working hours.

(c). An industrious workforce maintaining labor quality and quantity over a fixed time.

(d). A workforce with skills adapted to modern industry.

(e). An abundant supply of labor.

However, in any event, an extreme shortage of workers skilled in modern techniques in Japan in the Meiji period meant that it was imperative to train large numbers of workers to be proficient in using the technology of the modern mining and manufacturing industries.

THE CONTRIBUTIONS AND LIMITATIONS OF ENDOGENOUS GROWTH THEORY: WHY AND HOW INCREASED RETURNS OCCURRED?

The economic history so far was the process of increasing returns. Endogenous growth models ask why differences in the facts and rate of economic growth and well being persist over time in different countries. They posit that these differences and variations are attributable to differences in trade policies and human capital. The endogenous growth theory claims that economic growth changed from physical capital with decreasing returns to scale to its increasing returns as a result of internalization and investment of learning and knowledge, and externalities.

The new growth theory exhibits (Romer, 1986, p.1003) the followings:

a) Emphasis on human capital more than physical capital.

b) Recognition of the benefits from the international exchange of ideas that accompanies an open economy integrated into the world economy.

c) Convergence occurs as the "technology gap" between countries is overcome and poor countries catch up with rich countries.

d) Explains technical progress as being determined by the " accumulation of knowledge".

In view of the above, specialization, human capital and economic growth or development has been the research agenda for a number of economists. Lucas assigns a central role to his concept of the external effects of human capital. These effects spill over from one person to another, people at each skill level are more productive in high human capital environments, and human capital enhances the productivity of both labor and physical capital (Lucas, 1988).

A country's human capital is an important economic fact in analyzing the production possibilities of the country. The productivity value of this human capital "endowment" depends in large part on its composition. What matters in this context is the heterogeneity of human capital. The distinction between general human capital and firm-specific human capital of workers is useful. The concept of specialized human capital encompasses a large number of forms of human capital that pertain to increasing returns events (Schulz, 1993, p.27). Although Schultz claimed that a country's human capital at any given data is an important fact, he does not continue his analysis to how a country's human capital at any given data is formed. In Adam Smith's theory of growth, the division of labor (specialization) was the source of increasing returns. Smith's theorem that the division of labor depends on the extent of the market is widely known[②]. The division of labor holds the key to specialization, and to investment in specialized human capital. Classical political economy was a theory of how an economy develops through time. There was no theory of resource allocation. Because of an absence of interest in resource allocation per se, the classical economists paid little attention to the possible contradiction between the postulates of increasing returns, particularly, in non-agricultural industries and maximization of product value (Buchanan and Yoon, eds.1994, pp.5-6).

As the classical hypothesis that generalized increasing returns describe production processes in non-agricultural industries is not compatible with the neoclassical model, controversies between economists have taken place a few times to date. However, economists lost interest in the problem that emerges from the interstices or contradictions between the classical and neoclassical structures of analysis. Alfred Marshall was aware of this contradiction and argued as follows in his Principles of Economics. The economies arising from an increase in the scale of production of any kind of goods fell into external and internal economies. Those are dependent on the general development of the industry, and on the resources of the individual houses of business engaged in it and the efficiency of their management (Book 4, Chapter 13 Conclusion. Correlation of the Tendencies to Increasing and to Decreasing Returns. p.262) Man's part in agriculture confirms to the law of increasing returns, in agriculture as well as in manufacture. But yet the economies of production on a large scale are not quite similar in the two cases (Book 6 Chapter 10 p.541). On the other hand, nature in production shows a tendency to diminishing return; the part, which man plays, shows a tendency to increasing returns. The law of increasing return may be worded thus: An increase of labor and capital leads generally to improved organization, which increases the efficiency of the work of labor and capital (Book 4 Chapter p.265). The distinction between public and private property in knowledge and organization is of great and growing importance: in some respects of more importance than that between public and private in material things (p. 115).

After the Second World War, Paul Samuelson's Foundation of Economic Analysis and especially the maximization of analysis in the Arrow-Debreu work in the 1950s, led microeconomic theorists to pay attention almost exclusively to general equilibrium analysis that incorporated universalized constant returns to scale as a necessary postulate required to derive the formal existence proofs (Buchanan and Yoon, eds.1994, p.8).

By the mid-1970s, the aridity and emptiness of highly formalized general equilibrium analysis came to be

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[②] Hicks (1969) says "It is before there is any market (or without any dependence upon a market) that we first meet a substantial opportunity for specialization and division of labour. There is indeed some specialization, as between sexes and age-groups, even in the most primitive tribe………The first development of skill is independent of the market. It does imply specialization, but it is a specialization (like that which occurs when a new process is introduced into a modern factory) that is directed from the top. Specialization is indeed a matter of the economies of scale (pp.22-23).

   K. Polanyi (1957) contends, "No less a thinker than Adam Smith suggested that the division of labour in society was dependent upon the existence of markets, or as he put it, upon man's 'propensity to barter, truck and exchange one thing for another'. This phrase was later to yield the concept of the Economic Man……Up to Adam Smith's time that propensity had hardly shown up on a considerable scale in the life of any observed community, and had remained, at best, a subordinate feature of economic life (pp.45-46).

widely acknowledged, even by those economists who had participated directly in the theoretical advances[3]. The thirst for relevance became real. A begrudging rediscovery of the issues of the 1920s and 1930s commenced. The return to increasing returns can find its most widely recognized application in the new theories of endogenous economic growth, primarily associated with the work of Paul Romer. He explicitly tied his work to Allyn Young's seminal work ('Increasing Returns and Economic Progress' in" Economic Journal", December 1928) on increasing returns to scale. Final output will increase more than proportionately due to the impetus given to the introduction of knowledge and human capital investment. Romer, Lucas and others are extremely fundamentalists on the role of the market in their beliefs. Nonetheless, it is very interesting that Romer and others deduced the significant role of the government on economic growth from the new endogenous growth theory. According to Romer and Lucas, all that government need to do to propel developing countries from a low growth trajectory to a high growth one is to invest in human capital and knowledge.

More recent underdevelopment theory, associated with the Chicago school has identified that low human capital endowments as the primary obstacles to the realization of the economies of scale inherent in the industrialization of developing countries. Expressing schematically, High (Low) levels of human capital and knowledge as high (low) degrees of economies of scale, high (low) factor productivity. high (low) growth rate. However, endogenous growth models do not seek answers and cannot answer as to why these trade policies and human capital differences in different countries occur, whether they are trade policies or human capital (Orru Biggart, and Hamilton, 1997). Lucas (1988) dismisses the possibility of identifying the social impulse for human capital acquisition with a statement that " We can no more directly measure the amount of human capital a society has, or the rate at which it is growing than we can measure the degree to which a society is imbued with the Protestant ethic."(p.35).

SKILL FORMATION: JAPAN AND THE EAST ASIA NIES

In Japan and the NIES, education and the productive system is closely connected to each other. In contrast, in the Western countries, education and training have traditionally been treated in isolation from any consideration of trade and industrial policy, with the exception of Germany, even if such a policy exists. The experience of skill formation and training system in Japan and the NIES raised important questions and issues for the older industrial countries. Accordingly, a debate, on whether or not both education and training policies will need to be driven by the goals of trade and industrial policy, took place (Ashton and Green, 1996, p.186). The education of Japan, Taiwan, and South Korea are said to have evolved a common model distinct from that prevailing in the West and this is thought to be a key aspect of Asian economic success (Cummings, 1995)[4].

Modern industrialization in East Asia occurred on the basis of learning and subsidy. East Asian industrial

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[3] Morishima (1992) started to have a query about a main line models developed by Arrow, Debreu, Hahn, Malinvaud, Patinkin and others, in spite of still regarding general equilibrium theory as the kernel of economics (pp.1-2).

It is said that in 1970s general equilibrium theorists such as Gerald Debreu (1974), Rolf Mantel(1974),and Hugo Sonnenschein(1972) reached quite strong and almost entirely negative conclusions about both the uniqueness and the stability of general equilibrium, these problems would eventually prove fatal for this research program, therefore, mainstream economists shifted its cutting edge from general equilibrium theory to game theory.

[4] Many specialists in the West are used to lumping Japan, South Korea, and Taiwan under a certain feature like P.W. Kuznets (1988) and Booth (1999). I think that we should include recent China into this group.

I am building *The Economics of Quasi-Markets* (1999, 2001 and others) which reflect the economic development experience of Northeast Asian countries by trial and error. *Quasi-Markets* are presupposed as a concept which is independent of value judgments, although it might solecistic. It may be a book like Simon Kuznets (1965) in which he has attempted such a work.

revolution has come about as a process of learning rather than of generation of inventions and innovations. Learning has been on a similar set of institutions (Amsden, 1989, p.4). The First Industrial Revolution of Britain was built on laissez-faire, the Second Industrial Revolution of Germany and America on infant industry protection. In late industrialization, the foundation is the subsidy----which includes both protection and financial incentives, as Gerschenkron(1962) conceived it, but an entrepreneur, using the subsidy to decide what, when, and how much to produce. The subsidy has also changed the process whereby relative price are determined (Amsden, 1989, pp.143-44). It could be also interpreted as the successful industrialization of Meiji Japan as a process of learning and subsidy rather than low wage. The spectacular economic growth of China could be attributable to learning and subsidy rather than workers' low wage, while the Chinese economy normally is argued to be competitive in the global market due to low wages and the researcher would like to categories China into Northeast Asia. The causes and characteristics of the rapid economic growth of North East Asia (Japan, South Korea, and Taiwan) are said to be different from those in the fast –growing countries of South East Asia, because of initial conditions of human and physical capital, and others (Booth, 1999,p.302). However, Northeastern and Southeastern Asia are similar to successful state intervention in the market, although there is a difference in the degree of intervention.

THE SKILL FORMATION OF JAPAN AND THE EAST ASIA NIES

Japan

During the feudal period, the Japanese had relied on an apprenticeship system which was similar to that emerged in feudal Europe, on the master-servant relationship, with the master providing accommodation but no pay and the apprentice acquiring the skills over a long period of time. (Ashton and Green,1996, pp. 148-49).

Following the Meiji Revolution (1868), the Meiji government built up compulsory elementary education for four years in 1886 and extended to six years in 1907. The Meiji government established the system of higher education to produce engineers for the private sector in order to meet the demand for scientific and professional personnel and provided technical education for foremen and technicians. After the Sino-Japanese War (1894-95), privately-owned heavy industry suddenly grew in influence, government-run industries also expanded rapidly, and competition for both government and private business to acquire skilled workers led to rapid turnover, making the mass training of skilled workers a matter of urgency for the government and the private sector. Moreover, in the modern heavy chemical industry, unlike in spinning, weaving and textile industries, the ability to maintain a large, top quality, skilled workforce was decisively important for enterprises. Expert craftsmen trained under the traditional system of apprenticeship since the Edo period (1603-1868) had been given on-the-job training under the guidance of foreign technical experts and had been instructed to master new technology. In such fields as printing, glass, surveying instruments, clocks, telegraphic instruments, ceramics and cigarettes, expert craftsmen was chosen for practical training abroad.

As it was impossible to train the modern skilled workers needed by large factories after the Sino-Japanese War, large factories introduced an apprentice system. Thus the training of skilled workers was developed into a factory apprentice system using worker training methods derived from traditional apprentice-type craftsmen's methods as well as modern apprentice systems. In 1880, an attempt to introduce craft training in the school was made, but was not accepted by employers. Employers preferred to reply on work-based apprenticeships for their supplies of skilled workers. They built on work-based apprenticeships with a system of continual in- house retaining of craftsmen (factory apprenticeship). The expansion of machine production signaled a trend of decline in the apprentice system, but it survived into the Meiji 30s (1897-1906). There were two kinds of apprentice at that time: those who were trained in the job in a factory under a specific worker's guidance, and those who were

tied in an apprenticeship to a specific worker before coming to the factory and were employed in attachment to him. From the end of Meiji to the beginning of the Taisho period (1912-1926), the recruitment of unskilled and semi-skilled workers was not a serious problem. However, top-quality skilled workers were in short supply, and accordingly such people came to be trained by the companies themselves. Entering the Showa era (1926-1989), the turnover of factory and mine workers took a downturn. This coincided with the formation of a lifetime employment system. From the end of Meiji to early in the Showa era, the practice of lifetime employment was actively and intentionally developed in large enterprises. In the heavy chemical industry key employees made up 20-30% of the total, and it was to this portion that lifetime employment was applied. The extension and reshaping of this to regular ordinary employees took place in the first half of the Showa 20s(1945-1945).

There were three reasons why the lifetime employment system began to take shape in the pre-war early Showa era. First is to acquire skills adapted to the development of technology. Secondly is to secure good quality labor since this was in short supply, and thirdly, is to cultivate loyalty towards the company in employees to counter frequent labor unrest.

After the Second World War, as a counter to the intensification of the labor movement, the third reason took precedence, so enterprises could rebuild the authority of management in the workplace (Tsuda, 1976, p.72). The prototype for the modern lifetime employment system took shape in the late Taisho-early Showa period, was further developed in the controlled economy of the Second World War (1941-1945), and re-formed and established in 1945-65 periods after the Second World War. The post-World War Two practice of lifetime employment was an extension of the employment practices established for key employees of large enterprises in the early Showa era.

8) The educational system becomes a route to higher status occupations (Sakamoto, 1977).

9) The state's attempt to enhance the skill level of the labor force was the establishment of the unique Japanese system of lifetime employment -based skill formation. The security of lifetime employment made possible to raise the incentives for training fellow workers and for sharing knowledge with peers and subordinates (see Koike and Inoki, eds.1990). After the Second World War, within the educational system, vocational education was integrated into mainstream education for age fifteen plus. Unlike the British schools, which sought to inculcate social skills, the Japanese schools sought to develop cognitive skills (Ashton and Green, 1996, p.148).

The East Asia NIES:

Singapore, Taiwan, South Korea and Hong Kong share many features in common, in terms of the relationship between the process of state formation, industrialization and skill formation (Ashton and Green, 1996,p.154). The East Asia NIES skill formation is thought to have modeled the Japanese skill formation in the effect that education was related to industrial policy[5]. However, it remains as a research agenda for the researcher.

INSTITUTIONS AND HUMAN CAPITAL

It is unlikely to develop the economy in cases either technology without skill or skill in the absence of technology as there is a dialectical relationship between skill and technology. A country's skill and technology, and its explicit and tacit knowledge are formed under a particular set of institutions. To understand the

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[5] See Ono (2002) on industrial policy in Northeast Asian countries and P.W.Kuznets (1988) on the labour market of Japan, Taiwan, and South Korea.

heterogeneous experience of countries in achieving development in the broad sense, it is necessary to appreciate more fully not only the governments' task but also the role of organizations and institutions. In addition, it is required to improve the educational institution of Japan and perhaps other East Asian countries, as they are more vulnerable to globalization shock, and weak at 'radical change'.

On top of that, the model of the neoclassical economic growth ideal is essentially institutionalisms. Neoclassical economics contends that the particular set of institutions in an economy does not matter. As North (1990, 1997) contended, cultural beliefs is a basic determinant of institutional structure. Not economics, but psychology, sociology, political science, anthropology, law and history experts must provide the answers regarding the origins of cultural beliefs, and how they lead to institutional change and the formation of social capital over time. Besides, interdisciplinary research is needed to understand the obstacles to change in the form of values and institutions.   A beginning is needed in this area of institutional economics[6]**.**

IMPLICATIONS FOR DEVELOPING COUNTRIES

The implications for developing countries starts with a question, "Can the human capital model of Japan and the East Asia NIES represent a model, which could become relevant for the needs of developing countries?" The ability of Northeast Asian countries to link education and training to continuous change in the development of the productive system provides a model which offers institutional flexibility and the possibility of catching up fast with the older industrial nations (Ashton and Green, 1996, p.188). The Northeast Asian human capital model suggests the need for a new trade and industrial policy, which should be, link to an effective national human resource development strategy. However, there are some limits to the applicability of this new model of human capital, because some of the developing countries are not yet in a position to generate the basic institutional prerequisites, such as an efficient and stable system of state administration and why   the Northeast Asian countries are able to possess a stable state administration.

CONCLUSION

Firstly, the commodity exchange between developing countries and industrialized countries exhibits the knowledge exchange between them. In the light of the theory of comparative advantage, industrialized countries specialize in manufacturing knowledge and developing countries specialize in non-manufacturing knowledge. According to List theory on mental capital, the role of the state is to create the adequate conditions for the development of mental capital (human capital) for the sake of future returns and is the theory of comparative advantage advantageous to developing countries? (See Chang, & Grabel, 2004, Chapter 7).

Secondly, what kind of knowledge should be developed in develop developing countries, fundamental or practical knowledge or both? If developing countries learn from the experience of skill formation in Japan and the East Asia NIES, education could link to industrial and trade policy for the sake of industrial development. Soon after developing countries caught up with developed countries by embracing the Japanese type of education, then they should converted to an education system in which education policy is independent of training policy. In 1980s when she attained her international productivity, which was able, to emulate Western

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[6] Chang (2002) is studying government, markets, central bank, democracy, bureaucracy, judiciary, property rights in development economics field on the basis of such an institutional economics framework.

developed countries, Japan should have transformed a system in isolation from the system linked to the productive system. Nowadays the Japanese government does not try to make any radical change in the Japanese education system as well as other important domains. In terms of education, East Asian countries should not follow Japan in case they succeeded in economic development. Japan failed in education as well as town planning after the Second World War. Genuine education exists for seeking knowledge, for intellectual curiosity and so on rather than getting just a certificate itself. People pursue various types of knowledge.

Thirdly, human capital is a necessary condition for economic development. Myrdal argues like this. Easterly (2001,Chapter 4) presents a skeptical view that education brought a number of developed countries a good performance in the economy. Is the relation between human capital and economic development the puzzle, which came first, the chicken or the egg?

Fourthly, nonetheless, we need any education and training for occupational selection. It is necessary for us to acquire a certification to secure a job in modern society. The theory of human capital has the two origins in its development. One is to understand the sources of economic growth; the other is the distribution of economic rewards.

Finally, "Investment in Man" should be mainly implemented by central or local government, while dismissing silly bureaucratic rigidities and diminishing weakness from bureaucracy, as the private sector in education is forced to put it on commercial basis and adopt any myopic policy and, although Chicago school claims that it is the best policy when a rational individual follows his or her rate of returns on education investment under free market environments in education industry. This does not ever mean to deny the private school in education. If the private school is able to avoid a myopic view, it will be better than public or state school. The private schools in UK have a broader education with much more problem solving, traditional subjects, and much more team, hobby out of school activities to produce the ' whole' individuals.

REFERENCES

Amsden,A.H. (1989) Asia's Next Giants, South Korea and Late Industrialization, New York, Oxford University Press.

Ashton, D and Green, F.(1996) Education, Training and the Global Economy, Cheltenham and Brookfield, Edward Elgar.

Booth, A. (1999) Initial Conditions and Miraculous Growth: Why is South East Asia. Different From Taiwan and South Korea?, World Development Vol.27,No.2.

Boulding, K.(19 66) The Economics of Knowledge and The Knowledge of Economics, American Economic Review (Papers and Proceedings),56

Buchanan J.M. & Yoon, Y.J. eds. (1994) The Return to Increasing Returns, Michigan, The University of Michigan Press.

Chang, H. J(2001) Kicking Away the Ladder: Developing Strategy in Historical Perspective, London, Anthem Press.

Chang, H. J.& Grabel, I.(2004) Reclaiming Development, An Alternative Economic Policy Manual, London & New York, ZED Books.

Cummings ,W.K.(1995) The Asian Human Resource Approach in Global Perspective, Oxford Review of Education Vol.21, No.1.

Dore, R. (1965) Education in Tokugawa Japan, London, Routledge & Kegan Paul.

Dore, R. (1997) The Diploma Disease: Education, Qualification and Development, Second Edition, London, London Institute of Education, University of London.

Dosi, G.(1988) Sources, Procedures, and Microeconomic Effects of Innovation, Journal of Economic Literature, Vol. XXV1, Sept.

Easterly, W.(2002) The Elusive Quest for Growth, Economists' Adventures and Misadventures in the Tropics, Cambridge, Massachusetts, London, England, The MIT Press. .

Harrison, L.E.(1985,2000) Underdevelopment Is a State of Mind: The Latin American Case Update Edition, London, New York, and Oxford, Madison.

Hicks, J.R.(1969) A Theory of Economic History, New York, Clarendon Press.

Hodgson, G. M. (1988) Economics and Institutions, A Manifesto for a Modern Institutional Economics, Cambridge, Polity Press.

Hodgson, G.M. (1999) Economics and Utopia: Why the learning economy is not the end of   history, London and New York, Routledge.

Kicker, B. (1966) The Historical Roots of the Concept of Human Capital, The Journal of Political Economy 74.

Koike,K. and Inoki,T. eds. (1990) Skill Formation in Japan and Southeast Asia, Tokyo, University of Tokyo Press.

Kuznets, P.W. (1988) An East Asian Model of Economic Development: Japan , Taiwan and South Korea, Economic Development and Cultural Change, Vol.36, No.3.   .

Lazaric, N. and Lorenz,E. eds. (2003) Knowledge, Learning and Routines, Vol.1 Knowledge and Learning, Cheltenham,UK and Northamton ,MA.,USA, Edward Elgar.

Levi-Faur, D. (1997) Friedrich List and the Political Economy of the Nation-state, Review of International Political Economy 4, Spring.

List ,F. (1827)   Outlines of American Political Economy, in   " Life of Friedrich List And Selections From His Writings" by Joseph Dorfman, New York, Augustus M. Kelley.

List, F.(1885)   The National System of Political Economy, translated by S.S.Lloyd (1966) New York, Augustus M.Kelley.

Lucas, R. E.(1988) On the Mechanics of Economic Development, Journal of Monetary Economics 22.

Marshall, A. (1964) Principles of Economics, An Introductory Volume, eight edition, London, Macmillan.

Meier, G. M. and Stiglitz, J.E. eds.(2003) Frontiers of Development Economics, The Future in Perspective, Oxford ,Oxford University Press.

Mill, J.S. (1965) Principles of Political Economy with Some of Their Applications to Social Philosophy, Vol. 2, .Robson, J. M. ed., University of Toronto Press.

Morishima , M.(1992) Capital and Credit, A new formation of general equilibrium theory, Cambridge, Cambridge University Press.

Morris, C.T. and Adelman, I. (1988) Comparative Patterns of Economic Development 1850-1914, Baltimore and London, The Johns Hopkins University Press.

Myrdal, G.(1972) Asian Drama, An Inquiry into the Poverty of Nations, A Condensation by S.S. King of the Twenty Century Fund Study, New York, Vintage Books.

Nonaka, I. and Takeuchi, H.(1995) The Knowledge- Creating Company: How Japanese Companies Create the Dynamics of Innovation, New York and Oxford, Oxford University Press.

North, D.C.(1990) Institutions, Institutional Change and Economic Performance, Cambridge, Cambridge University Press.

Ono, S.(2001) The Economics of Quasi- Markets, presented in The 3rd Annual International Workshop on Institutional Economics, University of Hertfordshire, UK,4-7,September.

Ono, S.(2002)   A Quasi-Market Economy and the Global Competition: Industrial Policy in Northeast Asian Countries, Presented in 6 th Annual EUNIP Conference, Abo Akademie University, Abo(Turk),

Finland,5-7 December.

Ono, S.(2003) Can a Communal Association Model of the Japanese Business Enterprise transform into its Company Law Model?: Is It a Stumbling Block to Industrial Development?:, Presented in 7th Annual EUNIP Conference, University of Porto, Porto, Portugal, 18-20 September.

Orru,M., Biggart,N.W. and Hamilton,G.G (1997) The Economic Organization of East Asian. Capitalism, Thousand Oaks, London and New Delhi, Sage Publications.

Oshio,T.(2002)The Economic Analysis of the Japanese Education,Tokyo, Nihonhyoron-sha(Japanese).

Penrose,E.D.(1959,1980) The Theory of the Growth of the Firm, Fifth Edition, Oxford,Basil Blackwell.

Polanyi, M. (1966, 1983) The Tacit Dimension, Gloucsster, Mass, Peter Smith.

Romer, P.M.(1986) Increasing Returns and Long-Run Growth,Journal of Political Economy, Vol.94, No.5.

Rousgakis, E.N. (1968) Friedrich List , the zollverein and the Uniting of Europe, College of Europe.

Sakamoto, F. (1977) The Employment History of Japan a story of a successful career life,Tokyo,Chuokeizai-sha(Japanese).

Schultz, T. W. (1993) Origins of Increasing Returns, Oxford UK & Cambridge USA, Blackwell.

Schumpeter, J.A.(1967) History of Economic Analysis, London, George Allen & Unwin Ltd.

Smith, A. (1950) An Inquiry into the Nations and Causes of the Wealth of Nations, edited by E. Cannan,Vol.2, London, Methun.

Takahashi,K.(1973) The Economic Development History of Japan, Vol..2, Tokyo, Toyokeizaishinpou-sha (Japanese).

Toyota,T.(1981) Education in Asia, Tokyo, Institute of Asian Economic Affairs(Japanese).The New Palgrave, eds. Eatwell J, Milgate, M.and Newman,P. (1987) A Dictionary of Economics, Vol.2, London and Tokyo, Macmillan and Maruzen.

Tsuda, S.(1976)   A Defense for the Japanese –style Management, Tokyo, Toyokeizaishinpo-sha (Japanese)

Wade,R.(1990) Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization, New Jersey, Princeton University Press.

Walsh,J.R.(1935) Capital Concept Applied Man, The Quarterly Journal of Economics, Vol.49. World Bank(1998) World Development Report1998/99: Knowledge for Development, Oxford, Oxford University Press.

An Empirical Investigation of the Course Website Acceptance Model (CWAM)

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ABSTRACT

There exists a plethora of technologies, including course websites that cater for the realization and expansion of eLearning in terms of its course-content delivery. Nevertheless, the technologies (i.e. course website) alone do not express the successful outcomes due to the implementation alone. Students' behavior and responses toward the technology (i.e. course website) will eventually determine whether the implementation is successful. Therefore, this paper seeks to highlight two important beliefs, i.e. perceived ease of use and perceived usefulness that has been widely applied to understand technology acceptance. More importantly, it remains the sole objective of this paper to validate the instrument of course website acceptance in a public institution of higher learning. Two main steps were involved in the validation of the instrument, which are 1) Exploratory validation of the initial R-type factor analysis and Cronbach Alpha reliability assessment, and 2) Confirmatory validation that includes convergent, discriminant and construct reliability assessment. The three constructs, i.e. course website usefulness, ease of use and usage were found to be just identified models that have sufficient regression weights. An item was dropped from course website usefulness, while three items each were dropped from the course website usefulness and ease of use constructs respectively. The findings suggest that the instrument that is in English might be the cause of these dropped items.

INTRODUCTION

The main contention of this paper is that eLearning tools do not ensure implementation success, let alone in promoting technology acceptance. Rather, students have to decide for themselves to embrace or behave receptively towards the course website that was intended to supplement their face-to-face classroom learning process. Nevertheless, the intention to accept or reject the course website is based on a series of tradeoffs between the perceived benefits of the course website and the complexity of learning (or using) it. This phenomenon can be reasonably explained by using the Theory of Reasoned Action (TRA), which essentially argues that social behavior, is motivated by an individual's attitude towards executing that behavior. Therefore, the change of behavior is the result of the function of one's beliefs about the outcome of the behavior and an evaluation of the value of each of those outcomes (Ji-Won Moon & Young-Gul Kim, 2001). The Technology Acceptance Model (TAM) pioneered by Davis (1989) advances the TRA and suggests that perceived usefulness (PU) and perceived ease of use (PEU) are key determinants that inevitably lead to the actual usage of the course website among students. PU is defined as the extent to which the student believes that using the course website would enhance his/her job performance. PEU on the other hand, is defined as the extent to which the student believes that using the course website would be free from effort (Davis et al., 1989).

LITERATURE REVIEW
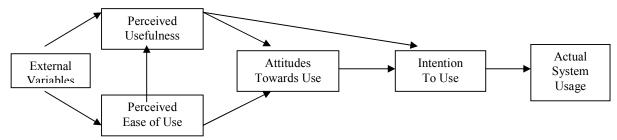
Figure 1: Technology Acceptance Model (TAM) (Davis et al., 1989)

Although TAM was influential in predicting and explaining technology acceptance in general, it lacks the specificity of users' opinions on specific system or technology (such as the course website). Due to this reason,

researchers (e.g. Davis & Venkatesh, 1996; Venkatesh & Davis, 2000) pursued vigorous validation and extension of the TAM under different environments to increase its explanatory power. Additionally, a number of modified TAM models (e.g. Agarwal & Prasad, 1998; Chau, 1996; Chau & Hu, 2001; Horton, Buck, Waterson & Clegg, 2001; Hu, Chau, Sheng & Tam, 1999; Igbaria, Zinatell, Cragg & Cavaye, 1997; Jiang, Shu, Klein & Lin, 2000) were developed to address acceptance of new technologies and their industrial application.

Similarly in Malaysia, the advancement of the TAM is kept abreast with the latest development and diffusion of technologies in respective industries. In 2001, Jantan, Ramayah and Chin conducted a study to understand multiple factors that influence PC acceptance among small and medium sized companies. Contrastingly, Ramayah et al. (2003) replicated the TAM to understand the receptiveness of Malaysian consumers in the E-banking sector. In addition, Ramayah, Siron, Dahlan and Mohamad (2002) used the TAM to study technology usage amongst owners/managers of SME's. Recently, the study was extended to include the moderating effect of self-efficacy to assess the acceptance of web-based supply chain management among SMEs (see Ramayah & Jantan, 2003).

Despite many applications that were accessed by TAM in Malaysia, there is no study that seeks to elucidate on the acceptance of course websites as a technology to enhance a student's performance. The fact that many studies in the west (e.g. Seal and Przasnyki, 2001) had highlighted the use of world wide web (WWW) as a tool to change the student – teaching model gives rise to the need for Malaysian education system to view WWW as a potential to improve our *status quo*. Applications of WWW that has been used extensively are e-discussion groups, e-boards and course websites has impacted the teaching – learning methodology in the information age (e.g. Brown and Neilson, 1996; Chrisman and Harvey, 1998). Seal and Przasnyki (2001) added that course websites improve students' understanding of the course materials. They suggested that course websites could be used as a teaching enhancement to the conventional methods.

RESEARCH INSTRUMENT

The three constructs of TAM (i.e. ease of use, usefulness and usage) that have been widely used and tested in previous research were applied to CWAM. A similar study researched (i.e. Selim, 2003) was to apply TAM to investigate course website usage acceptance among undergraduate students from an accredited college of business and economics at United Arab Emirates. The operational definitions for the constructs of CWAM were a modification from TAM, which are as follows:

- Course Website Usefulness (Cweb_U) – The students belief that using course websites will increase their learning performance, efficiency, and effectiveness (Davis, 1989);
- Course Website Ease of Use (Cweb_EOU) – The degree to which the student expects the use of the course websites to be free of effort (Davis, 1989);
- Course Website Usage (CWUSE) – The actual usage of the course website (which is used as an indicator to the acceptance of the course website) (Davis, 1989).

Table 1: List of Items

Cweb_U	Description
PU1	Using the course website improves the quality of the course work I do
PU2	Using the course website enables me to accomplish course tasks more quickly.
PU3	Using the course website makes it easier to study the course material.
PU4	Using the course website increases my productivity.
PU5	Using the course website enhances my effectiveness in the course work.
PU6	I find the course web site useful in the course work.
Cweb_EOU	
PEU1	Using the course website is easy for me.
PEU2	It was easy for me to become skillful at using the course website.
PEU3	I find the course website easy to use.
PEU4	I find the course website to be flexible to interact with.
PEU5	My interaction with the course website is clear and understandable.
PEU6	I find it easy to get the information I want from the course website.
CWUSE	
USE1	I use the course website a lot to do my course work.
USE2	I use the course website whenever possible to do my course work.
USE3	I use the course website frequently to do my course work.
USE4	I use the course website whenever appropriate to do my course work.

Note: All items employed the 7-point Likert scale (strongly disagree – strongly agree)

POPULATION AND SAMPLE

The population consisted of 360 students enrolled in the second year management degree from a particular public institution of higher learning. The sample was selected through convenience sampling. These students have been exposed to the course website during their Business Research Methodology coursework. The demographic profile of the respondents is presented in Table 1. Majority of respondents are female (17.5%), 22 years of age and from a Malay lineage that depicts the typical profile of a public institution of higher learning in Malaysia. Only a small percentage of respondents do not have Internet access from home (13.3%). It was also found that majority of them have been engaging in the Internet for 1 to 2 years and preferred Internet Explorer as their web browser. Most students engage in Internet activities only a few times per month with each session lasting for approximately 1 to 2 hours.

Table 2: Demographic Profile

Variable		Frequency	Percent
Gender	Male	19	79.4
	Female	86	17.5
Age	20 years old	23	21.9
	21 years old	39	37.1
	22 years old	43	41.0
Race	Malay	42	40
	Indian	15	14.3
	Chinese	44	41.9
	Others	4	3.8
Internet Access Availability	Yes	91	86.7
	No	14	13.3
Web	Internet Explorer	93	88.6
Browser	Netscape Navigator	0	0
	Both	12	11.4
	Others	0	0
Length of Use	< 1 year	0	0
	1 year – 2 years	41	39
	2 years – 3 years	33	31.4
	3 years – 4 years	0	0
	4 years – 5 years	15	14.3
	5 years – 6 years	16	15.2
Frequency of Use	Once a month	7	6.7
	Few times a month	37	35.2
	Once a week	21	20.0
	Few times a week	33	31.4
	Once a day	3	2.9
	Few times a day	4	3.8
Usage	Almost never	8	7.6
	< 30 mins/day	14	13.3
	30mins – 1hour/day	19	18.1
	1 hour – 2 hours/day	47	44.8
	2 hour – 3 hours/day	17	16.2
	> 3 hours/day	0	0

ANALYSES AND FINDINGS

An R-type exploratory factor analysis with Varimax rotation was performed to validate whether the items in each section loaded into their expected categories. As presented in Table 2, the results show two distinct factors for PEU and PU as well as a single factor for usage. Three items, each from PU and PEU were dropped respectively due to cross loading of items. The dropped items from PU reflect the long-term usefulness of using the course website. Since these students have been introduced to the course website without prior experience, this study believes that it will take a while before the students familiarize themselves with the technology and find it useful. On the other hand, the three dropped items from PEU might lead the respondents to misinterpret the ease of use of engaging in the course website as the usefulness of having an easy to use course website. This could also be a probable cause for the cross loading of items.

The variance explained for PEU and PU are 34.54 and 37.15 respectively, with cumulative variance of 71.69.Although the criteria used to identify the loadings by Igbaria et al. (1995) was that each item should load 0.50 or greater on one factor and 0.35 or lower on another factor, this study employed the 0.70 – 0.45 instead. There are two reasons for this decision, which are as follows: 1) due to the students relatively short exposure to the course website, the students might perceive the usefulness and ease of use construct to be somewhat related, and 2) using Igbaria et al. (1995) criterion would lead to an elimination of an item from PEU and PU construct, therein resulting in a common factor as tested in this study.

Table 3: Factor and Reliability Analysis for the Independent Variables

Variables	Factors	
	1	2
Perceived Usefulness		
Using the course website increases my productivity	.71	.340
Using the course website enhances my effectiveness in the course work	.82	.340
I find the course website useful in the coursework	.76	.421
Perceived Ease of Use		
Using the course website is easy for me	.42	.82
It was easy for me to become skillful at using the course website	.30	.82
I find the course website to be flexible to interact with	.17	.80
Variance (71.33%)	38.1	33.23
Eigenvalue	7.45	1.10
Reliability (Cronbach alpha)	0.89	0.87

MSA = 0.82, χ^2 = 1156.22, p<0.01
.

R-Type exploratory was also run for the dependent variable, that is the usage of the course website. An item was dropped, as there is insufficient measure of sampling adequacy.

Table 4: Factor Analysis for the Dependent Variable

Variable	Loadings
I use the course website a lot to do my course work	.85
I use the course website whenever possible to do my course work.	.77
I use the course website frequently to do my coursework.	.79
Eigenvalue	2.43
Percentage Variance	65.01
Reliability (Cronbach alpha)	0.73

MSA = 0.66, χ^2 = 65.42, p<0.01

EXAMINATION ON THE PSYCHOMETRIC PROPERTIES OF THE MEASUREMENT MODELS

This study believes that there should be four steps in assessing the validity and reliability of an instrument before being fitted into a structural model. The first step is the content validity, followed by convergent, construct, disciminant and nomological validity. However, the first step was omitted as the items for the measurement model had been in existence for close to two decades. Nevertheless, they have not been rigorously tested albeit a few attempts in various settings such as PC acceptance factors in small firms by Igbaria et al. (1997). For this purpose, this study seeks to test the constructs separately before fitting it into a structural model as a whole in future research. In other words, convergent and discriminant validity tests will be carried out, with each preceding validity measure less rigorous than the successive tests.

CONVERGENT VALIDITY

All constructs in the model (i.e. CWU, CWEOU, CWUSE) were tested and verified to ascertain that the items were related strongly to their respective construct. This confirmatory factor analysis (CFA) was run by using the structural equation modeling. CFA allows the specification of the exact relationship between the items and its latent construct. Using the criterion by Bagozzi and Yi (1988), all constructs registered above the suggested minimal level of convergent validity where regression weights above 0.6 are considered reliable. Figure 1 – 3 depicts the regression weights of the items to their respective latent constructs of perceived usefulness, ease of use and usage respectively. Since the three measurements models were just-identified (i.e. the number of sample moments equals the number of implied moments), it is unnecessary to identify how well the sample data

is fitted into the variance-covariance matrix. In other words, it is known that the observed measures meet the minimal requirement of the parameters that are estimated for just-identified models. In contrast, it is required to assess the model fit due to the number of observed measures that are greater than the parameters to be estimated for over-identified models. In such a case, there are many possibilities to fit the sample data into the variance-covariance matrix for the "best" solution. Therefore, it is deemed necessary to address whether the increased in the degrees of freedom has a "poor" impact on the model fit for over-identified models but not our case.
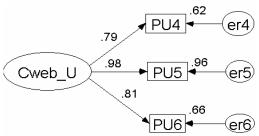
Figure 1: Convergent Validity for Perceived Web Usefulness
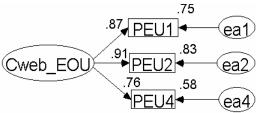
Figure 2: Convergent Validity for Perceived Web Ease of Use
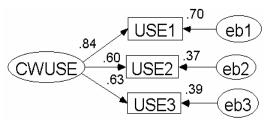
Figure 3: Convergent Validity for Web Usage

CONSTRUCT VALIDITY

The Cronbach Alpha has been the norm in assessing a construct's internal consistency. Despite its widespread use and support on reliability, internal consistency has to be measured again once the measurement of each construct has been finalized (Anderson & Gerbing, 1988). The formula is as follows:

$$\frac{[\Sigma \text{ (Standardized Loadings)}]^2}{[\Sigma \text{ (Standardized Loadings)}]^2 + \Sigma \text{ (1 – Standard error)}^2}$$

The value of each construct of inter-/intra-functional technological learning is presented in table 4.

Table 5: Construct Reliability

	Cweb_U	Cweb_EOU	CWUSE
$[\Sigma \text{ (Standardized Loadings)}]^2$	6.66	6.45	4.28
$\Sigma \text{ (1 – Standard error)}^2$	0.26	0.27	0.86
$\dfrac{[\Sigma \text{ (Standardized Loadings)}]^2}{[\Sigma \text{ (Standardized Loadings)}]^2 + \Sigma \text{ (1 – Standard error)}^2}$	0.96	0.96	0.83
Internal Consistency (Cronbach's Alpha)	0.89	0.87	0.73

As suggested by Nunnally (1978), all constructs registered higher construct reliability than the internal consistency of Cronbach Alpha greater than 0.7.

DISCRIMINANT VALIDITY

Since all items have displayed adequate convergent validity, the next step is to assess the discriminant validity between perceived web ease of use and perceived web usefulness. That is, the extent to which it measures its construct of interest and not to another construct. In general, it is assumed that the correlation between constructs exhibits discriminant validity if the correlation between constructs is not equal to 1.00. However, this study pursues the discrminant validity tests with more rigorous efforts through the χ^2 difference tests where the χ^2 for the two exogenous constructs are compared (i.e. between Cweb_U and Cweb_EOU). In the first model, the correlations between the two exogenous are fixed at 1.00. The χ^2 fit indices registered 74.96 (9 d.f.) for the first model, while the "freely estimated" model charted 39.24 with 8 d.f. (figure 4). Since the difference between both models exhibit a $\chi^2 > 3.84$ for 1 d.f, both Cweb_U and Cweb_EOU are demonstrated to be statistically distinct.
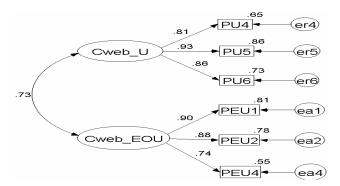
Figure 4: Freely Estimated Correlations between Course Website Usefulness and Ease of Use.

DISCUSSIONS AND CONCLUSION

The primary discourse of this paper is to describe a basic standard operating procedure in conducting an empirical investigation on the measurement models of course website acceptance. Despite the prevalent adoption of the TAM in various settings, this paper emphasized that validated measures from previous studies should go through a multi-stage tests for its instrument. The "calibration" process of the instrument is needed insofar as the probe (instrument) goes into new research territory where the dynamics of the settings are different. Among the differences that contributes to the environmental dynamics are as follows: 1) the work and national culture and 2) respondents whose *lingua franca* are not English). With regards to the former, public and private institutions of higher learning have different extent of use and proficiency in terms of the English language. Undergraduate courses are conducted in English in private institutions whereas public institutions adopt a mixture of both English and Malay language in the delivery of their course content. In addition, the profile of respondents in both institutions plays a role in the validity of the instrument. Given that Malays comprise majority of those that enrolled in public institution of higher learning, language might be a problem in answering structured questionnaires that are in English. In this study, Chinese and Malays account for approximately more than 80 percent of the respondents. An observable fact among these respondents are that both groups tend to converse among themselves in their mother tongue although the business research method course is taught in both English and Malay language.

With all this in mind, the validity tests that were carried out are effective in removing items which are biased and hard to comprehend. The R-type exploratory factor analysis (EFA) is believed to provide an overall assessment on the students' ability to understand the differences between each dimension and its intended measured construct. In other words, EFA managed to address the basis of the differing perceptions by rotating and illustrating that ease of use and usefulness are actually two distinct concepts, while course website usage is a single distinct concept. Therefore, respondents in this research still managed to view each concepts as separate constructs, albeit having to sacrifice items which are confusable. In addition, the CFA was used to confirm each item's internal consistency to their respective construct. For the course usage construct, both items which are "I use the course website whenever possible to do my course work" and "I use the course website frequently to do my coursework"' just managed to meet the minimal requirements of internal consistency as suggested by Bagozzi and Yi (1988). In our case, the latter is believed not to capture the latent meaning of usage, given that undergraduate students would use the course website when mandated instead of voluntary. Hence, perhaps then the wordings of "whenever possible" should be changed to "whenever necessary". The extent of usage as depicted by the former item, on the other hand, suggests that the frequency of usage should be benchmarked

against the number of times the student is required to extract information from the course website. Again this is the scenario between mandated and voluntary use of technology.

However, one might argue that Selim's (2003) research provided a good model fit without having to sacrifice any items from its measurement model, which was applied to a similar environment as us – i.e. whose *lingua franca* are not in English. This study seeks to highlight that Selim (2003) used Maximum Likelihood Estimation (MLE), which is an estimation procedure that is sensitive to sample size above 400. Given that Selim (2003) had 450 respondents, his data might be and sensitive to data changes, which proves to show that all his measurement models indicate an overly good fit (based on the level of significance of the χ^2) without sacrificing any items. Hair et al. (1998) recommended that a sample size between 100 to 200 is most appropriate This study employed 105 sample size which is within Hair et al.'s (1998) recommended sample size (100-200) for dealing with structural equation modeling with MLE as the estimation procedure.

DIRECTIONS FOR FUTURE RESEARCHERS

Similar to all other researches, there exist allowances for extension of this research endeavor. In terms of the model fit, it is quite likely that this study's research model caters to only the public institution that we set out to research. As the case with most just identified models, where there is a concern over the lack of generalizability –this study's findings should be interpreted with caution by taking into consideration the profiles of the respondents and the dynamics of the environment. In terms of the methodological forefront, future researchers should extend the current technology acceptance items to developing countries where technology adoption is relatively new. The generation of the new items that reflect technology acceptance should also consider culture to be among the major barriers. With regards to statistical procedures, it should be reminded that basic statistical classical assumptions (such as adequate/optimum sample size) should be met when validating a model. For studies with large sample size (e.g. 400), it is suggested that future researchers should employ the split-half method to validate the measurement models. That is, the measurement models for both data sets are compared to verify whether there are any significant changes in terms of the goodness of fit indices.

REFERENCES

Agarwal, R., & Prasad, J. (1999). Are individual differences germane to the acceptance of new technologies?, *Decision Sciences*, 30(2), 361-391.

Anderson, J.C. & Gerbing, D.W. (1988). Structural Equation Modeling in practice. *Psychological Bulletin*, 103, 411-442.

Bagozzi, R.P. & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of Academy of Marketing Science,* 16, 74-94.

Brown, C. E. & Neilson, N. L. (1996). Enhancing business classes with the World Wide Web. *Journal for Business*, 71(6), 317-324.

Chau, P. Y. K. (1996). An Empirical Assessment of a Modified Technology Acceptance Model, *Journal of Management Information Systems*, 12 (2), 185-204.

Chau, P. Y. K. (2001). Influence of Computer Attitude and Self-Efficacy on IT Usage Behavior. *Journal of End User Computing*, 12(1), 26-33.

Chrisman, N. R. & Harvey, F. J. (1998). Extending the classroom: Hypermedia-supported learning. *Journal of Geography in Higher Education*, 22(1), 11-20.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease Of Use, and User Acceptance of Information Technology*, MIS Quarterly*, 13, 983-1003.

Davis, F. D., Bagozzi, R.P. & Warshaw, Paul R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982-1003.

Davis, F. D. & Venkatesh, V. (1996). A Critical Assessment Of Potential Measurement Biases In The Technology Acceptance Model: Three Experiments*, International Journal Of Human-Computer Studies*, 45, 19-45.

Hair, J., Anderson, R., Tatham, R. & Black, W. (1998). *Multivariate Data Analysis* (5th ed.). New York: Prentice Hall.

Hu, P. J., Chau, P.Y.K., Sheng, O.R.L. & Tam, K.Y. (1999). Examining the Technology Acceptance Model Using Physician Acceptance of Telemedicine Technology*, Journal of Management Information Systems*, 16(2), 91-112.

Horton, R.P., Buck, T., Waterson, P.E. & Clegg, C.W. (2001). Explaining Intranet Use the Technology Acceptance Model, *Journal of Information Technology*, 14, 237-49.

Igbaria, M., Gumaraes, T. and Gordon, B.D. (1995). Testing the determinants of microcomputer usage via a Structural Equation Model. *Journal of Management Information Systems*, 11 (4), 87-114.

Igbaria, M., Zinatelli, N., Cragg, P. & Cavaye, A. L. M. (1997). Personal Computing Acceptance Factors in Small Firms: A Structural Equation Modeling*, MIS Quarterly*, 21 (3), 279-305.

Jantan, M., Ramayah, T., & Chin, W.W. (2001). Personal Computer Acceptance by Small and Medium Companies Evidence from Malaysia, *Jurnal Manajemen & Bisnis*, 3(1), 1-14.

Jiang, J.J, Hsu, M.K., Klein, G. & Lin., B. (2000). E-commerce User Behaviour Model: An Empirical Study, *Human Systems Management*, 11(4), 265-76.

Ji-Won Moon, and Young-Gul Kim (2001). Extending the TAM for a World-Eide-Web context, *Information & Management*, 38, 217-230.

Nunnally, J. C. (1978). Psychometric Theory, 2nd ed. New York: McGraw- Hill Book Company.

Ramayah, T. and Jantan, M. (2003). Attitude And Intention To Use Web-Based Supply Chain Management (SCM) Among SME'S: Moderating Effect Of Self Efficacy, The Third International Conference on Electronic Commerce Engineering (ICeCE2003), Hangzhou, China.

Ramayah, T., Jantan, M., Nasser, M., Razak, R.C. & Koay., P.L. (2003). Receptiveness Of Internet Banking By Malaysian Consumers. *Asian Academy of Management Journal*, (8) 2, 1-29.

Seal, K.C. & Prszasnyski, Z.H. (2001). Using the world wide web for teaching improvement. *Computers & Education*, 36 (1), 33-40.

Selim, H. M. (2003). An empirical investigation of student acceptance of course websites. *Computers & Education,* 40, 343-360.

Venkatesh, V. & Davis, F. D. (1996). A Model of the Antecedents of Perceived Ease of Use: Development and Test*, Decision Sciences*, 27 (3), 451-481.

Web-Based Strategies: A Crucial Expansion For Proton

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ABSTRACT

As the growth of the Information technology continues to change the way business operates and how people conduct their daily activities, automobile sectors are not exceptional. In Malaysia, Proton Company (The largest Malaysian automobile manufacturing company) has had to devise innovative global online services in order to remain competitive and gain more market place in Asean Free Trade Area (AFTA). Topmost amongst these paradigms are the use of online customer's database systems and services as well as the adaptability of just-in-time (JIT) approaches. Based on the above, this article presents a prototype of information extraction and management system between customers and Proton agents by using World Wide Web and Oracle to enhance the traditional services provided by Proton.

INTRODUCTION
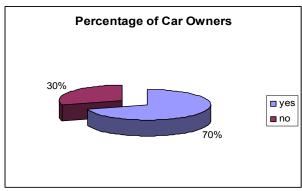
In recent years, many organizations have recognized the potential of Internet as a means to improve profitability by increasing productivity and market penetration while reducing costs. Many companies have to adequately correspond to this change, and to this end they need new systems and paradigms to earn a competitive power. It is vital for companies to respond more quickly and dynamically to customers' requirements and to have the capability of maintaining and management customers' databases online.
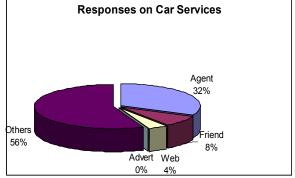
Automobile industry in Malaysia began in 1962 when Ford Motor Company of Malaya was incorporated and began operation in Singapore. Proton was incorporated in 1983 to manufacture, assemble, and sell motor vehicles and related products. Its model line up includes Waja, Satria, Wira, Iswara, Arena, Perdana, and Juara. Currently, its factory at Shah Alam is capable of producing 240,000 vehicles per year (http://www.proton.com.my/about_proton/history/index.php).

Drawing from the model proposed in this paper, we present some views of Internet-based applications that may be useful when evaluating and managing Proton database system. Specifically, the paper presents the future marketing trends and extension of the system in order to increase the market share as well as provide better customer oriented to maintain customer loyalty to the Proton. The rest of the paper is organized as follows: The next section describes the data collection methodology used and the findings obtained. Section three looks into the impact of digital market place for Proton. The section also proposes a prototype database system design for future expansion and customers' online services. Finally the paper concludes in section four.

DATA
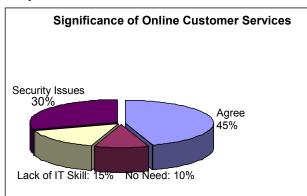
In this paper, semi-structured interviews were used with some of Proton's senior managers. Short, semi-structured interviews were also carried out with some Proton's agents. The main objective of the interviews was to provide evidence and information which on analysis would be capable of comparison with existing theory. Secondary data were obtained from company reports, company newsletters, local literature and local newspapers. Others include questionnaires to the general public.

Percentage of Car Owners

30%

70%

yes
no

Do you own a car?

Responses on Car Services

Agent
32%

Others
56%

Friend
8%

Advert
0%

Web
4%
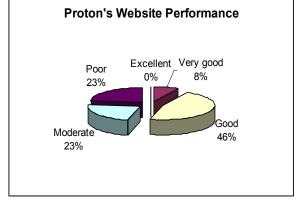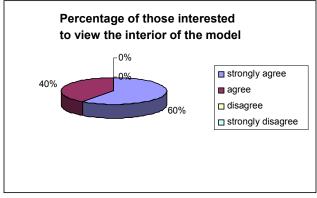
How to do get to know more about your car services?

Significance of Online Customer Services

Security Issues
30%

Agree
45%

Lack of IT Skill: 15%   No Need: 10%
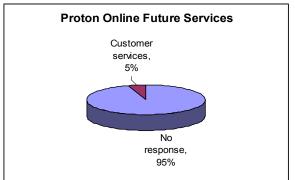
Do agree that customers' online database is significant? If not why?

Proton's Website Performance

Poor
23%

Excellent
0%

Very good
8%

Moderate
23%

Good
46%

How do you rate the current proton website performances?

Percentage of those interested to view the interior of the model

0%

0%

40%

60%

strongly agree
agree
disagree
strongly disagree
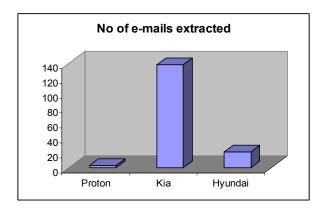
Will you like to view the interior of the car online?

Proton Online Future Services

Customer services,
5%

No response,
95%
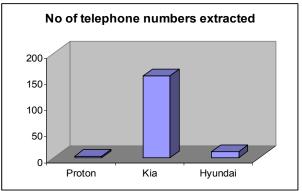
What are the things you wish to see on the Proton website in the future?
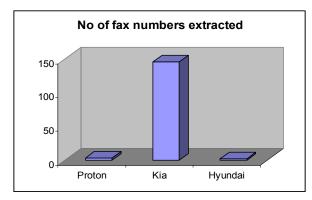
Figure 1: Questionnaire Responses
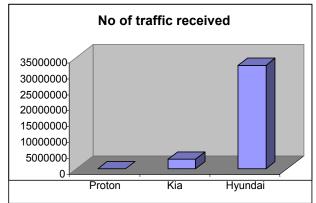
The focus of the questionnaire is to enable us to make a deeper observation on the current situation about how people select their ideal cars and what are the online services they expect from the company's web site. The outcomes of the questionnaire are shown in Figure 1 above.
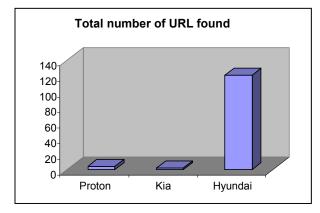
Web data extraction was conducted to show the e-readiness of three automobile companies namely Kia, Hyundai, and Proton. These two companies were selected as they are Proton's competitors in Malaysia. However, it should be noted that Kia established in 1944 is the oldest automobile company followed by Hyundai which was founded in 1967, while Proton incorporated on May 7, 1983 is the youngest.
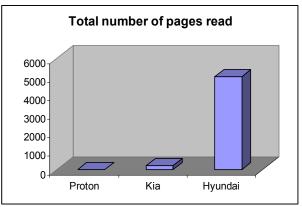
Figure 2: Web Data Extractions: Proton, Kia, and Hyundai
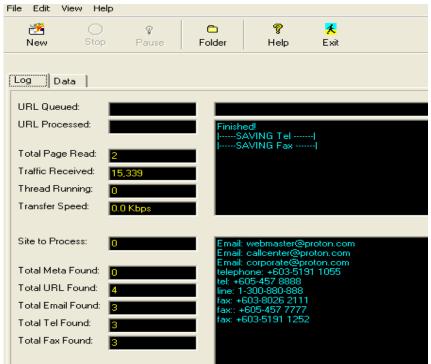
Figure 3: Proton's Web Data Extraction

The result of the data extraction is shown in the following figures (Figure 2). The results show that Kia and Hyundai are far ahead of Proton in terms in e-business readiness. The data were extracted from the following websites: (http://www.proton.com.my, http://worldwide.hyundai-motor.com/, and http://www.kiamotors.com/). The data extraction result from Proton's website is shown in Figure 3.

Based on the above data, it is essential for Proton to provide online services solutions. In providing solutions of any kind, customer service is an essential component as it facilitates the communication, the process and the guidance of customers in fully benefiting from what is being offered.

DIGITAL MARKETPLACE FOR PROTON

To gain the competitive edge and meet the escalating expectations of customers, businesses have to review and refresh their website as well as online marketing strategies. Businesses realize that websites are an integral part of an organization to promote products, deliver services and information, manage transactions and facilitate communication. An online presence could provide better quality customer service. This is because the new online economy is driven by a "service" attitude philosophy.

Proton is believed to be the largest and most modern automobile manufacturer in Southeast Asia; covering 862,000m employing 4,400 people of which 2,400 are direct workers (Mike et al., 1998). It has four subsidiary companies based locally and overseas. The company has also established a total of eight associate companies or direct local and overseas suppliers, which involve components manufacturing to provide synergy to the company's operations (Ferguson, 1990; Whittington, 1993). Due to the increasing number of Internet users globally and widely distributed subsidiaries and associate companies, it is vital for Proton to make the best use of Internet and gain competitive advantages. For instance, in 1998 there were 300,000 registered Internet users supported by TM Net and Jaring in Malaysia, excluding registered users of Maxis Net and Time Net (Source: Computimes 18 May 1998). IDC predicts that the strong growth of internet users in Malaysia will reach 6.8 million next year (i.e.2005), whereas, Internet buyers will reach 4.4 million (www.idc.com.my). Moreover, under AFTA rules, competition in companies from participating countries is expected to intensify. A report by (Yusri, 2003) indicates that Proton is unlikely to compete in the AFTA market. It is therefore crucial for Proton not only to adopt e-commerce strategy but also to incorporate e-business strategies.

Current tactics for developing the Internet market depend on a company's nature and structure, but generally, two main patterns as described by (Quelch and Klein, 1996) can be adapted by Proton. These are; the use the Internet to assist current practices, by providing product information or customer support, or carrying out product transactions (see Figure 4).

```
┌──────────────────┐          ┌──────────────────┐
│  Traditional     │   ───▶   │  Online version  │
│  practices       │          │  of traditional  │
│                  │          │  practice        │
└──────────────────┘          └──────────────────┘
                                        │
                                        ▼
┌──────────────────┐          ┌──────────────────┐
│  Market          │   ◀───   │  Combination:    │
│  development,    │          │  traditional     │
│  transactions    │          │  and online      │
└──────────────────┘          └──────────────────┘
```
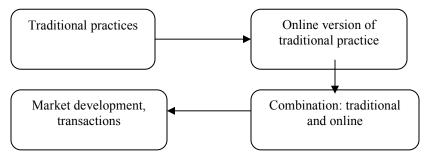
Figure 4: Market Development Strategy: Lower-level

This pattern is typically used by multinational corporations. Proton may also use the Internet for all of the above, as well as to distribute products to customers (trial versions), collect feedback, and make additional sales on refined or new products (see Figure 5). This pattern, typically used by Internet startups, can be viewed as a model for the concurrent development of products and markets.

```
┌──────────────────┐     ┌──────────────────┐     ┌──────────────────┐
│  Product         │ ──▶ │  1st Transaction:│ ──▶ │  User's          │
│  development      │     │  Product         │     │  satisfaction    │
│  internal support│     │  information,    │     │                  │
│  mechanism       │     │  free services   │     │                  │
└──────────────────┘     └──────────────────┘     └──────────────────┘
                                                           │
                                                           ▼
┌──────────────────┐     ┌──────────────────┐     ┌──────────────────┐
│  Market          │ ◀── │  Customer        │ ◀── │  2nd Transaction │
│  development      │     │  support,        │     │                  │
│                  │     │  customer        │     │                  │
│                  │     │  feedback        │     │                  │
└──────────────────┘     └──────────────────┘     └──────────────────┘
```
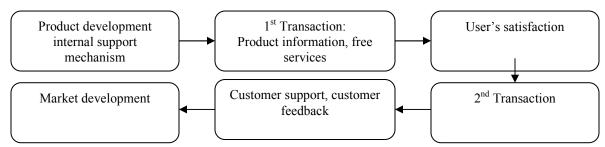
Figure 5: Market Development Strategy: Higher-level

The adaptation of Internet-based application by Proton should revolutionize at least four aspects of traditional trade:
- Distribution networks of goods and services;
- Customer accessibility to products and services and related information;
- Payment methods; and
- Customer feedback/market research.

Aside from being comprehensive, focused, and long-range, any strategy to develop a digital marketplace for Proton must take customer cultures into account. Developing the Proton digital marketplace requires more content in the Malay, Chinese, Hindu, and English languages (for international customers). Applications should be created with an eye toward improving customer public services. Further, more efforts are also needed to attract individuals living outside Malaysia to the Proton digital marketplace. For example, major languages of AFTA members should also be included.

Additional tactics to develop Proton digital markets include:
- Focusing on products that can be easily differentiated with information provided by the Internet.
- Avoiding information overload on the Web page, which must communicate points succinctly. Too much information can take too long to download and can be confusing. Simple language also helps minimize language barriers and differences in assimilation rate among cultures (Borenstein et al, 1996).
- Establishing credibility by guaranteeing security and privacy. The security of Internet transactions should be emphasized. Liability for misuse should be on companies and not customers.
- Creating international legislation to ensure the legal validity of e-contracts. This will provide a sound legal framework supporting local and international transactions.

- Developing "matchmaking" mechanisms that allow buyers to identify car models with certain characteristics, and Proton agents to discover buyers with specific profiles.

Based on the above points and the feedbacks received from the questionnaire and data obtained as a result of data extraction as shown in section 2, a prototype for customers' database system and online services is shown below. The main focus of the prototype is to design online database system to enhance the current customer services (or booking services in particular). First, Figure 6 below shows the rich diagram of the system. The shows a booking database server used to store customers booking which can be retrieved and processed by Proton agent, manager, or staff. The system's entity relationship diagram (ERD) is shown in Figure 7 below. It shows various entities considered and their relationship in the proposed design.
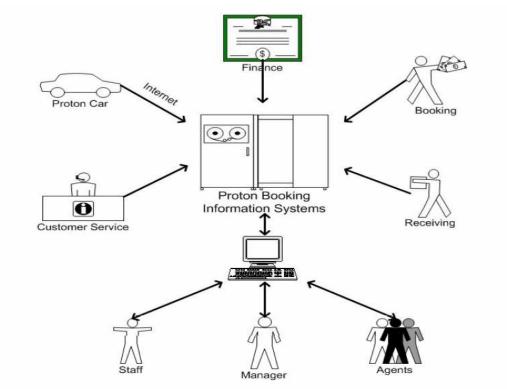
Figure 6: System's Architecture
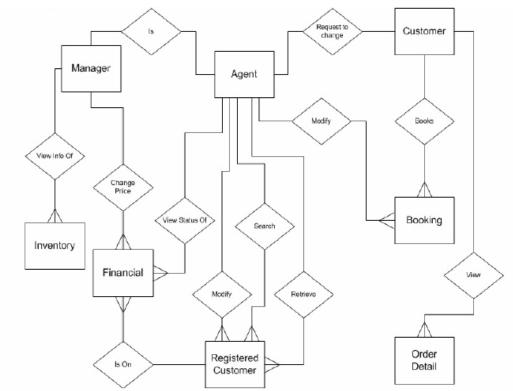
Figure 7: ERD Diagram of the Proposed System
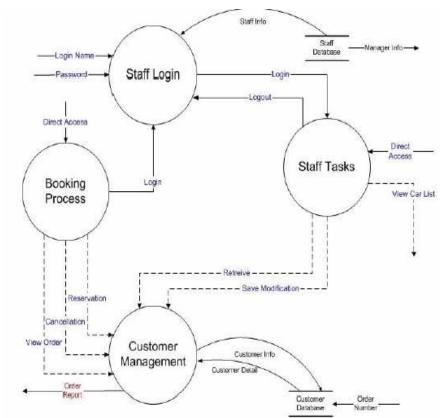
Figure 8: System's Data Flow Diagram

For simplicity, details of the various entities used in the prototype will not be discussed. Focus will be based on customer, agent/staff, and booking entities. A data flow diagram for the booking scenario is shown in figure 8 above.

A screenshot for the online booking component is shown in Figure 9 below. The system is design shows a simple example of online customer services (booking) based on customers' database system.
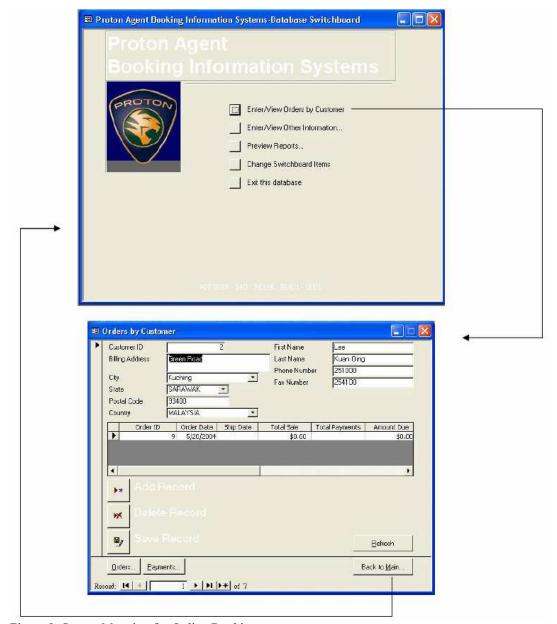
Figure 9: Screen Mapping for Online Booking

CONCLUSION

This paper discusses some of the Internet strategies that need to be implemented by Proton in order to compete in AFTA and global market in general. In addition to the digital marketing strategies, it is equally important for Proton to adapt Just-in-Time (JIT) philosophy. JIT has as its basics objectives the elimination of wastes. Anything other than having the right amount of the right material at the right place at the right time required to add value to the product is considered to be waste. According to (Mike et al., 1998), Proton is not fully implementing JIT but rather implementing various transitory JIT practices. Transitory JIT is ultimately unsatisfactory from the point of view of world-class manufacturing. Though, it has served Proton well so far but will be insufficient in the near future.

Unless these issues are well-addressed, it is likely that Proton might suffer stiffer competition from the impact of AFTA due to the lack of e-business strategies.

REFERENCES

Borenstein, N.S. et al.(1996), Perils and pitfalls of practical cybercommerce, *Commun. ACM 39*, 6, 36–44.

Ferguson, C.H. (1990), "Computers and the coming of the US keiretsu"; *Harvard Business Review*, No. 4, July-August, pp. 55-70.

Proton Company Info 2004, available online: http://proton-.com.my

Jayasankaran S (2004), Malaysia's Proton Faces Uncertainty, The Wall Street Journal, Estern edition, New York N.Y, July 14, 2004, pp1.

Mike Simposn, Geoff Sykes & Adini Abdullah (1998), 'Case study: transitory JIT at Proton Cars, Malaysia', *International Journal of Physical Distribution & Logistics Management*,

Quelch, J.A. and Klein, L.R. (1996), The Internet and international marketing, *Sloan ManagementReview 37, pp* 60–75.

Whittington, R. (1993), What Is Strategy - And Does It Matter?, Routledge, London.

Yusri Nuqman, (2003), Proton will likely exit together with Mahathir, Malaysia Kini, http://www.malaysiakini.com/letters/200308050034976.php , viewed 2 May, 2004

An Evaluation Of Uml Extended Modeling Technique in Analyzing and Designing Web-Based Applications

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ABSTRACT

The development of Web-based applications such as the e-commerce and e-business applications has increased dramatically. Since Web-based applications required special modeling technique for navigational and presentational model, a new and standard modeling technique, which is known as, UML extended has been proposed. The purpose of this research is to evaluate the suitability of this UML extended modeling technique in analyzing and designing Web-based application. The UML extensions evaluated in this paper are illustrated by the design of Web-based application for an Online Hotel System. After experimenting UML extended by doing the design of the case study mentioned, it is found that UML extended is suitable and appropriate for modeling the Web-based applications.

INTRODUCTION

Popularity of Web-based application in business application such as e-commerce and e-business is increasing dramatically in these last few years. Web-based application is easily defined as a computer application that can be accessed by a web interface. Unlike a traditional web site, which is content-based and static, Web-based application is more powerful because it can react based on the user's input. It can do every thing like a desktop application can do plus the ability to be accessed from every part of the world that has the Internet facility.

A lot of company have ventured and implemented this new kind of application because it provides unlimited user access compared to desktop application. However, a lot of Web-based application is the result of an ad hoc implementation. Due to the poor analysis and design, Web-based application such as e-commerce applications becomes very hard to maintain. Because of the need for complex Web-based application is increasing, a standard design method should be applied (Connalen, 1999).

UML extended is one of the methods proposed (Hennicker and Koch, 2000). It provided a complete mechanism to model the conceptual, navigation and presentation aspect of a Web-based application. In this research, the UML extended has been applied in developing an Online Hotel Reservation System

Complexity Of Web-Based Application

Web-based application is a new technology in information system. It only emerged in 1990's (Connalen, 1999). Due to the immaturity of Web-based application technology, it is still lack of standard methodology on how to develop and maintain it. Web-based application is always begin as an ad hoc development and quickly become inmaintainable due to the unstructured analysis and design (Hennicker and Koch, 2000).

The complexity of a Web-based application doesn't come to the attention of a Web-based application developer. Web-based application always has been look as the way of traditional web site. A lot of people didn't realize that Web-based application is actually has evolve it functionality from information disseminator to on-line transaction,

enterprise wide planning and scheduling system. This false perception will not help to build a Web-based application in the way it should be built.

Methodology For Web-Based Application

As many of corporation realizes how important the standard methodology in Web-based application, many of them has emerged in this last few years. There are two main methods that applied when designing Web-based application (Hennicker and Koch, 2001). They are entity-relationship and object-oriented techniques. Isakowitz, Stohr and Balasubramnian (1995) proposed a Relationship Management Methodology (RMM). Whereas Schwabe and Rossi (1998) have invented methodology called Object-Oriented Hypermedia Design Method (OOHDM). They use entity-relationship techniques and also introduce their own notations.

Connallen (1999) introduced a more comprehensive and standard methodology called UML extension. He focuses on the Rational Unified Process and the architecture of Web-based applications. Sauer and Engles (1999) have proposed the extension for multimedia applications, which emphasizes on multimedia modeling processes. Baumesiter, Koch and Mandel (1999) produced another UML extension that focuses on modeling elements for the navigational and presentational design.

Unified Modeling Language (UML)

UML is a standard modeling convention that is use to specify or describe a software in terms of object (Booch, Rambaugh and Jacobson, 1999). This notation has emerged as a result of the introduction of object technology. UML is preferred by the analyst due to it easy-to-understand diagram. Analyst can use this understandable diagram to gain user requirement of the system. These diagrams include use case diagram, class diagram, sequence diagram, deployment diagram, collaboration diagrams, state diagram and activity diagram.

UML For Web-Based Application

A lot of researches have been done to identify how UML can be extended to model Web-based application. Connalen (1999), has shown how Web-based application architecture can be modeled using UML. Web-based application requires an extension of the existing UML in order to model the navigational and presentational aspects, which is considered as the most critical part of the Web-based application development. Hennicker and Koch, (2001) has proposed three steps in developing and designing Web-based application; those steps are conceptual, navigational and presentational design.

Model of problem domain are produced in conceptual model. This model is build through classes and associations between them. The output of this stage is class diagram. Navigation model will be developed based on conceptual design. This stage will be completed in two steps: definition of navigational space model & development of navigational structure model. Navigational space model shows which class of the conceptual model can be visited through navigation in Web-based application and navigational structure model shows how that navigation can be done. (e.g. through *menus, indexes, guided tours, queries, external nodes* and *navigational contexts*). (Hennicker and Koch, 2001).

In presentational design, the abstract of user interfaces is defined. It presents how the navigation will be implemented in user point of view. It includes defining how navigation nodes will appear, selection of user interface object to activate navigation and defining the transformation of user interfaces once each nodes is activated. There a lot of works and research that have done by Nora Koch (2001) and her team in order introduce UML extended for designing Web-based application.

RESEARCH METHODOLOGY

In order to get a clear understanding of the research done, researcher have analyzes a lot paper and work that related to the title proposed. Using this method, researcher gets information about Internet technology, Web-based

application and methodology involve in modeling it and how UML can be extended to model Web-based application.

UML Modeling

After doing some information gathering with document analysis, researcher will draw UML diagram to model Web-based application. By doing this, researcher will understand clearly what steps is involve and how it have to be carried out when designing a Web-based application. UML models will be presented by drawing four types of diagram, which are the use case diagram, class diagram, navigation structure model and static presentational model. Navigation structure model will be derived from conceptual model and static presentational model are based on the navigation structure model.

System Prototyping

A prototype of a Web-based application will be developed based on the UML model. For this purpose, researcher has chosen to develop a prototype of Online Hotel Reservation. Hotel Online Reservation system is chosen because it fulfill the characteristic of a Web-based application and it also have good business value.

ANALYSIS AND FINDINGS

To analyze UML extensions, researcher has designed and developed an Online Hotel System. Researcher has noticed that in any type of application the importance of use case diagram can't be denied. It represents the abstract of the whole system. The use case diagrams designed for Online Reservation System are shown in figure 1.
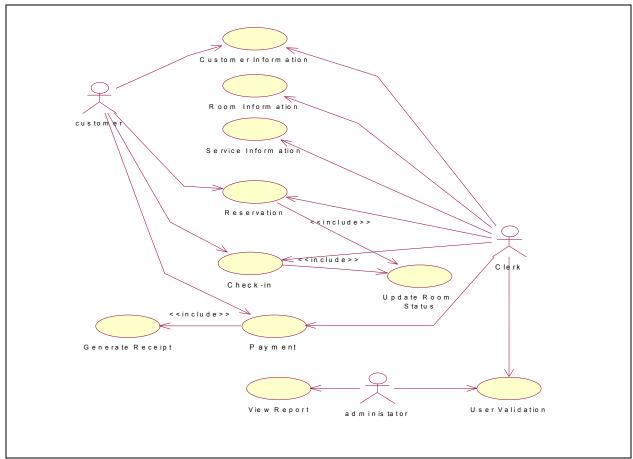
Figure 1: Use Case Diagram

Online Hotel System consists of ten use cases. They are Customer Information, Room Information, Service Information, Reservation, Check-in, Payment, User Validation, View Report, Generate Receipt and Update Room Status.

Conceptual design for this system is represented by class diagram. This conceptual design is not included any extended notation yet. However it is necessary to have this design because the navigation structure design of Online Hotel System will be derived from this conceptual design. Conceptual design in UML notation is represented by class diagram. The class design is shown in figure 2.
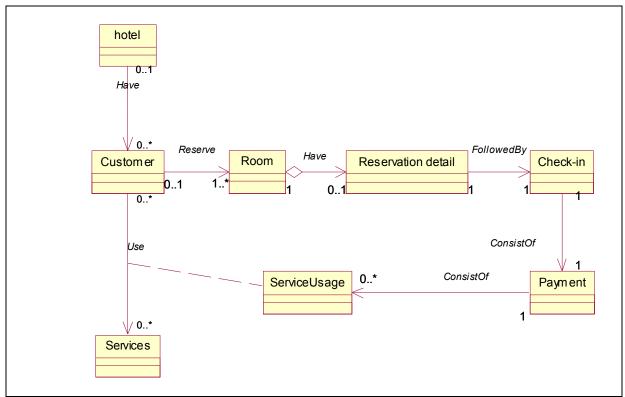
Figure 2: Class Diagram

Online Hotel Reservation are consist of 8 classes which are hotel, customer, room, reservation detail, check-in, payment, service and service usage. Navigation path is considered as a critical part in developing Web-based application. To represent navigation path of Online Hotel System, researcher has develop navigation structure diagram as suggested by (Hennicker and Koch 2001). In order to model navigation structure of a Web-based application they have introduced several additional notation.

In constructing the navigation path of a Web-based application, researcher have use stereotype navigation class. The navigation structure model for Online Hotel System is shown in the figure 3. Navigation classes name are similar with the conceptual classes. Although some of the classes from conceptual design can be omitted according to their navigability, in Online Hotel System there are no omitted classes because researcher found that web users could visit all conceptual classes. It means that classes in conceptual design also acted as navigation classes in navigation design in Hotel Online System.

There are 3 menus involves in the model. The menus are hotel menu, which also become the main menu, reservation menu and service menu. There are 2 ways how to access the room: Hotel menu and Reservation menu. The method for accessing room is guided tour. This method is applicable from both menus.

Reservation in hotel menu will bring user to reservation menu. Reservation menu consist of Home, Reservation, Cancel Reservation and Room. Home is a navigation path to enable users to go back to main menu. Reservation and cancel navigation will bring user to the same class but with different method. Reservation class is visited by

guided tour and cancel reservation is visited by query using reservation ID. Check-in in hotel menu will bring user to the check-in class. From check-in class user can also visit Customer class using guided tour.

Service is a navigation path that will bring user to another sub menu. In service menu there are home, service information and service indexes. Home in service menu have similar functionality with home in reservation menu. Same with reservation, service also can be visited by 2 different paths with different method. Service information will go to service class by guided tour. On the hand services index will go to service class using index. Service usage and payment can be visited directly from hotel menu using query access primitive.
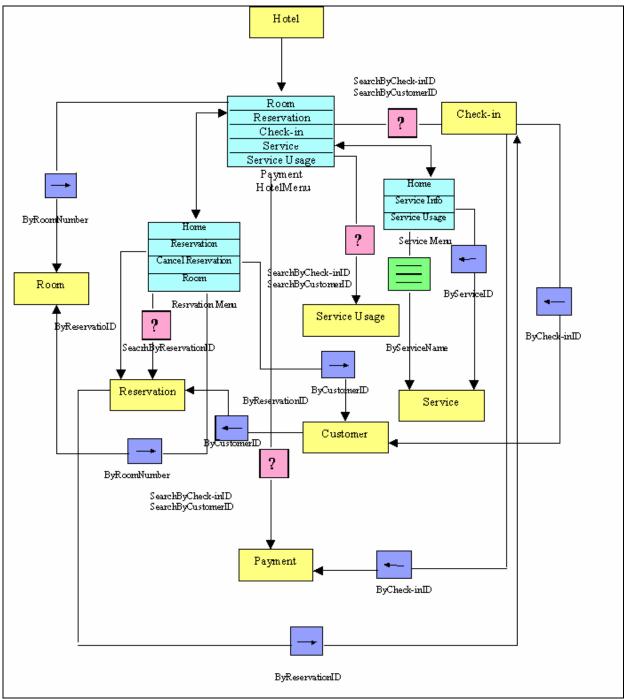
Figure 3: Navigation Structure

Presentation aspect of Online Hotel System is shown in the static presentation diagram. In presentational model there are seven extended classes. However in Online Hotel System, researcher only use 4 of them based on the

system requirement. They are text, image, anchor and anchored collection. For each class in navigation structure there must be a presentational class diagram for them. This diagram will represent the actual interface that will be use by web users. Each of the attributes of the class that will be shown to the user must be defined in this diagram. Examples of the presentational class diagram are presented in the figures 4 to figures 5.
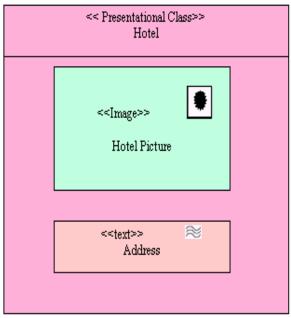
Figure 4: Presentational Class (Hotel)
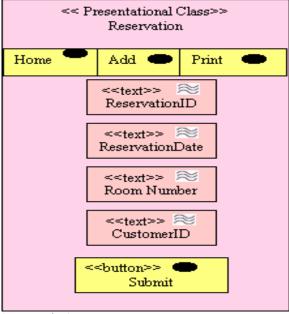
Figure 5: Presentational Class (Reservation)

Presentational class however is not enough to describe the presentation aspect of a Web-based application. Assume that one presentation class is equal to one page in a web site. In real implementation, more that one page is displayed at one time. To determine which page will displayed at what location, frameset diagram is developed. Frameset must be draw for each access primitive define in the navigation structure model. As there are 3 menus in navigation structure model, there must be 3 frameset that represent those menus. Sample of the frameset is shown in the figure 6.
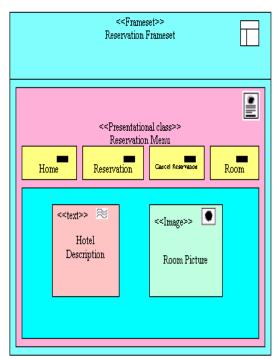
Figure 6: Frameset (Reservation)

To really understand what is this structure really mean when developing Web-based application, let us look at real implementation of the design made. Figures 7 and 8 show what will happen to actual implementation if we are really followed what have been designed.

Figure 7 shows the first page of Online Reservation System. Figure 8 is the presentational frameset for that page. Note how each of the object in the design is corresponding to the actual implementation. Clicking on the home in reservation menu will bring you back to the main page. Clicking on the Reservation on reservation will bring users to the page below. This page doesn't show in the navigation structure model as well as in the presentational model because it doesn't represent any class in those models. This page only acts as a determining page whether user will be asked to enter their personal detail or not.

After experimenting UML extended by developing the design for online reservation and made a prototype based on the design made, researcher found that it UML extended is successfully presenting the navigation and presentational aspect of a Web-based application.

Figure 7: Online Reservation Page
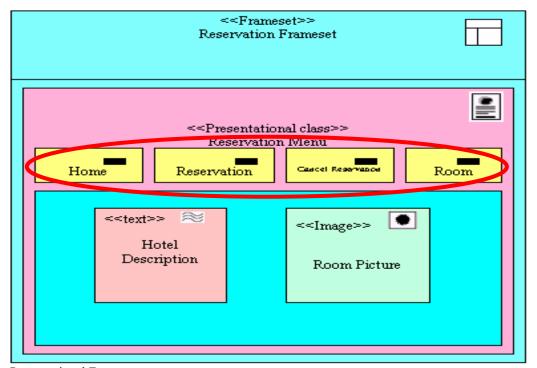
Figure 8: Presentational Frameset

CONCLUSION

After analyzing the design made for Online Hotel System, it can be concluded that UML extended is suitable for analyzing and designing web based application. It is because UML extended has successfully shows the navigation

and presentational aspects of Online Hotel System. In navigation aspect, UML extended include all notation needed for designing navigation structure. From stereotype navigation class to access primitives, it can be said that those entire notation fulfils the requirement of modeling web based application navigation structure.

Access primitive such as guided tour, query, menu and indexes that are used in navigation structure model has clearly shows us how web users can visit Online Hotel System. It is not only show the method for accessing the application from page to page but it also shows the entire possible paths that exist in the application. Designers and developers could use this navigation structure model to determine that users will not get lost once they are entering the web page. In other words, navigation structure model acts as a map to a web-based application. System maintenance will be easily done as all the information needed about navigation aspect of the system is documented.

For presentational aspect, the interface designed using UML extended is looks like the actual page of the Web-based application. This situation makes it easy for designer and developer to cooperate due the simplicity and easy to understand design. It helps both of them to communicate in the same language. This research also meet it objectives when researcher has successfully implemented part of the design of Online Hotel System in real world application. By showing the implementation of the design, researcher has proved that UML extended can be used to model Web-based application. UML extended can become one of alternative method considered when designers and developers were choosing a good method to model their Web-based application. UML extended is simple, easy to understand, expandable and provide a complete modeling element to model Web-based application. In addition UML is a standard notation for object-oriented methods.

In conclusion, UML extended is suitable to model Web-based application. With supported CASE tool and several enhancements, researcher believes that it will become such a good alternative method for designers of Web-based applications.

RECOMMENDATION

Although this research is considered as successfully meet it aims and objectives, there are still a lot of room for improvement. In this research, researcher has chosen the Online Hotel System as the case study. This system only uses several extended notations of presentational element. Modeling element such as audio and video are not included in the design. It is suggested that for the future study, case study used to model UML extended should include the entire extended elements. By doing so, the usage of those modeling elements can be shown clearly.

REFERENCES

Baumeister, H., Koch, N., & Mandel L. (1999). *Towards a UML extension for hypermedia design. In Proceedings «UML»'99, France, R., Rumpe, B. (Eds),* LNCS, Vol. 1723. Springer-Verlag, 614-629.
Booch G., Rumbaugh J., & Jacobson I. (1999). *The Unified Modeling Language: A User Guide.* Addison Wesley.
Conallen J. (1999). Building Web Applications with UML. Addison-Wesley.
Hennicker R., & Koch N.(2000). A UML-based methodology for hypermedia design. *In Proceedings UML200*0, LNCS, Springer-Verlag.
Hennicker R., & Koch N.(2001). Systematic Design of Web Applications with UML. *In Unified Modeling Language: Systems Analysis, Design and Development Issues.* Idea Group Publishing, 1-20.
Isakowitz T., Stohr E., & Balasubramanian P. (1995). A methodology for the design of structured hypermedia applications. *Communications of the ACM,* 8(38), 34-44.
Sauer S., & Engels G. (1999). *Extending UML for modeling of multimedia applications.* In Proceedings of the IEEE
Schwabe D., & Rossi G. (1998). *Developing hypermedia applications using OOHDM.* In Proceedings of Workshop on Hypermedia Development Process, Methods and Models, Hypertext´98.

Generating Corporate Dynamic Web Pages
Using Page Template Approach

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ABSTRACT

The dynamic nature of contents on the corporate Web has posted a serious problem to customers who need constantly to keep track of the latest updates and specific information. This paper describes an initial study of the utilizing template approach for maintaining and updating corporate Web pages. Template will ensure that all pages will get the latest data to be displayed and easier for updating page contents process done by the Web administrator. Unlike static HTML document, template will help Web administrator to change the contents of Web pages simply by just changing the template file. With the simplicity provided by the template, this research will therefore highlight the importance of templates to generate contents fragment for dynamic corporate Web pages. This study is then planned to evaluate the effectiveness of template approach after developing a prototype.

INTRODUCTION

World Wide Web or simply known as Web is becoming the most popular and rapidly growing technology within today's information system. Website is a complex communication medium (Farksas and Farkas, 2002) that encompasses a huge amount of unrestricted information and important for information dissemination all around the world.

Website serves many kinds of purpose varying from entertainment, informational to education and promotional. Alexander and Tate (1999) stated that there are eight basic types of Website purposes: personal, promotional, current, informational, persuasive, instructional, registration and entertainment. Thus, variety types of Website need to have variety types of contents to suit their different purposes. However, maintaining the Web contents for each Website type usually has not been done appropriately leaving the Web information with currency problem. Although HTML success with its simplicity supported with numbers of good tools, Web pages still not being update even though it should (Aycock and Levy, 1999). Treating the Web as a secondary medium would become one of the biggest mistake of Web management to the Website (Nielson, 1997).
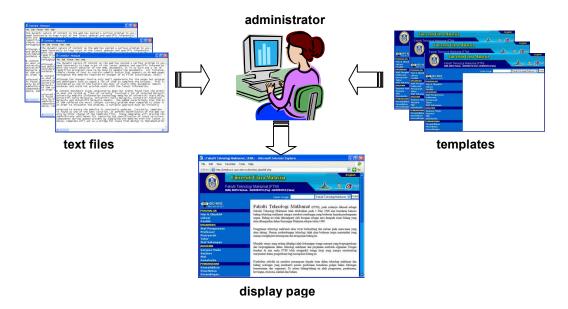
One of the main reasons the Web contents is not frequently updated is because of its static behaviour. Web has traditionally consisted of static files without functionality and without the ability to interact with other software resources (Evans et al., 1999). As a result, updating one Web page might require developers to change the whole structure of the Web page, causing the update activity is tedious and hard to handle.

As the Web matures, developers and programmers tried to seek for new techniques to encounter the static behaviour problem of HTML Web pages. Recently, dynamic Web contents that provides time-sensitive and continuously changing the data has gain prominence (Ko, et al., 2002). Examples of such sensitive pages that people commonly access include new stories and stock information. All of these pages will always be updated to ensure their respective readers get the latest information.

The technology that resides behind the dynamic pages is the templates (or page templates). The idea of templates is to separate the presentation logic from the application logic (Kristensen, 1998). By using templates, the HTML documents are stored separately from the program logic but they will contain special tags or placeholder. When the template processor encounters these tags at runtime, it will substitute it with the right (normally stored in the database system) data for that tags. After all tags are substituted, the pages will be sent back to the client to be displayed.

Template will ensure that all pages will get the latest data to be displayed. Unlike static HTML document, template will help Web administrator to change the contents of Web pages simply by just changing the template file. With the simplicity provided by the template, this research will therefore highlight the importance of templates to generate contents fragment for dynamic Web pages.

Figure 1: Template Approach

display page

WEB APPLICATIONS

The Web has become the platform of choices for presenting media-rich contents on-line and offline browsing. Web application seems to be so important in all aspects to deliver information. Most of the Web pages user interface often has the same functional elements such as historic, sequential navigation, contents full-text search and etc. The contents structure for most Web pages also exhibits regular structure (Nasir Al-Darwish, 2003). For this reason, it is clearly suggested that the HTML pages that are sent back to the client should utilize template documents.

Template based approach such as PreHypertext (PHP), Active Server Pages (ASP), Java Server Pages (JSP) and ColdFusion let developers write HTML text with special mark-up (tags). The special mark-up is substituted by the server at runtime, thus the new page is generated which composes contents dynamically into the template (Zdun, 2002). For this reason the three major Web application framework (server side scripting environments) in used today are all template-based: Microsoft's ASP, Open source's PHP and JavaSoft's JSP (Nasir Al-Darwish, 2003). ASP lets developers built a complete interactive Web pages or powerful Web based application with a good support from a variety of its product (Microsoft Corporation, 2003) while JSP also offers almost the same (Sun Micosystem Inc., 2003). PHP meanwhile attracts developers to use its technology to develop dynamic Web pages along with several open source application such as Apache (Web server) and MySQL (database) (The PHP Group, 2003).

While most old traditional HTML document combines presentation logic and application logic, template tries to separate them. Significantly, by separating this two hardcore, developers can gain three advantages (Kristensen, 1998). First, the HTML code can be modified without access to the application source code and without needing to recompile and retest the application. Second, HTML and application code can be edited with whatever tool that is most appropriate for each task. Third, localization is done on documents rather than on program code and is hence much easier. With much easier and fastest way to generate Web pages, template is therefore should be the best solution available nowadays to FIT Website problem.

PROBLEM STATEMENT

The dynamic nature of contents on the Web has posted a serious problem to users who need constantly to keep track of the latest updates and specific information. With the static behaviour of the HTML documents, it is so hard and a lot of repetitive processes have to be done to update the documents. For instance, simple change of text on certain submits button that appears on 46 Web pages throughout the Website required 46 changes of 46 files (Cunningham, 2001). Although the changes involve only small appearance for the pages but programmers and developers have to spend a lot of time to complete the process. This is considered as one of the factors why most of static HTML documents remain outdates and could not provide users with the latest information.

A contents benchmark study conducted by Been Hui (2003) found that the problem as what she called as "lack of currency" involved a lot of selected Malaysian University Website (Information Technology Website of Universiti Utara Malaysia, Universiti Sains Malaysia, Universiti Putra Malaysia, Universiti Teknologi Malaysia and Universiti Malaysia Sabah). This situation is surely not appropriate to a faculty which the root of its existence is to encourage the usage of information technology knowledge throughout the nation.

In order to encounter the problem, a suitable approach must be instantly selected to ensure the Website is constantly updated. Currently, template is found as one of the best solution. It permits modification of the Web contents only by minor change of the template file. These templates will provide the Web administrator with means for capturing the specification of reuse structure and components during update process by supplying the Website with the latest contents. Hence, template will act as a bridge for reuse from design to implementation process (Nanard, et al., 1998).

RESEARCH OBJECTIVES

Based on the problem statement mentioned, this research will have two objectives as follow:
i.   To migrate static HTML pages to dynamic by utilizing template approach.
ii.   To evaluate the efficiency of template approach for maintaining.

The above objectives are expected to be achieved through the methodology as explained in the next section.

RESEARCH SCOPE

This research will only highlight template approach capabilities to create dynamic Web pages. Despite the availability of other approaches such as *constructive approach* (Zdun, 2002), research interest will only be focused on template. This is due to the minimal level of complexity of template as compared to constructive approach in order to develop such pages. Template will ensure fast development of dynamic pages meanwhile making the updating process easy to conduct. This research will be conducted to utilize the template approach for migrating static pages of Faculty of Information Technology(FIT) at Universiti Utara Malaysia (UUM) to dynamic. Templates will ensure the ease of updating page contents process done by the Web administrator. The approach will be implemented for FIT's Website then the evaluation of its efficiency will be conducted.

METHODOLOGY

In order to ensure the success of this research, System Development Research Methodology from Nunamaker, Chen and Purdin (1991) is adapted. This methodology outlines five processes that should be taken to conduct a system development research. Figure 2 exhibits the respective processes. Activities involved in the each process are outlined in Table 1.

Figure 2: System Development Research Methodology Process
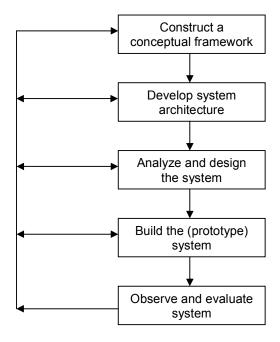
Table 1: Research Process And Activities Involved

Research Process	Activity Involved
Construct a conceptual framework	**Develop meaningful research question:** ■ How to utilize template in FIT Website? ■ How to evaluate the effectiveness of template for contents updating process in FIT Website?
Develop system architecture	**Define functionalities of system components and interrelation among them.** ■ Refer to Kristensen (1998) to understand how the template work
Analyze and design the system	**Define the schema and process to carry out system functions.** ■ Template schema will be based on PageGen created in Nasir Al-Darwish (2003)
Build the (prototype) system	**Learn about the concepts, framework and design through the system building process** ■ Template will be developed using FastTemplate 1.1.0 combined with PHP as the server side script. ■ MySQL will be used as the database system while Apache is the Web server.
Observe and evaluate system	**Evaluate the efficiency of the template approach.**

CONCLUSIONS

This paper describes an initial study of the utilizing template approach for maintaining and updating corporate Web pages. The outcome of this study is to highlight the importance of templates to generate contents fragment for dynamic corporate Web pages and to evaluate the efficiency of template approach.

REFERENCES

Alexander, J., & Tate, M. A. (1999). *Evaluating Web resources*. Retrieved November 10, 2003 from http://www2.widener.edu/WolfgranMemorialLibrary /Webevaluation/Webeval.htm.

Aycock, J., & Lary. M. (1999). *An Architecture for easy Web page updating*. Crossroad, 6(2), 15-18.

Been Hui, Y. (2003). *University Website Content Benchmarking: Evaluation and Improvement*. Master Dissertation, Information Technology Faculty, UUM.

Cunningham, B. (2001). *Web Development with PHP and FastTemplate 1.1.0*. Linux Journal, (86), 6.

Evans, M.P., Phippen, A.D., Mueller, G., Furnell, S.M., Sanders, P.W. & Reynolds, P.L. (1999). *Strategies for content migration on the World Wide Web*. Internet Research: Electronic Networking Applications and Policy, 9 (1), 25 – 34.

Farkas, D.K., & Farkas J. B. (2002). *Principle of Web Design*. New York: Longman.

Ko, I., Yoa, K. & Neches, R. (2002). Dynamic coordination of information management services for processing dynamic Web content. *Proceedings of the Eleventh International Conference on World Wide Web*. New York: ACM Press. pp. 355 – 365

Kristensen, A. (1998). *Template Resolution in XML/HTML*. Computer Networks & ISDN System, 30, 239-249.

Microsoft Corporation. (n.d). *Active Server Pages*. Retrieved November 13, 2003 from http://msdn.microsoft.com/library/default.asp?url=/nhp/default.asp?contentid=28000522.

Nanard, M., Nanard, J. & Kahn, P. (1998). Pushing Reuse in Hypermedia Design: Golden Rules, Design Pattern & Constructive Template. *Proceedings of the ninth ACM conference on Hypertext and hypermedia : links, objects, time and space*. New York: ACM Press. pp. 11-20.

Nasir Al-Darwish. (2003). *PageGen: An effective scheme for dynamic generation of Web pages*. Information and Software Technology, 45, 651-662.

Nielson, J. (1997). *Top Ten Mistakes of Web Management*. Retrieved November 10, 2003 from http://www.useit.com/alertbox/9706b.html.

Nunamaker, J., Chen, M. & Purdin, T. (1991). *System Development in Information System Research*. Journal of Management Information System, 7(3), 89-106.

Sun Microsystem Inc. (n.d). *Java Server Pages: Dynamically generated Web content*. Retrieved November13, 2003 from http://java .sun.com/products/jsp.

The PHP Group. (n.d). *What can PHP do*. Retrieved November 13, 2003 from http://www.php.net.

Zdun, U. (2002). Dynamically generating Web application fragments from page templates. *Proceedings of the 2002 ACM symposium on Applied computing*. New York: ACM Press. pp. 1113 – 1120.

Security in E-Commerce (In Term of Transaction)

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ABSTRACT

The Internet viewed as the combination of networks linked together, in order to provide interaction and services to its users. Internet encouraged cross platform of interaction among governments, businesses and local users. Businesses are primarily the main target of local users (customers) when dealing with services and purchasing goods and products. Therefore, it is considered as an opportunity for businesses to be involved on-line (E-Commerce), in order to gained profits, advantages and being one step ahead over their competitors. Today, many companies, out of necessity, are changing the way they involved in their daily business. Their business activities and communication methods are becoming more Internet-dependent. Here come the security issues regarding the transaction involved. Therefore, privacy and security of transaction should be a primary objective of the businesses to look forward into.
This paper would reports on security issues focusing on transaction involved regarding to the E-Commerce business practice. Indeed, it would also report on the overview regarding E-Commerce practice, its importance, and security issues as well as the Internet as whole.The purpose of this paper is to identify and acknowledge the threats faced by E-Commerce organizations, and analyzes various techniques and methods applied by businesses to ensure the security, reliability and efficiency of their E-Commerce transactions.

PROBLEM DESCRIPTION

Background of the Problem

With the advancement of technology in Internet and telecommunication fields, it brings a tremendous effect on the traditional business and marketing system. Internet has been strategically used as a market space where sellers and buyers exchange information, goods and services without the limitations of time and geographical constraints.

Nowadays, e-commerce has becomes the trend for most business organizations in order to gained more profits in their business. Besides, it also functions as a tool for competitive advantage compared to their competitors.

"The scope of e-commerce can be treated as being as narrow as 'electronic trading', or also board as 'electronic business'" (Mazleena Salleh, Liow Chong Wei, Tang Boon Leong, 2001).

According to Anup K. Ghosh (2001), E-Commerce occurs in five markets: business-to-consumer (B2C), business-to-business (B2B), consumer-to-consumer (C2C), business-to-government (B2G), and government-to-consumer (G2C). The similarities among these markets are that, they use website (Internet) as an intermediaries for conducting their business activities.

The main focus here is concerning the security aspect of these organizations, in implementing and ensuring the privacy and security of the transactions. This is considered as crucial for the success of e-commerce website, by ensuring their customers confidentiality towards their organizations. But, nevertheless there is still some real case situations in which critical information has been stolen and tampered in e-commerce transactions.

Thus, as a result this research is useful to identify the methods and protocols used in determining the practice of security in e-commerce transactions. However, we should consider that effective implementation is also important for our objectives to be achieved successfully.

RESEARCH ANALYSIS

Models of Security in E-Commerce Transactions

Specifically, any organization that involves in E-Commerce transactions should basically acknowledge and possesses a comprehensive generic security model of the computer network system. This is vital in terms of identifying various levels of network security, and applying appropriate techniques that suitable at each of its levels.

According to (Rolf Oppliger, 1999), there are many steps involved in securing a networked system, thus securing the E-Commerce transactions. He states that a generic security model for computer networks should take into account the following criteria's:

1. *Security Policy*
   Security policy mainly involves specifying the goals that would be achieved with regard to the security of the E-Commerce networked system.
2. *Host Security*
   Host security involves the issues on how to securely authenticate users, how to securely store and process data within a system, and how to manage effectively control access to system resources.
3. *Network Security*
   Network security concerns with how to efficiently control access to computer networks, and to securely transmit data between them.
4. *Organizational Security*
   Basically, organizational security includes instructions and directions that are stated to define legitimate human behavior.
5. *Legal Security*
   With the increasing automated attacks towards E-Commerce websites; it is possible to prosecute the attacker(s). This should be done after considering the huge damage and loss faced by E-Commerce merchants due to the attacks occurs.

RESEARCH FINDINGS

A total of 20 respondents that consists of E-Commerce organizations had agreed to participate in this research. The selected E-Commerce organizations were situated mostly in Selangor, Kuala Lumpur and Johor Bahru commercial area.

The E-Commerce organizations selected are as follows:-
1) ALMA MATAR TECHNOLOGY
2) ALTERA CORPORATION (M) SDN. BHD.
3) AMPTEK SALES AND DISTRIBUTIONS SDN. BHD.
4) ATE ADVANCED TECHNOLOGY
5) BRUNSFIELD CITYVIEW SDN. BHD.
6) COMMERCE TECHNOLOGY SDN. BHD.
7) CYBER - TECH IT CONSULTANTS SDN. BHD.
8) DIGITAL SOLUTIONS SDN. BHD.
9) E-COM VISION NETWORK SDN. BHD.
10) E-TECH IT SDN. BHD.
11) ELITE CONNECTIONS SDN. BHD.
12) IPRINT DIGITAL SDN. BHD.
13) LOTUS WEST SDN. BHD.
14) NEMOPHILIA SDN. BHD.
15) NUINFRA CONSOLIDATED SDN. BHD.
16) OGILVY AND MATHER SDN. BHD.
17) PRIMATEL SDN. BHD.
18) SKALI.NET
19) SOUTH IT SOLUTIONS SDN. BHD.
20) VISION NETWORK SDN. BHD.

From the Questionnaire session conducted, it is found that approximately 10 out of the E-Commerce (about 50 percent) involves in providing Secure Credit Card Processing services. This could be shown in Table 1 and Graph 1 below.
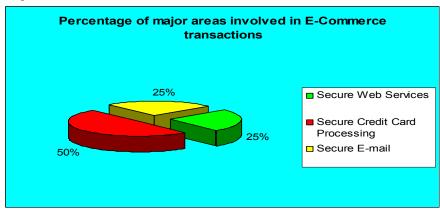
Table 1:

Major areas involved in E-Commerce transactions		
	Percentage (%)	Frequency
Secure Web Services	25	5
Secure Credit Card Processing	50	10
Secure E-mail	25	5
Total	100	20

This research found that most of the E-Commerce activities are comprised of three main E-Commerce activities:
1) Secure Credit Card Processing service.
2) Secure Web Services.
3) Secure E-mail Services.

Graph 1:

Meanwhile, approximately about 5 companies involved in providing Secure Web Services and Secure E-mail Services (respectively) to their clients. This reflects and shows that most of the E-Commerce organizations nowadays involved actively in financial transaction with their potential customers.

Therefore, this is considered as one of the key strength (distinctive competency) of major E-Commerce organizations nowadays. In addition, others activities such as Secure Web Services (example; Intranet in the organizations) and Secure E-mail services were also take into considerations as additional E-Commerce services to their customers.

Additionally, by analyzing data gathered during the Questionnaire session; this research also found that most of the Business Managers (on behalf of their company) believes that their E-Commerce websites secured. The percentage of Business Managers that agreed their E-Commerce websites secured comprise of 70 percent (about 14 out of 20 companies). This is shown in Table 2.

Table 2:
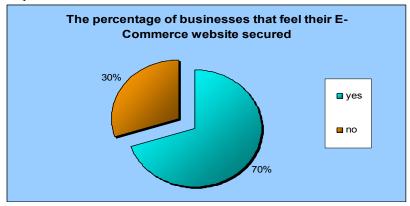
Percentage of businesses believes that their E-Commerce website secured		
Percentage	(%)	Frequency
Secured (YES)	70	14
Vulnerable to threats (NO)	30	6
Total	100	20

Meanwhile, about 30 percent (approximately 6 from the 20 companies) of the Business Managers have doubt regarding the security and reliability of their E-Commerce websites.

Analysis from the data gathered shows that surprisingly most of the Business Managers category that agreed their E-Commerce websites secured, involves in outsourcing their IT Department to the outsiders. Unfortunately, they also acknowledged in the Questionnaire that they face most penetration (attacks) cases on their E-Commerce websites compared to those managers who had IT Department functional area in their firm.

In addition, most of the Business Managers agreed that they outsourced their IT Department in order to reduce operational and overhead cost of the organization. This is considered unfortunate, since the IT Department is considered as vital in E-Commerce organizations. Graph 2 shows the percentage of the business that agreed their E-Commerce website secured.

Graph 2:

From the research and questionnaire session conducted, it was found that most of the E-Commerce organizations adapted several security techniques and measures in securing their E-Commerce website transactions.

Table 3 shows combinations of several security methods, frequency, and percentage of E-Commerce organizations adapting these security techniques. This table is derived and analyzed from the data gathered during the Questionnaire session conducted previously.
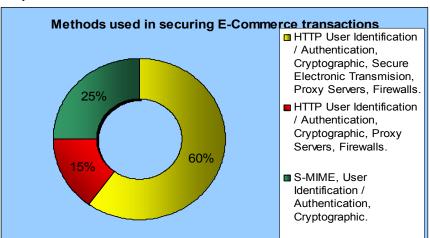
Table 3:

Methods used in securing E-Commerce transactions		
	Percentage (%)	Frequency
HTTP User Identification / Authentication, Cryptographic, Secure Electronic Transmission, Proxy Servers, Firewalls.	60	12
HTTP User Identification / Authentication, Cryptographic, Proxy Servers, Firewalls.	15	3
S-MIME, User Identification / Authentication, Cryptographic.	25	5
Total	100	20

Research also found that most of the E-Commerce organizations studied, have chosen combinations of HTTP User Identification / Authentication, Cryptographic, Secure Electronic Transmission, Proxy Servers, and Firewalls in securing their E-Commerce transactions. About 60 percent of the organizations (approximately 12 companies), agreed that they adapted these security techniques in their E-Commerce website applications.

Graph 3:

Additionally, it is analyzed that most of the companies adapted these security technologies as regard to their nature business environment. For examples, the organizations involves in financial transactions with their customers through their E-Commerce websites.

Meanwhile, approximately about 25 percent of the companies (5 organizations); adapted security protocol such as S-MIME, User Identification / Authentication, and Cryptographic technique. Mainly, these are the E-Commerce organizations that involved in providing Secure E-mail services to their clients.

Next, about three E-Commerce organizations studied (15 percent of overall samples); has acknowledged the practices of integrating E-Commerce security protocols consists of HTTP User Identification / Authentication, Cryptographic, Proxy Servers, and Firewalls; to secure their E-Commerce websites. Mainly, these are the organizations that involved in providing Secure Web Services to their respective clients.

FUTURE WORK

As from the research conducted, several constraints and suggestions has been identified and proposed to overcome the unforeseen consequences that exist. Despite of the constraints and problems that submerged in this research, hopefully this research could be improved in the near future work.

Further study need to be conducted extensively to ascertain other factors that determine the security of E-Commerce transactions. With regard to rapid growth in computer technologies nowadays, what is considered a new technology today would be absolutely obsolete in the near future.

Therefore, studies need to be conducted to identify new ways or factors to ensure the security and reliability of E-Commerce transactions (instead of depends only to hardware and software only).

For example, one of the areas suggested is in the Human Intellectual Management area. Basically, human intellectual is considered as bases and critical criteria for the success of E-Commerce organizations. The main reason is that human themselves create the technology and therefore considered as superior in terms of intellectual and capability to manage and solves problems.

In addition, one of the most threats faced by E-Commerce organizations is in terms of Social Engineering attacks by the attackers. Therefore, this supports the need to study on management of Human Intellectuals among key peoples in the organizations in ensuring the reliability of E-Commerce applications.

Recently, a new computer technology field has submerged and increasingly became popular among the computer experts. The field is known as Quantum Computer technology. Currently, Quantum Computer technology is considered as powerful in performing and handling large and difficult computer calculations and processes. Mainly, the technology is adapted in mainframe computers in large corporations, for example IBM.

Therefore, future research is needed to study on utilizing the Quantum Computer technology to be used in E-Commerce environments. Among the suggested areas would be in terms of securing the E-Commerce applications, databases and transactions. As a result, the applications and transactions would be more secure and reliable for both potential parties (customers and organizations).

CONSTRAINTS

From the research conducted, several constraints have been identified as regarding to the security of transactions in the E-Commerce organizations. From the questionnaire sessions conducted, it is identified that most of the business managers lack of information regarding E-Commerce security in their firms.

It is estimated that about 60 percent of the business managers (from the selected 20 organizations), does not have much information regarding the possible technologies adapted in securing E-Commerce business transactions. Instead, most of these business managers outsource their IT department to other companies in order to cut cost of the company operations. This is the main reason for lack of information regarding E-Commerce security among the business managers in the E-Commerce organizations.

In addition, most of the E-Commerce organizations (about 60 percent of the selected 20 firms) lack of IT personnel's that have expertise in the security areas of E-Commerce applications and transactions.

Majority of the firms involved in the research (about 60 percent) outsourced the security of their E-Commerce website to the external environment of the company. As a result, this creates other possible constraints as mentioned above. Nevertheless, the organizations have made a big mistake in outsourcing the most critical area in their organizations, for the sake of reducing the operational cost of their firm.

SUGGESTIONS

From the research conducted and constraints identified, several suggestions have been proposed to overcome several critical areas in securing transactions in E-Commerce organizations.
Basically, E-Commerce organizations should have their in-house IT Department and software developers. This is considered important to manage computer technology in the firms, and to developed, tested, and configure the correct E-Commerce software based on the nature of their business. Despite of outsourcing IT Department practices by the E-Commerce firms, they should acknowledge the possible consequences they may face, and potential benefits they may receive in future by having in-house IT Department.

Additionally, E-Commerce organizations should establish and developed a multilevel security for their E-Commerce website. In other words, E-Commerce organizations should developed a comprehensive multilevel security strategy in the Network level, Databases level and Application level as regard to securing their E-Commerce transactions.

E-Commerce organizations also should install and configured series combinations of correct software, and hardware to protect their E-Commerce systems. This is considered as important because the success of E-Commerce transactions lies between the correct coordination of hardware, software, and management skills that configured the E-Commerce systems.

CONCLUSION

In conclusion, the result from the field study found that most of the E-Commerce organizations applied combinations of several security techniques in securing their E-Commerce website. The adaptations of the security techniques and measures involves are determined by the nature of E-Commerce business of the organizations.

E-Commerce organizations should avoid business practices of outsourcing their functional critical areas (such as IT Department) that determine the success of their E-Commerce business. The reason to reduce overall firm operational cost should be reconsider and offset to the importance of security and reliability of E-Commerce transactions and applications. This is vital in order to build a good image and trust relationship among the businesses and their respective customers.

Besides, the framework development of security in E-Commerce transactions should be a continuous process among the E-Commerce expert personnel's. As time flies, the future of E-Commerce matrix businesses would be more complex and challenging; considering the increasing threats from viruses and Crackers. Thus, any technology that is considered new today would be obsolete in the near future.

REFERENCES

Ahmad Faiz (October 2002), "Dare To Spend Online-Guide To E-Transactions", Issue #96, Computimes Shopper Malaysia.

Anup K. Ghosh (2001), "E-Commerce Security and Privacy", Kluwer Academic Publishers.

Anup K. Ghosh (2001), "Security & Privacy for E-Business", Wiley Computer Publishing.

Anonymous (1998), "Maximum Security: A Hacker's Guide to Protecting Your Internet Site and Network", Second Edition, Sams Publishing.

C. Ranganathan, Elizabeth Granon (2002), "An Exploratory of Factor Affecting Online Sales", Journal of Computer Information Systems. Vol. (42). Number 3.

Charles P. Pfleeger (1979), "Security in Computing", Prentice-Hall International, Inc.

Comer, Douglas (2000), "The Internet Book", Prentice-Hall Inc.

Debra Cameron (2000), "Reengineering Business for Success in the Internet Age", Computer Technology Research Corporation.

Edward G. Amoroso (1994), "Fundamentals of Computer Security Technology", PTR Prentice Hall.

Hellriegel, Jackson & Slocum (1999), "Management (Eight Editions)" International Thomson Publihing.

James Brancheau, Shi Nansi (2001), "Essential Technologies for E-Commerce: Developing Professional Web Applications", Prentice-Hall Inc.

Jonathan S. Held, John R. Bowers (2001), "Securing E – Business Applications and Communications", Auerbach Publications, [Online] Available at: http://www.auerbach-publications.com/.

Mazleena Salleh, Liow chong Wei, Tang Boon Leong (2001), "The Development of Price-Wise E-Commerce Enabled Web Site", Journal of Information Technology UTM. Vol. (13). Number 2.

Mostafa Hashem Sherif (2000), "Protocols for Secure Electronic Commerce", CRC Press LLC.

Peterson, R., Balasubramaniam, S., & Bronnerberg, B. J. (1997). "Exploring the implication of the Internet for consumer marketing", Journal of the Academy of Marketing science. Vol. 25(4), pp.329-346.

Ridzwan A. Rahim, Siti Syameen Md Khalil (October 2002), "Getting Acquainted With Online Banking", Issue #96, Computimes Shopper Malaysia.

Robert Bond (2002), "Navigating Security and Legal issues in Digital Business", John Wiley & Sons, Ltd.

Rolf Oppliger (2000), "Security Technologies for the World Wide Web", Artech House publications.

Shahibudin Laming (1996), "Man And Community In The Qur'an", A. S Noordeen Publications.

Thomas Connolly, Carolyn Begg (2002), "Database Systems: A Practical Approach to Design, Implementation, and Management", Addison Wesleys.

Timothy Braithwaite (2002), "Securing E-Business Systems: A Guide for Managers and Executives", John Wiley & Sons, Inc.

Wang, F., Head, M., Archer N. (2002), "E- Tailing: An Analysis of Web Impacts on the Retail Market", Journal of Business Strategies. Vol. (19). Number 1.

Warwick Ford, Michael S. Baum (2001), "Secure Electronic Commerce: Building the Infrastructure for Digital Signatures and Encryption", Second Edition, PTR Prentice Hall.

Journal Of Chief Information Officer (CIO), [Online] Available at: http://www.cio.com/research/ec/

CITIBANK Website, [Online] Available at: http://www.citibank.com.my

MAYBANK ONLINE BANKING SERVICES, [Online] Available at: http://www.maybank2u.com.my

International Security Buletin Issues, [Online] Available at:
http://www.home.tampabay.rr.com/pfingar/ch8cNetVaiWorld/cNetch8Body.htm

Investor Communication and the Internet:
The Case of Public Listed Companies in Malaysia

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ABSTRACT

The purpose of conducting this research is to examine the extent of the use of Internet by listed companies in the Kuala Lumpur Stock Exchange, as a method of communicating corporate information to the investors. In other words, are the companies taking their own initiatives to list their own corporate information announcements in their websites. The result of the research shows that most of the companies are not taking their own initiatives to list their own corporate information announcements. Apart from that, most of the companies do not have websites. Furthermore ,it was found that there's significant association between KLSE listing position of company and industry type of company with the availability of company website to list announcements(whether company has not website, company has website but does not list announcements and company has website and does list announcements). However, there's no significant association between category of number of company shareholders with availability of company website to list announcements.
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INTRODUCTION

An organisation, whether it is publicly listed or not, operates in a dynamic environment that consists of various stakeholders such as workers, suppliers, shareholders and also the general public . As such, it is very important for organizations to interact and have investor communication activities to inform the stakeholders and the public as a whole about the things that is going on in the organizations. The issue of investor relation (IR) and investor communication is of importance to the listed companies as they are required by the Securities Commission of Malaysia to disclose certain information to the public.

The print media such as newspapers have traditionally been the most popular method of disclosing such information. However, due the expansion and the explosion of the technological world, companies can now make use of the Internet. The Internet has indeed played a vital role in today's local and global business worlds. With the Internet, it is now easier for organizations to communicate information to their investors and stock market as a whole. The advantages of the Internet has made it a useful tool for   the process of investor communication. According to Pincus (as cited in 'News features', 2000), the adoption of such technology has made the process of investor communication more efficient. Here, the Internet is able to bring all the investors together, whether they are individual or institutional investors. Apart from that , one must also be aware that the efficiency of communicating information to the investors is an important asset . Corporate information announcements such as annual report announcement and material information can be easily posted on a company's website which is accessible by the investors on a 24 hours basis.

Thus, by looking at the potential of the Internet, the KLSE introduced a network known as KLSE Link . This link will enable listed companies to electronically file their announcements on the KLSE website. This will enable corporate information to be communicated to the investors and be used for future references.

However, the issue here is whether the listed companies in Malaysia are making use of the internet as in the case of their respective websites to enhance their investor communication.

LITERATURE REVIEW

Requirements for the Communication of Corporate Information

According to the Listing Requirements of the KLSE, the process of continuing disclosure can ensure a credible and responsible market whereby the participants will conduct themselves in the highest standard of due diligence and investors will have access to timely and accurate information that can be used to evaluate the

securities. This will also promote accountability and transparency of an organization. Such elements are important for good Corporate Governance.

According to Wetuski(2000), the US Securities and Exchange wants corporate to treat their myriad investors as equals and a new rule has been approved to require that management must disseminate material information to all shareholders and analyst at the same time. As such , the immediate communication of material information is important for levelling the playing field for all the investors. Apart from that, this will also prevent insider trading and manipulations of company shares by certain parties.

KLSE Listing Information Network (KLSE LINK)

KLSE LINK is a network connecting public listed companies(PLC), merchant banks and external company secretaries to KLSE for the purpose of corporate disclosure and information exchange. The objective of KLSE LINK is to facilitate greater corporate disclosure. With this link, the KLSE is able to:
a)   provide an infrastructure that will enable announcements to be submitted securely and efficiently by the PLC, merchant banks and external company secretaries, to KLSE;
b)   provide the market with timely access to announcements;
c)   provide the market with easy access to, and retrieval of announcements.

With this link, KLSE can ensure that:
a)   the time involved between the submission and dissemination of announcements will be greatly reduced (i.e. shorter turnaround time);
b)   the announcements will be disclosed in a more timely fashion and to a wider audience

The information available on KLSE LINK comprises of all types of corporate information meant for public disclosure. They are:
a)   PLCs' announcements (entitlements, financial results, changes to corporate and shareholding information, share buy-backs, etc).
b)   Documents such as circulars to shareholders, introductory circulars, prospectuses, etc.

The KLSE is actually using the Internet to communicate corporate information announcements to the investors with the KLSE LINK. However, in order to enhance investor communication, the PLCs can also list their own corporate information in their respective websites.

Growth of Internet and Investor Communication.

The growth of internet in the Malaysian is becoming a national phenomenon. According to Lee (2000) , the Internet was ranked number one in the top ten IT growth areas in Malaysia, in 1999. Furthermore, according to Abdullah, the Executive Chairman of Multimedia Development Corporation (as cited in Legard, 2000), the number of Internet users in Malaysia is expected to increase in between 6 to 7 million by the end of this year. As such, Malaysia will register about 1.4 million internet subscribers by the end of year 2000. Apart from that it is also estimated that Malaysia will have 3.14 million Internet subscribers by year 2004.

Apart from that according to Tan (as cited in Legard, 2000), the level of e-commerce is also increasing in Malaysia. It is estimated that total revenue from e-commerce activities in this country was estimated to be RM187 million in 1999. This figure is expected to reach RM6 billion by the year 2003.

However, Chin (as cited in Lee, 2000) pointed out that despite the rosy picture, the internet penetration rate in Malaysia was only 6 % in the year 1999. Apart from that, the editor of Jaring Internet Magazine cited that the growth rates in e-commerce in Malaysia is considered low as compared with countries like Hong Kong and South Korea (as cited in 'Baby steps', 2000). It can be characterized as a baby industry. However, many Malaysians are adamant that the nation's Internet industry can leapfrog their counterparts.

The above figures do show that the Internet has the potential to become a good communication tool in this country. In a developed country such as United States, the Internet is used to enhance the process of investor communication.

In the United States, the new rule from the Securities Commission requires that news that could affect a company's stock should be communicated to all the investors. As such, according to Bradway (as cited in Trombly, 2000), technology such as the Internet and wireless application can play an important role in the

distribution of disclosable data and information. It will significantly increase the amount of communication to the investment community . Apart from the traditional media such as newspapers, the internet can also provide for a broad cast(mass communication) medium for corporate reports(Parker, 1982).

According to Wertheim (2000), the Internet has allowed organizations to make timely disclosures to the investors. There is a growing number of companies that are webcasting their conference calls, annual meeting and other investor presentations. By doing so, it would be easier for individual investors to obtain information from the organization.As such, the Internet can ensure that a full, timely and broad disclosure be done. Corporate information can also be made available to everyone from anywhere, for 24 hours a day.

In relation to the disclosure issue, Noonan(as cited in 'News features',2000) stated that one of the main issue that listed company looks at , when hiring an investor relation consultant is whether the IR consultant can reach its client's target audience with technology. As such, many IR firms are currently leading their customers into the Internet, in order to make investor communication more efficient.

According to Waryjas and Thompson Jr. (2000), revolutions in the communications and information technology have made it easier for companies to disseminate information broadly. Apart from that, it must be duly noted that the Internet's empowerment of individual investor and the investors' demands for real time access to information, are the driving forces behind the changes in company disclosure practices.

From the discussion above, it is clear that the Internet does play an important role for the communication of corporate information announcements to the investors. Among the characteristics of the Internet that made it into an efficient communication tool are:
a)   Easily accessible from anywhere around the world.
b)   Available 24 hours a day.
c)   Fast transmission of message.

Companies and Disclosure of Corporate Information

The issue of disclosure of corporate information seems to be a popular subject as there are several researches being done on the issue. The researches conducted have often tried to link the disclosure of corporate information whether it is financial or non financial information to the organisations' size, industry types and so forth.

One such research was conducted by Wildstrom(1997) based on 50 US organizations listed in the Business Week. Here, 94% of the companies had websites. However, only 28 companies provided complete annual report. It is also found that high technology companies were generally the highest group of companies using the internet to provide corporate information.

 A research conducted by Craven and Marston(1999) on top 200 UK companies showed that larger companies (in terms of turnover and capital employed) were more likely to disclose their information on their websites. However, the industrial classification did not seem to be significant. Apart from that , the survey on FTSE 100 companies in UK in 1996, showed that 63% of the companies had websites (Marston & Leow,1998). Only 45 companies disclosed their financial information on their websites. Apart from that, it was found that tests of relationship between industrial type and financial disclosures showed no significant results. However, there was a relationship between company size(in terms of turnover and capital employed) and the disclosure of financial information. Larger size companies are more likely to disclose financial information.

A research conducted based on Japanese companies showed that internet reporting was well established among leading Japanese companies.(Marston, 2003) There were also some evidence to show that company size and industry type but not profitability or oversea listing were associated with website status(whether there was no website, a Japanese-only website and or English version).

Apart from researches being conducted in a single country, there were also researches about the issue that were conducted using companies from than one country.

The research conducted by Deller, Stubenrath and Weber(1999) on the investor relations activities of US, UK and German corporations showed that most of the companies in the 3 countries have websites. They found that it was more common in the US for organizations to conduct investor relations through the Internet than the other two countries. The analysis of top 100 Fortune Global companies by Flynn and Gowthorpe(as cited in Marston, 2003) showed that 89% of the companies have websites. 71% of the companies with websites had made their

annual reports available in their websites. Analysis of the websites also showed that US companies were found to be most open and informative as compared to German and Japanese companies.

From the results above it is very clear that not every company whether they are publicly listed or not, will have their own websites to list their corporate information announcements. As such, in terms of availability of company website to list their announcements; companies can be classified into 3 categories which are:
i.   companies which do not have their own websites.
ii.   companies which have their own websites but do not list their announcements. iii.companies which have websites and do list their own announcements in their websites.

RESEARCH PROBLEM STATEMENT

From the discussion above, it is very clear that the Internet is a tool that can be used to communicate corporate information announcements to the stakeholders of the company. However, the problem here is to what extent are the listed companies in the KLSE are taking their own initiatives by making use of their own websites to communicate their corporate information announcements.

RESEARCH OBJECTIVE

The main objective of this exploratory research is to examine the extent of the use of Internet (as in the case of their own websites) by listed companies, as a method of communicating corporate information to the investors. In other words, are the companies taking their own initiatives to list their own corporate information announcements in their respective websites. Apart from that, the researcher would also like to determine if there's any association between availability of company website and industry type, listing positions and number of shareholders of organisations.

RESEARCH METHOD

Sampling

The samples of this research consisted of PLCs that made corporate information announcements in the KLSE website from the month of January to March of the year 2001. The operational definition of corporate information is the same as the one that was given by KLSE, that was discussed earlier on. As such, the corporate information announcements will include financial and non financial information.

Data Gathering Method

By using the KLSE website as the source of corporate information announcements, the researcher then traced the listed information to the websites of the respective companies; in order to see whether they are listed in the companies' websites. The locations of the companies' websites were traced by using the Yahoo and Netscape search engines.

The industry type and KLSE listing position(1st and 2nd board) of the companies were obtained from the company profile section in the KLSE websites. In order to be listed in the 1st board of KLSE, a company will need to have a minimum paid up capital of RM50 million. As for the second board, a minimum paid up capital of RM10 million but less than RM50 million is required. In terms of that, it can be concluded that the company size of 1st board companies are larger than the companies in the 2nd board. Finally, the number of shareholders for the companies were obtained from the annual reports that were available in the KLSE website. The figure of number of shareholders were based on the year 2001.

Research Questions

The research questions are as follows :

i.   What is the total number of corporate information announcements made by the PLCs in the KLSE website from the month of January to March in the year 2001?
ii.   What are the types of corporate information announcements that are listed/not listed by the companies' own initiatives?.

iii.   Is there any association between the industry type of company and availability of company website to list announcements(companies with no websites, companies with websites but do not list, company with websites and do list)?

iv.   Is there any association between the size of company shareholders and availability of company website to list announcements?

v.   Is there any association between the KLSE Listing Position and availability of company website to list announcements?

The data collected to answer the above questions were analysed using descriptive statistics and Chi Square Independent Tests.The significant level set for this research is 5% or 0.05. The software used for the analysis was SPSS (version 11.5).Apart from that, three sets of hypothesis in relation to questions iii, iv and v were created to be tested and they can be seen in the results section of this research. The purpose of putting them in that section is to make it easier for people to refer to them when they are looking at the results.

RESULTS

Types of Announcements

Table 1 lists all the corporate information announcements made by the organisations between January and March 2001.Apart from that, table 2 and 3 are subset tables of table 1, each respectively showing the types of announcements listed and not listed by the companies that made those announcements. As such, the total of table 2 and 3 will add up to become the total of table 1.

The total number of corporate information announcements made between January and March of 2001 that were listed in the KLSE website is 14,146. From the table 1, it is very obvious that category of announcement related to the changes in substantial shareholder's interest in the organization, has the highest number; with 7,498. It consists of 53% of all the announcements made between January and March of 2001. The second category on the list is changes in director's interest in the company. However, there's a wide gap between the first and second category. The second category consists of only 9.53% of all the announcements made. The third highest category is changes in board of directors and administrative committees with 6.12% and the company's share buyback category is forth with 4.52%.

Apart from that, among some of the other corporate information announcements made during the period are about the company's debt restructuring, company's employee share option scheme, notice of company's agm and legal action taken against the company.

However, from the total amount of 14,146, only 687 or 4.86% of the announcements are listed on the websites of the companies involved in making those announcements. This figure shows that there is a large amount of information that is lost and companies are not taking their own initiative to enhance their investor relations communication by using websites.

Of the 687 announcements listed on the company websites, 44.83% of them are related to changes in substantial shareholders interest in the company; thus making it the highest category in the list(Table 2). This is not surprising because it has the highest frequency in the total amount of announcements listed in the KLSE website. Second on the list is announcement related to company's share buy back scheme. Changes in director's interest in company and company's employee share option scheme are both tied in the third place of the list. Both of them have 7.28%. Among some of the other announcements which were listed in the company's websites are notice of company's egm, company acquiring equity interest of another company and company acquiring projects.

Next, Table 3 lists the types of announcements that were not listed by the companies' own initiatives; irrespective of whether the companies have websites or not. Topping the list is changes in substantial shareholders' interest in company, which takes up about 7,190 or 53.42% of all the announcements not listed. Second on the list is changes in director's interest in company with 9.64% of 13,459 announcements not listed. Changes in board of directors and administrative committees is third on the list with 6.14%. Others on the list are company's share buy back scheme, legal action taken against company's subsidiary and notice of company's agm.

Before proceeding further, it is important to note that the information about industry type, KLSE listing position and number of shareholders were not obtainable for 8 of the 754 companies which made the corporate information announcements in the KLSE LINK. This is due to the fact that the 8 companies have either merged

with other companies or they have been taken over by other companies. As such, the category not available was created to accommodate this situation.

Availability of Company Website To List Corporate Information Announcements

The total number of companies which were involved in making the corporate information announcements between January to March 2001 is 754. However, most of the companies which made the announcements do not have their own company websites. The number of companies which do not have websites is 541 or 71.8% of 754 (Table 4). Apart from that, 22.8% of the companies do have their own websites but do not list their announcements in their websites. Finally, only 5.4% or 41 companies have their own websites and list their announcements in their own websites.

Availability of Company Website and Industry Type of Company

Of the 172 companies which have websites but do not list their announcements on their websites, 26.2% of them are listed in the trading/Services sector of KLSE (Table 6). Apart from that, 25.6% are in the industrial product sector and 14% are in the consumer product sector. Finally, none of them are listed in the trust fund and closed end fund sectors.

Meanwhile, 29.6% of companies which do not have websites are listed in the industrial product sector. The second on the list is the trading/service sector with 16.8%.Third on the list is consumer products with 15.3%.

Finally, most of the companies which have websites and did list their announcements in their own websites are in the industrial product and trading/services sectors. Both of them equally share the total of 44.0% of 41 companies. Apart from that, 12.2% of the companies are in the consumer product and finance sectors. Finally, none of the companies are listed in the mining, trust, closed ended fund and hotel sectors.

Availability of Company Website and KLSE Listing Position of Company

Table 5 shows that 63.8% of the companies which made the announcements are listed on the first board and 35.1% of them are listed on the second board. 69.8% of the companies which do have websites but do not list their announcements are listed on the first board of the KLSE. On the other hand,30.2% are listed on the second board. Meanwhile, 60.8% of the companies which do not have websites are listed on the first board and 37.7% are listed on the second board. Finally, only 22% of the companies which have websites and list their announcements are listed on the second board. The rest of them, which is about 78%, are listed on the first board.

Availability of Company Websites and Number of Company Shareholders

Table 7 shows the descriptive results of the number of company shareholders and category of availability of company websites.The mean number of shareholders is 9636.57. The highest number of shareholders that a company has is 143,901 and the lowest number of shareholder that a company has is 1. Both of the figures belong to companies which do not have websites. In term of numbers, it would seem that the companies with websites and list their own announcements have the highest mean of shareholders. Their mean is 13,174.39. The second on the list is the category of companies with websites but does not list the own announcements, with 10,018.75. Finally, the companies without websites have the lowest mean of 9,241.11

In order to show a more detailed scenario of the number of company shareholders and category of availability of company website, the list of shareholders are categorized into the categories that can be seen in Table 8. Table 8 shows that 51.7% of the companies which have websites but are not listing their announcement in them; have 4,000 or less shareholders in the companies. However, about 29 or 16.9% of them falls into the range of 4,001 to 8,000 shareholders. Apart from that, 10.5% of those companies have between 8,001 to 12,000 shareholders in their respective companies. Finally, there are about 5.8% of such companies which have more than 40,000 shareholders.

Meanwhile, about 48.4% of the companies which do not have websites, have 4,000 or less shareholders in their companies. Furthermore, about 18.7% or 101 of those companies have between 4,001 to 8,000 shareholders in their companies. The number

of such companies that has the range of 8,001-12,000 is 51. Finally, only 3.1% of such companies have more than 40,000 shareholders in their companies.

As for the 41 companies which have websites and listed their announcements; 36.6% of them have 4,000 or less shareholders in their organizations. Apart from that,17.1% of them fall into the range of 4,001 to 8,000 shareholders. The number of companies which have the range of 12,001 to 16,000 shareholders is 4. Finally,7.3% of such companies have more than 40,000 shareholders in their respective companies.

Association Between Industry Type of Company and Availability of Company Website

The null and alternate hypothesis for these variables are as follow:
H1o: There is no association between industry type of Company and the availability of company website.
H1a: There is an association between industry type of company and the availability of company website .

Table 9 shows that the Chi Square Value is significant, therefore H1a is supported, meaning that there's a significant association between the industry type of company and the availability of company website. According to Ticehurst and Veal (1999), the chi square result will not be reliable if there are more than one fifth of the cells of the table with 'expected frequencies" of less than 5,and none with an expected frequency of less than 1. However, if this rule is broken, the significance level reported for the Likelihood Ratio should be used instead of the Pearson Chi-Square(Cavana, Delahaye and Sekaran, 2001). In this case, the Likelihood Ratio Value is still significant. As such, companies which do not have websites to list their announcements are likely to be from the Industrial Product sector.

Association Between KLSE Listing Position of Company and Availability of Company Website.

The null and alternate hypothesis are as follows:
H2o: There is no association between type of board in KLSE and the availability of company website.
H2a: There is an association between type of board in KLSE and the availability of company website.

Table 10 shows that the Chi Square Value is significant, therefore H2a is supported, meaning that there's a significant association between the type of board in KLSE and the availability of company website. However, due to the problem of 22.2% of the cells have expected count less than 5, the significance level of Likelihood Ratio is used. In this case, the Likelihood Ratio Value is still significant. Therefore, H2a is still supported. From table 5, it is possible to see that companies which do not have websites to list their announcements are likely to be from the first board of KLSE

Association Between Category of Number of Company Shareholders and Availability of Company Website

The null and alternate hypothesis are as follow:
H3o: There is no association between category of number of company shareholders and the availability of company website.
H3a: There is an association between category of number of company shareholders and the availability of company website.

Table 11 shows that the Chi Square Value is insignificant, therefore H3o is not rejected, meaning that there's no significant association between type of board in KLSE and the availability of company website. However, due to the problem of 22.2% of the cells have expected count less than 5, the significance level of Likelihood Ratio is used. In this case, the Likelihood Ratio Value is also insignificant. As such, the above result still stands.

SUMMARY OF RESULTS AND DISCUSSION

The above results show that announcements related to the changes in substantial shareholders interest in the company is the most frequently made during January to March 2001. As such ,it is also not surprising to find out that it is also the highest in the list of announcement listed by the companies' own initiatives and also the highest on the list of announcements not listed by the companies' own initiatives.

Apart from that, most of them do not have websites to list their own announcements.

That's why most of the announcements listed on the KLSE websites are lost and not listed by the respective companies. This result is in contrast with most of the previous researches conducted where the percentages of companies with websites are higher than the percentages of companies without websites.

The results also show that there's significant association between availability of company website and industry type of company in KLSE. This result supports the result of the research conducted by Marston (2003) which showed that there's an association between industry type and website status. However, this result does not support the result found by Craven and Marston (1999) which showed that there's no significant association between industrial classification and whether companies disclose their information on their websites.

 From the results of this research, it can be seen that there is a significant association between the availability of company website and KLSE listing position of company .
Since the listing position of the 1st and 2nd board can be seen as a measurements of company size, this result also supports the result of the research conducted by Marston (2003),which showed that there's an association between company size and website status. The results of this research also show that there's no significant association between the availability of company website and category of number of company shareholders.

RECOMMENDATION FOR FUTURE RESEARCH

The results of this preliminary research can be used to highlight some of the issues that can be undertaken by future researches in relation to the topic of corporate reporting through the usage of company websites. The first issue that can be explored is the reasons why listed companies are not using websites to communicate their corporate announcements to the public or to enhance their investor relations. Apart from that, future researches can also be done to identify the factors that can encourage them to use the websites to communicate their corporate announcements. Apart from that, future research can also look at the reasons why some companies are making use of their websites to communicate their corporate announcements to the public.

Table 1: Types of Corporate Information Announcements Made by Listed Companies Between January to March 2001

Types of Announcements	Frequency	Percent
Changes in Substantial Shareholder's Interest in Company	7,498	53.00
Changes in Director's Interest in Company	1,348	9.53
Changes in Board of Directors and Administrative Committees	866	6.12
Company's Share Buy Back Scheme	639	4.52
Company's Employee Share Option Scheme	399	2.82
Company acquiring Equity Interest of Another Company	336	2.38
Company's Debt Restructuring	198	1.40
Rights Issue of Company's Share	130	0.92
Company's Disposal of Equity Interest of Another Company	121	0.86
Company Acquiring Projects	113	0.80
Company's Monthly Production Figures	111	0.78
Legal Action taken against Company's Subsidiary	110	0.78
Notice of Company's Agm	94	0.66
Legal Action Taken Against Company	83	0.59
Bonus Issue of Company Share	82	0.58
Others	2018	14.27
Total	14146	100.00

Table 2: Types of Corporate Information Announcements That Were Listed on Company Websites

Types of Announcements	Frequency	Percent
Changes in Substantial Shareholder's Interest in Company	308	44.83
Company's Share Buy Back Scheme	54	7.86
Changes in Director's Interest in Company	50	7.28
Company's Employee Share Option Scheme	50	7.28
Changes in Board of Directors and Administrative Committees	39	5.68
Company Acquiring Equity Interest of Another Company	30	4.37
Company's Disposal of Equity Interest of another company	13	1.89
Notice of Company's Egm	11	1.60
Company's Monthly Production Figures	9	1.31
Suspension of Trading of Company Share	7	1.02
Maturity and Redemption of Company Bond	7	1.02
Company Acquiring Projects	6	0.87
Exercise of Company Warrant	6	0.87
Rights Issue of Company Share	5	0.73
Increase in Capital of Company	5	0.73
Resumption of Trading Of Company's Share	5	0.73
Company's Group Restructuring	5	0.73
Default in Payment of Loan by Company's Subsidiary	5	0.73
Dissolving Company's Subsidiary	4	0.58
Company Having Collaboration and Strategic Alliance	4	0.58
Voluntary Winding Up of Company's Subsidiary	4	0.58
Others	60	8.73
Total	687	100.00

Table 3: Types of Corporate Information Announcements Not Listed By The Companies' Own Initiatives

Types of Announcements	Frequency	Percent
Changes in Substantial Shareholder's Interest in Company	7,190	53.42
Changes in Director's Interest in Company	1,298	9.64
Changes in Board of Directors and Administrative Committees	827	6.14
Company's Share Buy Back Scheme	585	4.35
Company's Employee Share Option Scheme	349	2.59
Company Acquiring Equity Interest of Another Company	306	2.27
Company Debt Restructuring	196	1.46
Rights Issue of Company Share	125	0.93
Legal Action Taken Against Company's Subsidiary	110	0.82
Company's Disposal of Equity Interest of another company	108	0.80
Company Acquiring Projects	107	0.80
Company's Monthly Production Figures	102	0.76
Notice of Company's Agm	92	0.68
Legal Action Taken Against Company	83	0.62
Bonus Issue of Company Share	80	0.59
Others	1901	14.12
Total	13459	100.00

Table 4: Availabilty of Company Website to List Corporate Information Announcements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes but no	172	22.8	22.8	22.8
	no web	541	71.8	71.8	94.6
	yes got	41	5.4	5.4	100.0
	Total	754	100.0	100.0	

Table 5: Crosstabulation Results Between KLSE Listing Position of Company and Availability of Company Website

			Board in KLSE			Total
			First board	Second board	Not available	
Web site	yes but no	Count	120	52	0	172
		% within website	69.8%	30.2%	.0%	100.0%
	no web	Count	329	204	8	541
		% within website	60.8%	37.7%	1.5%	100.0%
	yes got	Count	32	9	0	41
		% within website	78.0%	22.0%	.0%	100.0%
Total		Count	481	265	8	754
		% within website	63.8%	35.1%	1.1%	100.0%

Table 6: Crosstabulation Results Between Industry Type of Company and Availability of Company Website

Website*Sector in KLSE Crosstabulation

			sector														
			cons prod	planta	mini	tru	clos end	not	indus prod	constr	tradin rvic	infrastr	fina	techno	hot	prope	Tot
web	yes	Co	2	1	1	0	0	0	4	1	4	2	1	7	2	1	17
		% within	14.	.6	.6	.0	.0	.0	25.	5.8	26.	1.2	10.	4.1	1.2	10.	100.
	no	Co	8	3	5	4	1	8	16	5	9	3	3	7	4	5	54
		% within	15.	6.1	.9	.7	.2	1.5	29.	9.2	16.	.6	6.7	1.3	.7	10.	100.
	yes	Co	5	5	0	0	0	0	9	3	9	1	5	2	0	2	4
		% within	12.	12.	.0	.0	.0	.0	22.	7.3	22.	2.4	12.	4.9	.0	4.9	100.
Tot		Co	11	3	6	4	1	8	21	6	14	6	5	1	6	7	75
		% within	14.	5.2	.8	.5	.1	1.1	28.	8.4	19.	.8	7.8	2.1	.8	10.	100.

Table 7: Descriptive Results for Number of Company Shareholders and Availability of Company Website

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Yes but no	172	10018.7500	15776.23993	1202.92702	7644.2515	12393.2485	697.00	91409.00
No web	533	9241.1051	13830.72935	599.07539	8064.2615	10417.9486	1.00	143901.00
Yes got	41	13174.3902	15810.61244	2469.20282	8183.9452	18164.8353	543.00	66834.00
Total	746	9636.5737	14421.58131	528.01161	8600.0060	10673.1415	1.00	143901.00

Table 8: Crosstabulation Results Between Categories of Number of Company Shareholders and Availability of Company Website

Website*Cate of Shareholders Crosstabulation

			cate of												T
			1-	400	8001	1200	1600	2000	2400	2800	3200	3600	>4	not	
we	yes	C	8	2	1	1	6	2	1	3	1	3	1	0	1
		%	51	16	10	5.	3.	1.	.6	1.	.6	1.	5.	.0	10
	no	C	2	1	5	3	2	1	1	4	5	7	1	8	5
		%	48	18	9.	5.	5.	3.	1.	.7	.9	1.	3.	1.	10
	yes	C	1	7	3	4	3	3	1	0	2	0	3	0	4
		%	36	17	7.	9.	7.	7.	2.	.0	4.	.0	7.	.0	10
T		C	3	1	7	4	3	2	1	7	8	1	3	8	7
		%	48	18	9.	6.	4.	3.	1.	.9	1.	1.	4.	1.	10

Table 9: Chi Square Results for Industry Type of Company and Availability of Company Website

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.830(a)	26	.032
Likelihood Ratio	46.839	26	.007
N of Valid Cases	754		

Note: (a) indicates 23 cells (54.8%) have expected count less than 5. The minimum expected count is .05.

Table 10: Chi Square Results For KLSE Listing Position of Company and Availability of Company Website

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.394(a)	4	.034
Likelihood Ratio	12.803	4	.012
N of Valid Cases	754		

Note: (a) indicates 2 cells (22.2%) have expected count less than 5. The minimum expected count is .44.

Table 11: Chi Square Results For Categories of Number of Company Shareholders and Availability of Company Website

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.961(a)	22	.253
Likelihood Ratio	26.063	22	.249
N of Valid Cases	754		

Note: (a) indicates 15 cells (41.7%) have expected count less than 5. The minimum expected count is .38.

REFERENCES

Baby steps for our net generation.(2000). *Jaring Internet Magazine*. Retrieved August 20,2001 from http://www.magazine.jaring.my

Cavana, R. Y., Delahaye, B.L., & Sekaran, U. (2001). *Applied business research:Qualitative and quantitative methods*. Australia:John Wiley and Sons Australia,Ltd.

Craven, B. M., & Marston, C. L. (1999). Financial reporting on the Internet by leading UK companies. *The European Accounting Review*, *8*,(2), 321-333.

Deller, D., Stubenrath, M., & Weber, C. (1999). A survey on the use of the Internet for investor relations in the USA, the UK and Germany. *European Accounting Review*, *8*,(2),351-364

Gordon, B., & Rittenberg, L.(1995).The Warsaw Stock Exchange:A test of market efficiency theory. *Comparative Economic Studies*, 37. Retrieved September 17, 2001, from http://ehostvgw10.epnet.com

Jones, C. P.(1991). *Investments: Analysis and management* (3rd ed.) New York :John Wiley & Sons, Inc.Listing Requirements of Kuala Lumpur Stock Exchange.(n.d.). Retrieved August 20, 2001 from http://www.klse.com.my

Lee, W.(2000). Internet took the crown as top IT growth area in M'sia. Retrieved August 20, 2001 from http://malaysia.cnet.com

Legard, D.(2000). 6 million Internet users in Malaysia this year, MDC says. In *IDG News Service\Singapore Bureau*. Retrieved August 20, 2001 from http://www.idg.net

Marston, C.(2003). Financial reporting on the Internet by leading Japanese companies. *Corporate Communication:An International Journal, 8*,(1), 23-34.

Marston, C. and Leow,C.Y.(1998).Financial reporting on the Internet by leading UK companies. Paper presented at the 21st Annual Congress of the European Accounting Association,Antwerp,April.

News features: Technology key to IR firm's survival.(2000, February 21).*Investor Relations Business*. Retrieved August 20, 2001 from http://proquest.umi.com

Parker,L.(1982). Corporate annual reporting: A mass communication perspective. *Accounting Business Research*,Autumn,279-286.

Trombly, M.(2000). New SEC rule pushes more firms to web. *Computerworld*, 34, 45. Retrieved August 20,2001 from http://proquest.umi.com

Ticehurst, G.W. and Veal, A. J. (1999*).Business research methods: A managerial approach*. Sydney:Longman.

Waryjas, M.A. and Thompson Jr.,L.M.(2000). A new millennium dawns for corporate

disclosure. *Insights*,14, 2. Retrieved August 20, 2001 from http://proquest.umi.com

Wertheim, R.W.(2000).Investor relations and the Internet: A revolution in the making. *Executives Speeches*, 14, 4. Retrieved August 20, 2001 from http://proquest.umi.com

Wertheim, R.W.(2000).Disclosure in Internet times. *Executives Speeches*, 14, 5. Retrieved August 20, 2001 from http://proquest.umi.com

Wetuski, J. (2000). IR gets wired. *Oil and Gas Investor*,.20, 11. Retrieved August 20, 2001 from http://proquest.umi.com

Wildstrom, S.H.(1997,April). Surfing for Annual Reports. *Business Week*,10.

Is Dollarisation a Viable Solution for the South Pacific Island Countries?
Results of a Preliminary Study

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ABSTRACT

The paper examines the case for adopting the Australian dollar as a common currency among the island countries in the South Pacific. The proposal of a single currency was made by Australia at the Pacific Forum Leaders Meeting in Auckland, in August 2003. The Pacific Forum consists of 14 developing island countries and the developed countries in the region, namely Australia and New Zealand. In early 2003, a Committee of the Australian Senate recommended adoption of a single currency as a possible remedy to meet the deteriorating economic situations in the Pacific island countries, arising out of poor fiscal discipline and failure to effectively use external aid inflows. Successful adoption of a single currency with either a new currency or an existing currency of a dominant partner in trade and development requires the fulfillment of various pre-requirements, which are well known as optimum currency area conditions. The paper assesses the feasibility of the proposal in the light of these conditions and concludes that the time for adoption has not yet arrived.

INTRODUCTION

The subject of a single currency for the Pacific region was proposed by Australia at the annual Pacific Forum Leaders' meeting held in Auckland in August 2003, which was attended by the prime ministers and presidents of the 14 Pacific Island Countries[1] (PICs) and the prime ministers of Australia and New Zealand. The 14 PICS and the region's two advanced countries constitute the Pacific Forum (Forum), a regional organization established in 1971, with its original name as South Pacific Forum until a name change in October 2000. Australia, as the largest and richest member of the Forum, bears a major proportion of its administrative costs. Further, it plays a lead role as a significant provider of foreign aid to PICs.

A common currency is essentially the ultimate of economic integration of states, known as currency union, without having to surrender their political identity as nations and their sovereignty. Known as currency union, it is a zone of countries or a region, where (i) a single currency circulates; (ii) a single monetary authority operates; (iii) a single exchange rate policy prevails; (iv) the single monetary authority maintains a common pool of reserves; and (v) free trade takes place within the region [(International Monetary Fund (2001), Fabella 2002)]. The proposal of a single economic space for the South Pacific region is not new. It has been toyed with from time to time over the last two decades in one form or another, as part of promoting regional economic cooperation.

The timing of the proposal for a common currency this time was, however, triggered by recent global developments. They include the perceived terror threat to the region and failure of some island states in maintaining peace and order, besides the renewed impetus given by the emergence of the euro as a common currency in 1999 in Europe. Furthermore, the deteriorating economic conditions in the last few years in some of the PICs due to their weak monetary and fiscal discipline and poor governance have been causing some concerns to the aid donors. These concerns came to be highlighted in a study by Hughes (2003), which prompted an Australian Senate Committee (2003) to come up with a strong plea for a *Pacific Economic and Political Community*. One of the suggestions for promoting regional stability was adopting a common currency, preferably the Australian dollar, replacing the existing national currencies.

In the event of the Australian dollar being adopted as the common currency of the region, the cost for Australia would be minimal since its central bank, the Reserve Bank of Australia (RBA) would continue with unfettered freedom to pursue its own monetary policy. Substantial benefits to Australia would consequently arise from increase in its volume of trade, since dollarisation of the region would lead to elimination of transaction costs and volatility in exchange rates between Australia and others in the region. As Alesena and Barro (2001) noted, just as a common language promotes communication among people, a common currency could promote trade and investment among countries in the region. These benefits will have to be weighed against the likely costs that have to be incurred by New Zealand and the 14 PICs. These would involve the costs of discontinuing their

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[1] The 14 Pacific island countries, which are members of the Pacific Forum along with Australia and New Zealand are: Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Federated States of Micronesia, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

own independent currencies by replacing with the Australian dollar and the loss of seigniorage revenue from printing their own currencies. Further, all of them have to fall in line with Australian macroeconomic and exchange rate policies.

A common currency entails a single set of economic, monetary, financial and fiscal policies to influence the balance of payments of the region. Such a single set of policies can be justified only when there is a high degree of synchronisation of business cycles for all prospective member countries of a currency union. According to Mundell's seminal contribution (1961), known as optimum currency area (OCA) conditions, countries experiencing common external shocks would be better suited to form a currency union because it permits the use of union-wide policies to correct any imbalances, including the adjustment of the common currency. The OCA conditions have since been elaborated, refined and updated by growing literature on the subject [Bayoumi and Mauro (1999), Eichengreen and Bayoumi (1999), International Monetary Fund (1997)]

The response to the single currency proposal at the 2003 Auckland meeting was mute. The studied silence of New Zealand was understandable as just two years ago, the then Governor of New Zealand's central bank (Brash 2000), went on record that the time for adopting the Australian dollar by New Zealand as a common currency was not ripe. Arguing along the lines of OCA conditions, he observed that there had been a lack of synchronisation of business cycles between Australia and New Zealand during the recent past. In addition to the availability of a central banker's point of view, there have been some academic studies as well on the feasibility of a currency union between the two countries. These include Crosby and Otto (2003), Coleman (1999), Hargraves and McDermott (1999), Grimes, F. Holmes, and Bowden (1998). The findings were, however, not unanimous. While Grimes *et al.* (1998) felt that a common currency for Australia and New Zealand would be beneficial, Crossby and Otto (2003) opined otherwise. The latter two authors argued from an Australian point of view and concluded that (i) Australia and New Zealand were not suitable candidates for the currency union; (ii) the benefits of a currency union for Australia would be small; and (iii) it would be worthwhile to consider currency union with the United States rather than with New Zealand.

While these studies focused on Australia and New Zealand, there are no such detailed studies on the 14 PICs. The available studies (de Brouwer 2000, Chand 2003) have so far been restricted to certain aspects. Further empirical investigations are needed with the specific objective to determine whether formation of a currency union with the Australian dollar as common currency would be beneficial for the island countries. The present paper seeks to present some preliminary results of an ongoing research project. The paper is organised into four sections. The first section provides a brief background of the Pacific island economies discussing their current trade patterns and their ongoing efforts towards regional integration; the second section outlines the theoretical reasoning behind OCA criteria for examining the feasibility of a currency union. The third section undertakes the empirical study and reports the results. The fourth section presents some conclusions with policy implications.

PACIFIC ISLANDS: A BRIEF BACKGROUND

The 14 PICs spread over the Pacific Ocean about some 10,000 kilometres (kms) from east to west and 5,000 kms. from north to south, with a combined exclusive economic zone (EEZ) of about 20 million sq. km. The total land area is just over 500,000 sq. km of which Papua New Guinea (PNG) accounts for 88%, and Fiji, Solomon Islands and Vanuatu for 11%, with the other 10 countries making up the remaining 1%. The population of the PICs is about seven million people, of which over five million are in PNG. At the other end of the scale is Niue, with a population of less than 2000 (Table 1).

There are serious constraints to growth and development, which stem forth from their geographical characteristics (Urwin 2004). These include:

- Remoteness and insularity: being located far from major markets and comprising widely dispersed multi-island micro-states, resulting in high international and domestic transportation costs, arising from both the distances to be covered and the low volume of cargo. Further, the development of even a small domestic market is constrained by distances between settlements and infrequent internal transport services.
- Susceptibility to natural disasters: being frequently affected by adverse climatic and other natural events that typically, affect the entire population and economy.
- Small population size: being limited by small population size, as it affects institutional capacity and increases unit costs of services, and also restricts the potential for private sector growth and investment.
- Limited diversification: having narrow resource base and small domestic markets necessarily result in being relatively un-diversified in production and exports, and also limits capacity in the private sector.
- Openness: relying heavily upon external trade and foreign investment to overcome inherent scale and resource limitations, which leaves states vulnerable to external economic and environmental shocks.

Urwin (2004) observed economic development in PICs since their independence was characterised by dominant role played by large public sectors, which were supported by grants and loans from their former colonial masters. Despite substantial aid, there has been a great variability in economic performance. Poor growth marked by stagnation in per capita incomes over two decades came to be looked upon as a "Pacific Paradox" (World Bank 1993). There have been several years when there was negative economic growth (Table 2). Since 1998, PICs for which GDP data are available, have suffered negative economic growth at some time excepting Samoa, Tonga and Tuvalu (Urwin 2004).

The PICs are open economies. In several cases, this is not because they have low trade barriers but because they are small and therefore have large import flows. In fact, Vanuatu, which has no direct taxation of any kind, relies upon indirect taxes, which are dominated by import and export duties, for revenue purposes. The PICs' trade volumes in commodities (exports and imports) expressed, as percentages of gross domestic product are fairly high. In 2000, they ranged from 120 per cent in Kiribati to 68 per cent in Republic of Marshall Islands (RMI). They have to depend upon imports for almost all commodities for even basic needs. Exports are confined to a few items including fish, copra, timber and tourism and remittances from the migrant seafaring men, to finance their imports. While PNG's major exports are gold, petroleum, copper, timber and coffee, Fiji's chief exports are sugar, garments and gold. For smaller island countries, which have negligible manufacturing capacity, reliance on primary exports is much greater. For Samoa, the main exports are fish, copra and related products; for Tonga they are squash, fish and root crops; and for Vanuatu, beef, copra and cocoa (Table 3). Thus, PICs are more competitive than complementary to each other.

Intra-PIC trade has been small (Table 4). The major intra-regional trading partners are Fiji and PNG because of their significant manufacturing base. Fiji has been exporting to other PICs processed consumer goods such as wheat flour, cooking oil and biscuits in fairly large volumes. On the other hand, Fiji's imports from other PICs are confined to a very small volume of agricultural commodities. PNG exports coffee and other manufactured goods. Thus, among PICs, only PNG and Fiji are relatively diversified.

Since 1993, the preferential trading arrangements under the Melanesian Spearhead Group (MSG) Agreement, which originally covered PNG, Solomon Islands and Vanuatu and later included Fiji from 1995, did encourage some intra-regional trade, among the four and free of trade restrictions in certain specified commodities, such as coffee, kava and beef. However, because of large increases in imports from the other two MSG countries relative to their exports, Solomon Islands and Vanuatu accumulated sizeable trade deficits with Fiji and PNG. As a result, in 2002, the former two countries sought temporary withdrawal from MSG Trade arrangements. The MSG agreement is presently of relevance only to Fiji and PNG.

The exchange rate arrangements of PICs vary, spanning the continuum from the exclusive use of a foreign currency as domestic currency through to a free-floating domestic currency (Table 2). Eight PICs, which do not have an independent domestic currency, have adopted the national currencies of Australia, New Zealand or the United States: Kiribati, Nauru and Tuvalu (using the Australian dollar); the Cook Islands and Niue (the New Zealand dollar); and the Federated States of Micronesia (FSM), RMI, and Palau (the United States dollar). Five PICs (Fiji, Samoa, Solomon Islands, Tonga and Vanuatu) have their own currencies, which have been pegged to baskets of currencies whose composition and weights are generally kept confidential. Among the 14 PICs, only PNG has a freely floating exchange rate regime. Rosales (2001) notes that inflation has been higher in PNG and in the dollarised countries. On the other hand, those PICs with independent currencies seemed to have done better on the inflation front. Thus, there is nothing remarkable to commend about any regime in particular.

Although currency reforms including adoption of a common currency among the island countries by replacing the existing currencies with a currency of their own or simply accepting the Australian dollar as their currency have not been given any priority by PICs, they were not lagging behind in their efforts toward greater integration. The island countries took major steps by signing two agreements in 2001. One signed by all 14 island countries is known as Pacific Island Countries Trade Agreement (PICTA) for ushering in free trade first among the developing PICs (Fiji, PNG, Palau, FSM, Samoa, Solomon Islands, Tonga, Vanuatu) by 2010 and amongst all PICs, including the remaining, known as small and least developed PICS (Cook Islands, Kiribati, Niue, Nauru, RMI, Tuvalu) by 2012. The other is known as Pacific Agreement on Closer Economic Relations (PACER) covering all 14 PICs, and Australia and New Zealand. The PACER visualises a free trade area among all the Pacific Forum Countries within eight years once PICTA was in place. After obtaining the necessary minimum number of ratifications by the legislatures of the countries concerned, (six in the case of PICTA; and seven in the case of PACER), the two agreements became effective[2]. These two agreements are expected to speed up the process of trade integration, paving the way for greater economic cooperation in the region.

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[2] The PACER became effective on October 3, 2002, as it required only six ratifications. Both Australia and New Zealand and four other PICs ratified to make it effective earlier than PICTA. They were followed by two other PICs. The PICTA

CURRENCY UNION: SOME THEORETICAL CONSIDERATIONS

The gains from a currency union, which are in terms of increase in efficiency, arise primarily from two sources. The first is that a common currency eliminates transaction costs usually incurred when trade and investment transactions need currency conversion. Secondly, a common currency eliminates risk from uncertainty in the movements of exchange rate between trading partners (De Grauwe 1997). One more gain is that a currency union provides a potential for reinforcing fiscal discipline and credibility of monetary policy (McKinnon 1993).

The disadvantages are obvious. They relate to the loss of two important macroeconomic adjustment tools, namely independent monetary and exchange rate policies. The member country has to abide by common monetary policy for the union as a whole; and it has to relinquish its exchange rate, an instrument for protecting itself from economic shocks. However, the costs are less severe if the shocks affect all member countries in the union in a similar fashion, and a common monetary and exchange rate policy *vis-a vis* with the rest of the world would then be appropriate. On the other hand if the shocks were asymmetric in nature, affecting the countries in a dissimilar manner, due to reasons such as different industrial structures, a common policy would be the least desirable. In such cases, the inability to use the exchange rate for making necessary adjustments would result in greater volatility in output and employment. However, disadvantages of such a nature can be reduced to a great extent if prices and wages are flexible and if there is perfect labour mobility between member countries. Thus, downward flexibility of wages and prices and labour mobility will enable the member countries in a currency union to withstand shocks of asymmetrical nature (Bayoumi and Ostry 1997).

Based on the foregoing discussion on gains and losses, the OCA literature (Mundell 1961, McKinnon 1963, Kenen 1969) identifies the following as key deciding factors for a currency union: openness, intra-trade volume, degree of product diversification, similarity in industrial structures, high correlation in economic activities, similar inflation rates, flexibility in wages and prices and factor mobility.

Openness

In a currency union, no individual country can alter the exchange rate rendering it redundant as a policy tool. McKinnon (1963) observed that the more open an economy is, the less effective is the nominal exchange rate as a policy instrument for adjustment. Thus, if an economy is more open, it makes it easier for it to enter into currency union arrangement in that the nominal exchange rate has already become a redundant instrument and therefore its loss as a policy instrument is negligible (Mekanda 2001). Frankel and Rose (1996) noted that the gains are much greater if an open economy enters into a currency union with a set of similarly open economies, which are also fully integrated in terms of capital and labour mobility since there is no need to maintain the exchange rate as a policy instrument for each individual country.

Intra-Regional Trade Volume

The higher the intra-regional trade between the prospective members of the currency union, the greater are the benefits that a common currency is likely to achieve (Bayoumi and Mauro 1999). This is because of the resulting lower transaction costs and avoidance of disruptions of trade related fluctuations in the bilateral exchange rates between the members of the union that are not warranted by fundamentals.

Degree Of Product Diversification

The composition of trade is another factor of importance. The higher the share of trade in manufactured goods, the greater is the appeal of a currency union among trading partners (Bayoumi and Mauro 1999), for the reason that their prices, unlike the prices of primary commodities being determined in world markets, are largely determined by producers. This is because fluctuation in bilateral exchange rates typically have a more significant impact on intra-industry trade in differentiated but substitutable products than on trade in homogenous primary commodities with a well integrated international market (Eichengreen *et al*. 1998). If an economy were more diversified in its goods produced, it would export a wider variety of products. In that case, if a fall in the demand for some of its produces occurred, the effects of such external shocks would not create large-scale employment. On the other hand, if an economy depends on one or two export products, fall in demand for them would be more disastrous, needing exchange rate adjustments. In an open but more diversified

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became effective on April 13, 2003 immediately after the minimum seven ratifications were obtained. Subsequently two more PICs ratified. As of May 2004, five PICs have not ratified both PICTA and PACER. These PICs are RMI, FSM, Palau, Tuvalu and Vanuatu.

economy, if independent shock affected each of its products, the law of averages would ensure that the economy remained stable. A more diversified economy is more suitable for a currency union than a less diversified one (Masson and Pattillo 2001a, 2001b, Kenen 1969). The suitability for a currency union gets further enhanced, if sufficient mobility of labour exists to re-absorb labour and capital that have been made idle by shocks (Mekanda 2001).

Similarity In Industrial Structures

Just as diversified economies are better candidates for currency union, similarities in industrial structures would strengthen their eligibility, since they are affected in a similar way by sector specific shocks. As such, this eliminates the need for effecting a unilateral change in exchange rate. In other words such economies have less to lose if they are part of a currency union (Bayoumi and Ostry 1997).

Similarity In Levels Of Development

Bayoumi and Mauro (1999) observed that the formal OCA criteria did not include the requirement of similarity in the levels of development in the candidate countries for a currency union. Similar levels of economic and financial sector development in the countries concerned would make it easier for them to enter into a union. It makes sense to look at the nearly five decade-old progress toward economic integration in Europe, where the process of forming a currency union was associated with a significant degree of economic convergence in real GDP per capita over the years[3]. This process was further supported by steadily growing intra-trade and labour mobility, which were promoted by deliberate integration, leading to formation of a customs union, and followed by a common market. These efforts accompanied fiscal transfers as well to the poorer members (Greece, Ireland and Portugal) of the European Union. In this connection, one would also refer to a parallel in the developing world. India, with a federal constitution, is also a currency union of 22 states with varying levels of development. A combination of free inter-state trade in goods and services together with mobility in labour and capital and constitutional provision of fiscal transfers from the federal government to economically backward states, has kept the union going (Fabella 2002).

High Correlation In Economic Activities

Even if the countries have different industrial structures, they might display a high degree of correlation in their economic activities. In that case, they can still be considered suitable candidates for a currency union because they are likely to experience similar economic shocks. This reduces the need for autonomy in exchange rate policy. They can afford to have a single currency (Maskay 2003).

Similar Inflation Rates

If countries have similar patterns of inflation rates, it can be concluded that they have been pursuing a similar set of economic policies and their economic structures are also similar. In these circumstances, it can be reasonably concluded that these countries are eligible for a currency union (Ng 2002).

Flexibility In Wages And Prices

If prices and wages are not sticky but flexible downwards between and among the prospective member countries of the currency union, there will be no need for using the exchange rate as an adjustment tool. In that case, there is a case for currency union (Mekanda 2001, Madhur 2002).

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[3] The Maastricht Treaty of 1991 provided a timetable, setting preconditions for the final stages of the process of currency union. The following five preconditions are known as convergence criteria. These are: (i) each country's budget deficit has to be below 3% of its GDP; (ii) each country's public debt, has to be less than 60% of GDP;(iii) countries should have an inflation rate within 1.5% of the three EU countries with the lowest rate; (iv) long-term interest rates must be within 2% of the three lowest interest rates in EU; and (v) exchange rates must be kept within "normal" fluctuation margins of Europe's exchange-rate mechanism. Greece was the only one member of the European Union, which was told that it was not ready to join the single currency with the first wave of countries in 1999. It had to wait for two years before joining the Eurozone at the beginning of 2001.

Factor Mobility

A high degree of mobility of factors including labour and capital among the candidate countries would provide a substitute for exchange rate adjustments as a policy tool to meet economic shocks. Such countries would gain the most from a currency union (Kuroda 2004, Madhur 2002, Fabella 2002).

Political Commitment

Fulfillment of the OCA criteria is only a necessary but not a sufficient condition for ushering in a currency union. One has to clearly recognise the role of politics in monetary integration (Blackman 2001). As a member of the Executive Board of European Central Bank recently observed, monetary integration requires strong political support from all the candidate countries (Padoa-Schioppa 2004)[4]. William Demos, a former Governor of the Central Bank of Trinidad and Tobago, who later became the first Secretary General of the Caribbean Community and Common Market (CARICOM) noted that a single independent currency, which entailed a single set of economic, monetary and fiscal policies, was possible only with a high degree of economic union, tantamount to a political union (Demas 1974). Thus, there should be willingness on the part of the countries aspiring to form a currency union to accept loss of some measure of sovereignty. As witnessed in the case of members of the Eurozone, besides the surrender of monetary sovereignty to a supranational authority, fiscal policy too was constrained first by the convergence criteria imposed by the Maastricht Treaty of 1991 and then by the Growth and Stability Pact of 1996. The members of EU were also required to open their capital and labour markets by implementing the policies towards harmonisation of a wide range of commercial and legal standards (Bayoumi and Mauro 1999).

EMPIRICAL INVESTIGATION

The striking feature of the PICs is their huge diversity in terms of land area, population and GDP. For example, PNG is 130 thousand times larger than the smallest country with 24 sq. kms, 3400 times more populous than Niue with 1500 people and has GDP over 1060 times greater than Tuvalu with has the smallest GDP of US$4 million. However, other indicators, including Human Development Index have similar values (Table 1), except for three PICs, namely Cook Islands, Niue and Palau, which have much higher ranks than others.

Table 5 presents a summary of economic indicators (growth rate, inflation and fiscal deficit) of PICs for a nine-year period (1995-2000). The average growth rate of 12 PICs (excepting Nauru and Niue for whom data are not available) is 2 percent, which is lower than the corresponding rates of countries in other regional groupings, including the South Asian Association of Regional Cooperation (SAARC) and Association of South Eastern Asian Nations (ASEAN). As regards average fiscal balance as a percent of GDP, the PICs have done much better than others. Similarly, the PICs' average inflation is comparable to the Euro average and is better than those of SAARC and ASEAN. The reasons are obvious. External aid to PICs has provided substantial budgetary support. Further, most of the PIC imports are from Australia and New Zealand, whose central banks have been targeting inflation through their monetary policies. In fact, both Australia and New Zealand have had much higher rates of growth than Eurozone and have an equally good record in fiscal balance and inflation levels.

Intra-PIC Trade

A comparative picture on regional trading patterns is presented in Table 6, which gives details of intra-trade and total trade of each PIC in terms of percentages of their respective GDPs. The PICs, as a group, are the second

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[4] Gathering political support and securing consensus for achieving monetary integration in Europe took nearly five decades. There were several notable milestones. Setting up of the European Coal and Steel Community was the first one in 1950, which aimed at free trade in coal and steel by 1954. Establishing the European Economic Community under the Treaty of Rome signed in 1957; European Free Trade Association in 1960; and several regional institutions and harmonising measures for facilitating movement of capital and labour under the Single European Act of 1987 followed these. The creation of a single market was achieved in 1992. Along with these measures, there were parallel efforts in monetary integration. These included introduction of the European Monetary System in 1979 for creating an area of exchange rate stability among members by ushering in the Exchange Rate Mechanism and the European Currency Unit, paving the way for Monetary Union within European Community. In 1989 the Delors Report recommended the introduction of a single currency by setting out stages including the establishment of the European Central Bank System. The stages included the signing of Maastricht Treaty of 1991, which laid down the criteria for reaching convergence and enactment of the Growth and Stability Pact of 1996. The latter levied a fine of 0.1 percent of GDP on members in case of fiscal deficits in excess of the 3% of GDP ceiling. These measures, which were introduced and implemented through political consensus, eventually prepared the members to become eligible for adopting the single currency. The Euro was ultimately born on Jan 1, 1999.

most open (trade openness being about 79 percent of GDP), next only to ASEAN. However, their intra-trade (12 percent of GDP) is lower than that of the Eurozone (25 percent) and ASEAN (24 percent).

On the other hand, PICs, except RMI, FSM and Palau, which have been closer to the USA because of the past political relations, have substantial trade with Australia and New Zealand. For example, Australia is the major destination for Samoa's exports (60 percent in 2002) and PNG's imports are dominated by Australian goods (49 percent in 2002 (Table 4). Similarly, Fiji exports one fifth of its goods to Australia and imports from Australia more than one third of its total imports.

A review of the patterns and trends of intra-trade among PICs shows that the volumes of trade in both absolute and percentage terms are very small (Table 4). The major intra-regional trading partners among PICs are Fiji and PNG, which have relatively large manufacturing base. PICs as a whole lack product diversity. Consequently, all of them have had to depend upon Australia and New Zealand for other consumer products, and on Japan and the USA for machinery and transport vehicles and other intermediate products.

In terms of percentages of GDP, intra-regional trade volume in 2001 varied from a near 70 percent in Tuvalu, which imports substantial consumer goods from Fiji, to 0.01 percent in FSM in 2000 for which complete trade data are available. The reason is FSM due to its closer relations with USA, combined with its adoption of US dollar as its legal tender, imports most of its consumer goods from America. In terms of percentages of total trade, they ranged from 56 per cent in Tuvalu to 0.02 percent in FSM. Only under exceptional circumstances, such as cyclones or poor agricultural seasons, do PICs import staples such as root crops from other PICs. For instance, in the early 1990s, when coconut palms in Tonga were uprooted by cyclones, coconuts were imported from Samoa. Likewise, in the mid 1990s when the taro leaf blight severely damaged root crops in Samoa, resulting in poor yields for three years, large volumes of taro were imported from Tonga and other PICs to meet domestic requirements. Thus, any commodity trade between PICs in similar and competitive crops has been exceptional.

These characteristics render their economies more competitive than complementary to each other, resulting in a low volume of intra-regional trade. While one of the principal OCA requirements for a currency union amongst themselves is very weak, there appears to be a case for moving to a closer level of cooperation between PICs and Australia and New Zealand. A higher pre-union volume of trade with Australia is likely to yield substantial gains to PICs in the event of a currency union either by adopting a common currency or by dollarising themselves as transaction costs from conversion and volatility in exchange rates would be totally eliminated. However, there are other critical factors remaining to be examined. These relate to testing the existence of high correlation in economic activities between PICs and Australia as well as similar inflation rates so that a common set of union wide policies can be pursued.

Correlation Of Growth Rates

Any correlation of economic activities would be reflected in the correlations of economic growth among the countries. Table 7 presents the correlation matrix of annual growth rates in GDP of 13 countries, which include 11 PICs and Australia and New Zealand for a 19-year period (1985-2003), showing both positive and negative correlation between individual countries. What is important is the requirement of positive sign of correlation, as countries should grow together so that a single set of monetary and exchange rate policies, when adopted at the union level, become purposeful. Further, we have to test whether the correlations with positive signs are also statistically significant. The choice of statistical significance at 5 percent level requires a 45% coefficient of correlation, given the number of observations being 19[5]. The significant correlation coefficients are shown with asterisks (*). The growth rate of Australia is significantly correlated only with that of Samoa, while New Zealand's growth rate is not significantly correlated with any country. Similar are the cases of Fiji, Kiribati, PNG, RMI, and Solomon Islands. Correlation exists only between growth rates of the following pair of countries: Cook Islands and FSM, Cook Islands and Tonga, and FSM and Tonga. Thus, out of 78 correlation coefficients, only five are significant.

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[5] The statistic used for testing the correlation coefficient whether it is significantly different from zero is $\ln[(1+r)/(1-r)]/2$, where r is the sample correlation coefficient. It has an asymptotically normal distribution with a variance of (N-3), where N is the number of observations. Using the level of significance, $\alpha = 0.05$, the rejection region is $Z = 0.5(N-3)^{1/2}\{\ln[(1+r/(1-r)]\} > 1.96$ (Romano 1970: 156-170). If N = 19, r should be 0.4542; and if N = 18, r should be 0.4669.

Correlation Of Inflation Rates

Similarity in the monetary and fiscal policies pursued by each of the 13 countries should give rise to high correlation of inflation rates among them. From Table 8, which reports 78 correlation coefficients, it is seen that the Australian inflation rate is significantly correlated with those of FSM, New Zealand, Tonga and Vanuatu, while the inflation rate of New Zealand is significantly correlated with, besides Australia, two PICs. Among the PICs, the inflation rate of Cook Islands is significantly correlated with those of four PICs, while Fiji's with those of three other PICs and FSM's with those of four PICs. Thus, out of 78 correlation coefficients, only 17 are significant.

Correlation Of Interest Rates

Another test of similarity in monetary policies is correlation of interest rates prevailing in the financial sectors of Australia, New Zealand, and PICs with the exception of six countries (Cook Islands, Kiribati, RMI, FSM, Palau and Tuvalu), as they do not have monetary authorities of their own. Table 9 provides 28 correlation coefficients, out of which only eight are significant.

Correlation Of Exchange Rates

An impending currency union would result in the loss of exchange rate as a policy tool. The loss would be minimal for each country, if its pre-union exchange rate has been moving with those of other countries. A high correlation coefficient would signify that the countries are suitable candidates for the union. Table 10 presents the correlation matrix of nominal effective exchange rate (NEER) indices for six countries, as reported by International Monetary Fund (2003). While Australia's NEER index is not correlated with that of any other country in the region, Fiji's is found correlated with NEERs of three PICs, New Zealand's correlated with that of Samoa and Samoa's with that of Solomon Islands. Thus, out of 15 correlation coefficients, only 6 are significant.

More important in this regard is the requirement of correlation of real effective exchange rates (REERs), rather than that of NEERs. The REERs are endogenous prices, which are considered as the outcome of the structure of the economy as well as of domestic and external shocks. If countries were similarly placed in terms of economic structure and external and domestic shocks, their REER movements would display common trends (de Brouwer 2000). Table 11 shows absence of correlation. On the other hand, there is substantial divergence, indicating that the PICs and Australia are not prone to similar shocks. While Australia's and New Zealand's REERs are significantly correlated with each other, neither neither Australia nor New Zealand's REER is correlated with REER of any PIC.

Mobility Of Labour And Capital

The foregoing discussion establishes in clear terms that Australia and New Zealand are suitable candidates for a currency union with each other rather than with PICs. Australia and New Zealand have a high degree of similarity in levels of development. Further, both have sufficient product diversity. The movements in the interest rates and real exchange rates of Australia and New Zealand are also in more unison with each other reflecting a high degree of synchronisation of policies between the two countries. Added to the fulfillment of OCA conditions, there is already a high degree of mobility in labour and capital between the two Tasmanian neighbours, lessening the need for any adjustment in exchange rates between the two.

There is no such labour mobility between Australia and PICs, or between New Zealand and PICs. In the absence of any indication of relaxation of current tight immigration policies allowing for labour mobility between PICs and Australia or New Zealand in the near future, it is difficult to visualise any monetary integration in the short run. It was shown that PICs could not afford to have the same set of policies of Australia, as the challenges of growth and development are different. The absence of co-movements in growth rates, inflation and interest and exchange rates points out that time is not ripe enough for PICs to adopt the Australian dollar as common currency.

Regarding the possibility of a currency union arrangement among PICs themselves without involving Australia or New Zealand, the pointers are also clear. The pre-union intra-PICs trade is low; the PICs are not diversified; and they lack product diversity. Further, their development levels are different and their growth rates exhibit more divergence than convergence, as the number of significant correlations is just a few. Similar is the situation, when inflation rates of PICs are considered. Thus, there is no synchronisation of monetary polices

either. Furthermore, in regard to exchange rates, the trend is the same. The pre-union realities lead to the conclusion that PICs are not suitable candidates for a currency union among themselves.

SUMMARY AND CONCLUSIONS

This paper examined the case for dollarisation of PICs. An empirical investigation on the suitability of PICs adopting the Australian dollar as their legal tender was conducted by applying the OCA criteria of pre-union trade volume and patterns, openness and similarity in levels of development. The investigation was extended to analyses of correlations of growth rates, exchange rates and inflation during last 19 years (1985-2003). The results showed that the case for PICs adopting the Australian dollar as common currency is weak.

The evidence indicates that there was no convergence of macroeconomic policies pursued by PICs and Australia, since economic shocks hitting both sets of countries were dissimilar and there would be no gains for PICs agreeing to Australia's own set of monetary and exchange rate policies being adopted for the region as a whole. Since PICs and Australia have different levels of development, the growth and development challenges facing PICs are different from those of Australia. Union-wide policies at this juncture would not be suitable for PICs. The same conclusion was reached for the currency union among PICs themselves, without involving Australia.

However, it is possible to argue for a currency union with Australia on the grounds that OCA criteria are to some extent endogenous and currency union might help make the shocks hitting member countries more symmetric in the future and might also expand intra-union trade (Frankel and Rose 1998, Masson and Pattillo 2001a). These arguments are not different from the observations by Scitovsky (1958) when the European Common Market was born. He observed that common currency arrangements would by themselves make the countries similar all along the way. However, it should be noted that the EU member countries did not plunge into a currency union arrangement, as they were aware of the pitfalls and insisted on fulfilling the convergence criteria contained in the Maastricht Treaty of 1991 and the requirements under the Growth and Stability Pact of 1996.

If Australia were keen about dollarisation of PICs, the latter are likely to seek and secure some assurances from the former. Since dollarisation would result in discontinuance of their independent currencies, PICs would lose the current revenue flowing from the sovereign right of printing its own currency. The PICs would then like to have a share in the seigniorage revenue, which would accrue only to Australia. Secondly, since there would be only one common central bank in a currency union, a given PIC would not be able to support its domestic banks in the event of a bank crisis. In such circumstances, PICs would like to be assured of liquidity support from Reserve Bank of Australia, as a lender of last resort for rescuing their crisis-affected banks. Thirdly, if the Reserve Bank of Australia finds it inopportune to follow an expansionary monetary policy or would not like to use the exchange rate as the policy tool to fight unemployment in one or more of its member countries, PICs would prefer the mechanism of fiscal transfers to needy member countries. Finally, a currency union without mobility of labour and capital would be a failure since PICs would lose the exchange rate as a policy tool to effect corrections in domestic pricing of goods and factors. In the absence of downward flexibility in prices and wages in PICs, labour mobility is the only way to have a successful union. The PICs would legitimately seek assurances on all these issues.

The issues including labour mobility and fiscal transfers have far reaching implications. They have to be resolved at political levels. It is not yet clear whether these have been resolved even in Australia through a national consensus, let alone reaching an understanding with other Pacific Forum leaders or an agreement amongst the island countries themselves. A currency union either with a common currency of their own or adopting another national currency as legal tender amounts not only to a total surrender of monetary sovereignty, but also involves some degree of abdication of political sovereignty.

REFERENCES

Asian Development Bank (ADB), (2003). *Key Indicators of Asian and Pacific Developing Countries 2003,* Asian Development Bank, Manila.
Alesena, A. and R. Barro (2001), "One Country, One Currency"**,** in *Currency Unions*, (Eds), A. Alesena and R. Barro, Stanford: Hoover Institution, pp.11-20.
AusAID, 2001, *Pacific: Program Profiles: 2000–01*, Australian Government Overseas Aid Program, Canberra.
Australian Senate Committee Report, (2003). *A Pacific Engaged: Australia's Relations with Papua New Guinea and the Island States of the Southwest Pacific,* Canberra: Commonwealth of Australia.

Bayoumi T., and P.Mauro (1999). *The Suitability of ASEAN for a Regional Currency Arrangement*, IMF Working Paper WP/99/162, Washington, D.C.: International Monetary Fund.

Bayoumi, T. and J.D.Ostry (1997). "Macroeconomic Shocks and Trade Flows within Sub-Saharan Africa: Implications for Optimum Currency Arrangements", *Journal of African Economies*, 6(4): 412-444.

Blackman, C, (1998), *Central Banking in Theory and Practice: A Small State Perspective*, Caribbean Centre for Monetary Studies, St Augustine, Trinidad.

Brash, D. (2000). *The Pros and Cons of Currency Union: A Reserve Bank Perspective,* An address to the Auckland Rotary Club, 22 May 2000. *http://www.rbnz.govt.nz/speeches/0091114.html*

Centre for International Economics (CIER), 1998, *Costs and Benefits of a Free Trade Area between Forum Island Countries and Australia and New Zealand,* CIER, Canberra and Sydney.

Chand, S (2003). "An Assessment of the Proposal for a Pacific Economic and Social Community" *Pacific Economic Bulletin*, 18 (2): 117-124.

Coleman, A, (1999). "Economic Integration and Monetary Union", *New Zealand Treasury Working Paper 99/6,* Wellington: Government of New Zealand Treasury.

Crossby, M. and G.Otto (2003). "An Australia and New Zealand Currency Union", University of Melbourne. http://www.economics.unimelb.edu.au/mcrosby/ANZ.PDF

de Brouwer, G, (2000). "Should Pacific Island countries Adopt the Australian dollar?", *Pacific Economic Bulletin*, 15(2): 161–9.

de Grauwe, P. (1994). *The Economics of Monetary Integration*, Oxford University Press, New York.

Demas, W. (1974). *West Indian Nationhood and the Caribbean Integration*, CCC Publishing House, Barbados.

Eichengreen, B. and T. Bayoumi (1999). "Is Asia an Optimum area? Can it Become One?" in S. Collignon, J. Pisani-Ferry and Y.C. Park (eds.) *Exchange Rate Policies in Emerging Asian Countries,* Routledge, London.

Fabella, R. (2002). "Monetary Cooperation in East Asia", *Economics and Research Department Working Paper No.13*, Manila: Asian Development Bank.

Frankel, J. A, and A. K. Rose, (2000). *Estimating the Effect of Currency Unions in Trade and Output,* National Bureau of Economic Research Working Paper (NBER) No.7857, NBER, Cambridge, Mass.

Grimes, A., F. Holmes and R. Bowden (2000) *An Anzac Dollar? Currency Union and Business Development,* Institute of Policy Studies, Wellington, New Zealand.

Hall, V., K. Kim, and R. Buckle (1998) "Pacific Rim Business Cycle Analysis: Synchronization and Volatility," *New Zealand Economic Papers,* 32, 129-159.

Hargreaves, D. and J. McDermott (1999) "Issues relating to Optimal Currency Areas: Theory and Implications for New Zealand," *Reserve Bank of New Zealand Bulletin,* 62, 16-29.

Hughes, H. 2003. *Aid has Failed in the Pacific*, Issue Analysis No.33, Sydney: The Centre for Independent Studies.

International Monetary Fund (IMF), (2003). *International Financial Statistics Yearbook 2003*, Washington, DC: Canberra.

International Monetary Fund (IMF), 2001. "International Experience with Common Currency Arrangements", *Paper presented at the Seminar on Common Currency Arrangements and the Exchange Rate Mechanism in ASEAN*, August 6-7, Kuala Lumpur.

IMF, (1997). *Optimum Currency Areas: New Analytical and Policy Developments*, Washington, DC: IMF

Kenen, P B. (1969). "The Theory of Optimum Currency Areas: an Eclectic View", in *Monetary Problems of the International Economy,* Eds. R Mundell and A Swoboda, University of Chicago Press, Chicago: 41–60.

Kuroda, H. (2004). "Transitional Steps in the Road to a Single Currency in East Asia", *Statement made at the Asian Development Bank Seminar on Single Currency for East Asia-Lessons from Europe,* Jeju, Korea, May 2004.

Madhur, S. (2002). "Costs and Benefits of a Common Currency for ASEAN", *Economics and Research Department Working Paper No: 12*, Manila: Asian Development Bank.

Maskay, N. M. (2003), "Patterns of Shocks and Regional Monetary Cooperation in South Asia", *Working Paper No.WP/03/240*, Washington, D.C.: International Monetary Fund.

McKinnon, R I, (1963), "Optimum currency areas", *American Economic Review*, 53: 717–24.

Masson, P. and C. Pattillo, (2001a), "Monetary Union in West Africa: An Agency of Restraint for Fiscal Policies"*, IMF Working Paper*, WP/01/34, IMF, Washington, DC.

Masson, P and C Pattillo, (2001b), "Monetary Union in West Africa (ECOWAS): Is It Desirable and How Could It Be Achieved"*, Occasional Paper No.204*, IMF, Washington, DC.

Mekanda, B. K. (2001)."Is Africa an Optimum Currency Area*?", Working Paper No:41*, Department of Economics, Goteborg University.

Mundell, R, (1961), "A theory of optimum currency areas", *American Economic Review,* 51: 657–64.

Ng, T.H. (2002). "Should the Southeast Asian Countries Form a Currency Union?", *The Developing Economies*, XL (2): 113-34.

Padoa-Schioppa, T. (2004). "Regional Monetary Cooperation in a Globalised World", *Paper presented at the Asian Development Bank Seminar on Single Currency for East Asia-Lessons from Europe,* Jeju*,* Korea, May 2004.

Romano, A., (1970). *Applied Statistics for Science and Industry*, Boston: Allyn and Bacon Inc.

Rosales, J R. (2001), "Macroeconomic Policy and Financial Sector Stability in Pacific Island Countries", *Paper presented at the Conference on Financial Sector Stability and Development*, Apia, 2–21 February.

Scitovsky, T, (1958), *Economic Theory and Western European Integration*, Allen & Unwin, London.

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), (2004). *Economic and Social Survey 2004*, Bangkok: UNESCAP

Urwin, G. (2004). "Economic Development of Pacific Island Economies and Regional Cooperation" Public Speech at the University of the South Pacific, May 18, 2004. http://www.forumsec.org.fj.

World Bank, (1993). *Pacific Island Economies toward Efficient and Sustainable Growth,* Volume on An Overview, Washington D.C.: World Bank.

Optimum Currency Areas in East Asia: A Structural VAR Approach

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ABSTRACT

This paper assesses the empirical desirability of the East Asian economies to an alternative exchange rate arrangement (a monetary union) that can potentially enhance the exchange rate stability and credibility in the region. Specifically, the symmetry in macroeconomic disturbances of the East Asian economies is examined as satisfying one of the preconditions for forming an Optimum Currency Area (OCA). The Structural Vector Autoregression (VAR) method is employed to assess the nature of macroeconomic disturbances among the East Asian countries, as a preliminary guide in identifying potential candidates for forming an OCA. The preliminary findings of this study suggest that there exists scope among some small sub-regions for potential monetary integration.

INTRODUCTION

The Asian financial crisis has renewed calls for greater monetary and exchange rate cooperation. Among the remedial and preventive measures that have surfaced during the 1998 Asean ministerial meeting in Hanoi was the idea of a common currency and exchange rate system. Asean is already looking into the feasibility of a common currency and exchange rate system as part of the plan to promote greater economic integration and monetary cooperation in the region.

In May 2000, at their meeting in Chiang Mai, Thailand, the ASEAN +3 (APT) countries (the members of ASEAN together with China, Japan and Korea) agreed to establish a network of bilateral swaps for countries in financial difficulties. Their Chiang Mai Initiative was regarded as an important first step toward creating a common Asian currency. As a result of its announcement, the idea of a single currency for East Asia was transformed from a "laughable concept" to a "possible policy goal".[1]

Under what conditions should a region renounce individual currencies to advance into a currency union? The traditional framework to address this question was created by Mundell (1961), McKinnon (1963), and Kenen (1967) and later formalized by Bayoumi (1994) and Ricci (1997). Much of this literature focuses on three inter-relationships between the members of a potential OCA. They are: (1) the trade intensity; (2) the similarity of the shocks and cycles; and (3) the degree of factor mobility. The greater the linkages between the countries using any of the three criteria, the more suitable a common currency. Given the theoretical consensus in the area, OCA criteria have been applied extensively, especially in judging the suitability of different European countries for EMU. Since the similarity of shocks captures the interaction between several properties, most of the OCA literature examine only the business cycle correlations as the satisfying condition of OCA.

This study aims to empirically assess the suitability of the East Asian economies for potential monetary integration on the basis of their symmetry in macroeconomic disturbances, as satisfying one of the preconditions for forming an OCA. The greater the symmetry in underlying shocks among the East Asian Economies, the lower the value placed on changes in the exchange rate as an instrument of relative price adjustment and making them better candidates for monetary integration. Since it is not a threshold question in which we know

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[1] Castallano (2000), p.9

that symmetry is no longer a problem if shock correlation exceeds a certain value, the usual comparative analysis will be done. European Union region is chosen as the benchmark for comparison.

The estimation of the incidences of macroeconomic disturbances is inherently empirical. One of the first empirical papers to have dealt with the issue of macroeconomic disturbances through a statistical approach is by Bayoumi and Eichengreen (1993). Applying a variant of the VAR methodology proposed by Blanchard and Quah (1989), Bayoumi and Eichengreen (1993) assess the nature of macroeconomic disturbances among different groups of countries. The authors measure the importance of asymmetric demand and supply shocks across members of the European Community (EC) and the United States is chosen as a benchmark. Their approach emphasises on the needs to distinguish between cross-country correlations of *observed economic variables* (like output and prices) and those of *underlying structural shocks* (demand and supply disturbances originating from shifts in technology, preferences, policy changes, etc.). The underlying structural shocks transmit their influence to the observed economic variables through a complex chain of links, both domestic and international (through trade flows and the transmission via the financial markets). Observed economic variables can display strong international correlations even if the underlying shocks are not interrelated, if the international transmission mechanism is sufficiently strong.[2] Their results indicate that the EC was divided into a "core" group of countries (Germany, France, Netherlands, Belgium and Denmark, with stronger "structural" correlations than the "peripheral" ones (UK, Italy, Spain, Ireland, Portugal, Greece). Their results also indicate that the supply and demand shocks to the core EC countries were on average smaller and more correlated with each other.

Bayoumi and Eichengreen (1994) carried out an empirical study on East Asian countries to estimate the correlations of underlying shocks among these countries.[3] They conclude that East Asian can be grouped into two OCAs, namely the Northern Asian bloc (Japan, Korea and Taiwan) and the Southeast Asian bloc (Hong Kong, Indonesia, Malaysia and Singapore) as they find supply shocks symmetrical among these two groups of countries. Demand shocks are found to be highly symmetrical for the latter group of countries. Their results on the correlation, size and speed of adjustment to underlying disturbances for Asia are updated in Bayoumi, and Mauro (1999).[4] They find that macroeconomic disturbances appear relatively similar across some ASEAN members, a pattern also seen in Europe in the 1980s. It is concluded that aggregate supply disturbances affecting Indonesia, Malaysia and Singapore are reasonably correlated, while the Philippines and Thailand experience more idiosyncratic shocks.[5] Their study also reports that, (1) size of the disturbances experienced by the Asian economies is considerably larger than that of the equivalent shocks for Europe[6]; (2) the speed of adjustment in Asia (and ASEAN in particular) is much more rapid than in Europe. Based on economic criteria, the authors conclude that ASEAN is less suitable for a currency union than the continental European countries were in 1987 (a few years before the Maastricht treaty providing a road map for EMU was signed), although the difference is not very large.[7]

This study extends the Bayoumi and Eichengreen (1994, 1999) study by considering longer period. In addition, we separate the data into two periods, before and after 1997 to study the impact of Asian financial crisis. We have also included China, a country absent in Bayoumi and Eichengreen's studies, in our study.

The remainder of this article is organised as follows. Section 2 discusses the methodology used in this study. Section 3 discusses the data. In section 4, we provide the empirical findings on the estimation of the underlying structural shocks as well as their sizes and the adjustment speed to shocks. The results are compared with the one prevails in the EU region. Finally, section 5 concludes the article.

METHODOLOGY

This study applies Bayoumi and Eichengreen (1993, 1994, 1999) approach to isolate the permanent and transitory effects of macroeconomic shocks. Their model is based on the Aggregate Demand-Aggregate Supply framework. They argue that a positive demand shock will increase both price and output in the short run but only price in the long run, whilst positive supply shocks will increase output and lower price both in the short

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[2] Canova and Dellas (1993) build a real business cycle model in which trade intensity induces international correlation of business cycles, and test it on a panel of 10 countries. Their estimates confirm the existence of such link.

[3] Their sample covers the years 1972-1989.

[4] The updated Asian results use data from 1968 to 1998, compared to a sample period of 1969-1989 used in the European results reported. The results are reported in Table 3 and 4.

[5] The authors claim that there are parallels with Europe, where the shocks experienced by France and Germany are relatively highly correlated, while those affecting Italy and Spain were more idiosyncratic (p.8).

[6] This also occurs when the sample period excludes the Asian crisis (1997 and 1998).

[7] The authors view firm political commitment as vital in forming a regional currency arrangement.

run and long run. In other words, while supply shocks have long run permanent effects on the level of output, demand shocks only have temporary effects. (Both have permanent effects on the level of prices.) The procedure used is a modification of Blanchard and Quah (1989), developed by Bayoumi (1992). The details of the model is presented in Appendix 2.

DATA

This study examines eight East Asian countries, namely ASEAN 5 – Indonesia, Malaysia, the Philippines, Singapore and Thailand – and China, Japan and Korea.[8] All the EU countries except Luxembourg are examined in this study. The data used in this paper are drawn from the World Bank's World Development Indicators CD-ROM, except for Austria, France and Germany, for which data are obtained from the International Financial Statistics. In analysing the macroeconomic shocks, two different sample periods will be examined in East Asia. It is our interest to find out how the inclusion of the periods after Asian financial crisis in mid-1997 affects the results. The first sample period covers 1960-1997 and the second sample period covers 1960-2001. For the EU countries, annual data on real GDP and GDP deflator were collected for 1960-1998, periods before the European Monetary Union in 1999.[9] For each country growth and inflation were calculated as the first difference of the logarithm of real GDP and the GDP deflator.[10]

ESTIMATION AND RESULTS

We estimated bivariate VARs for each country and region in the sample to identify supply and demand shocks. The standard Schwarz information criterion (SC) was used in determining the optimal lag length. Since most of the models had an optimal lag length of one, the number of lags was set at 1 for all countries to preserve the symmetry of the specification across countries.

Correlation of Supply and Demand Shocks

The structural VAR approach mentioned earlier is used to estimate the underlying macroeconomic disturbances. It is assumed that if the correlation of structural shocks is positive, the shocks are considered to be symmetric, and if negative, they are asymmetric. Results of the two identified shocks among the East Asian economies are reported in Table 1.

Examining the sample period 1960-1997, this study finds relatively symmetric supply shocks for the following groups of countries: Japan, Korea and Thailand; Malaysia and Indonesia; Malaysia and Singapore; Malaysia and Thailand; and the Philippines and Singapore. The Asian regional crisis was sparked in mid-1997 by the devaluation of the Thai baht. This can be seen by the significant increase in supply shocks correlations between Thailand and the rest of the East Asian economies (except China) after the financial crisis. . The results have shown that, after the financial crisis, the supply shock correlations among all the East Asian economies concerned have increased rather significantly, especially for the most-hit economies by the crisis (compare Panel A and C in Table 1).

This study finds three overlapping subgroups when the periods after the financial crisis are included: (1) Japan, Korea and Thailand; (2) Indonesia, Korea, Malaysia and Thailand; (3) Korea, the Philippines, Malaysia, Singapore and Thailand. The only ASEAN country that shows highly symmetrical supply shocks with Japan is Thailand. This result is not surprising as Thailand is one of Japan's closest friends in Southeast Asia. Due to the appreciation of the Yen, many Japanese companies have moved into Thailand in the 1980s. Japan is one of the most important trading partners and the largest investor in Thailand. China has experienced mainly asymmetric shocks or insignificant correlations with the rest of the East Asian economies. Based on our empirical results in both sample periods, China should be excluded for any regional monetary arrangement. Overall, the demand shocks tend to be less symmetric than the supply shocks in the East Asian economies in both sample periods.

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[8] The new ASEAN members include Cambodia, Laos, Myanmar and Vietnam are excluded in the study as the stages of development in these countries are very much different from the rest of the APT members. Williamson (1999), for example, omits the new members of ASEAN, limiting the heterogeneity of the countries adopting a common basket peg. We lack data on Brunei.

[9] The sample periods covered in this study include a potential change in regime due to the break-up of the Bretton Woods in the early 1970s. However, Bayoumi and Eichengreen (1993) report that their tests of structural stability produced no evidence of a shift in the early 1970s.

[10] Bayoumi and Eichengreen (1993) state that GDP deflator should be chosen over CPI since it reflects the price of output rather than the price of consumption.

However, Japan tends to have more highly correlated demand shocks with the ASEAN countries (except Indonesia).

We conducted a similar study of the structural shocks for the EU countries; the results are reported in Table 2. German supply shocks are found to be highly correlated with those experienced by the following countries: Austria, Belgium, Denmark, France, Greece, Italy, Netherlands, Portugal and Spain. Its supply shocks correlations with other EU countries are either asymmetric or low. The empirical results show that only sub-grouped EU countries experienced symmetric supply shocks. For instance, Ireland's supply shocks with the other EU countries are mostly asymmetric. Supply and demand shocks in Norway are only highly correlated with Denmark and not with any other EU countries. These results suggest that supply shocks are less symmetric in the EU countries than one expects. Similarly, symmetric demand shocks prevail only in sub-grouped EU countries. Demand shocks in Greece and Portugal are not positively correlated with any of the EU countries. Ireland is found to be positively and significantly correlated in demand shocks only with Netherlands. Overall, the results show that the underlying structural shocks are less symmetric in the East Asian economies than in the EU countries.

Table 1: Correlations of Structural Shocks among the East Asian Countries

Panel A: Supply Shocks (1960-1997)   *Panel C: Supply Shocks (1960-2001)*

	C	I	J	K	M	P	S	T	C	I	J	K	M	P	S	T
C	1.00								1.00							
I	-0.19	1.00							-0.09	1.00						
J	0.09	0.21	1.00						0.09	0.25	1.00					
K	0.03	0.21	0.31	1.00					0.02	0.55	0.38	1.00				
M	-0.23	0.37	0.03	0.23	1.00				-0.11	0.68	0.25	0.59	1.00			
P	-0.21	-0.01	0.05	0.22	0.24	1.00			-0.18	0.23	0.12	0.32	0.42	1.00		
S	-0.03	0.02	-0.02	0.16	0.51	0.36	1.00		-0.03	0.28	0.12	0.34	0.62	0.41	1.00	
T	0.23	0.19	0.39	0.31	0.36	0.26	0.15	1.00	0.19	0.59	0.45	0.62	0.72	0.41	0.38	1.00

Panel B: Demand Shocks (1960-1997)   *Panel D: Demand Shocks (1960-2001)*

	C	I	J	K	M	P	S	T	C	I	J	K	M	P	S	T
C	1.00								1.00							
I	-0.32	1.00							0.24	1.00						
J	0.14	-0.01	1.00						0.13	-0.05	1.00					
K	0.00	-0.06	0.27	1.00					-0.05	-0.46	0.29	1.00				
M	0.01	-0.08	0.47	0.03	1.00				-0.02	-0.33	0.46	0.24	1.00			
P	0.03	0.00	0.32	0.10	0.26	1.00			0.03	-0.12	0.33	0.14	0.32	1.00		
S	0.04	0.18	0.61	0.36	0.52	0.16	1.00		0.07	0.01	0.57	0.37	0.48	0.14	1.00	
T	0.05	0.14	0.55	0.07	0.51	0.13	0.68	1.00	0.00	-0.35	0.53	0.42	0.63	0.21	0.62	1.00

Notes: The list of country abbreviations is provided in Appendix 1. The painted figures are those above 0.3.

Table 2: Correlations of Structural Shocks among the European Union Countries

1960-1998

Supply Shocks Correlations

	Aus	Bel	Den	Fin	Fr	Ger	Gre	Ire	Ita	Net	Nor	Por	Spa	Swe	Swit	UK
Aus	1															
Bel	0.59	1														
Den	0.53	0.65	1													
Fin	0.26	0.44	0.43	1												
Fr	0.60	0.76	0.73	0.45	1											
Ger	0.51	0.42	0.48	-0.1	0.39	1										
Gre	-0.03	0.19	0.43	0.23	0.29	0.36	1									
Ire	-0.23	-0.03	-0.03	0.25	-0.09	-0.2	0.09	1								
Ita	0.62	0.81	0.63	0.28	0.75	0.41	0.05	-0.2	1							
Net	0.54	0.71	0.62	0.28	0.60	0.47	0.11	0.04	0.67	1						
Nor	-0.01	0.18	0.33	0.16	-0.1	0.03	0.16	0.11	0.12	0.24	1					
Por	0.6	0.54	0.49	0.14	0.58	0.39	0.24	-0.1	0.64	0.5	-0.09	1				
Spa	0.52	0.65	0.60	0.41	0.54	0.39	0.10	0.13	0.51	0.42	0.12	0.34	1			
Swe	0.15	0.46	0.40	0.67	0.44	0.14	0.21	0.12	0.41	0.38	0.16	0.16	0.19	1		
Swit	0.67	0.61	0.34	0.39	0.53	0.24	-0.1	0.08	0.56	0.62	0.05	0.43	0.43	0.15	1	
UK	0.14	0.21	0.56	0.41	0.43	0.13	0.45	0.09	0.33	0.30	-0.04	0.47	0.26	0.36	0.06	1

Demand Shocks Correlations

	Aus	Bel	Den	Fin	Fr	Ger	Gre	Ire	Ita	Net	Nor	Por	Spa	Swe	Swit	UK
Aus	1															
Bel	0.53	1														
Den	0.52	0.67	1													
Fin	0.28	0.31	0.38	1												
Fr	0.65	0.69	0.72	0.41	1											
Ger	0.51	0.55	0.61	0.09	0.49	1										
Gre	-0.02	-0.1	-0.1	0.1	-0.15	-0.2	1									
Ire	-0.02	0.14	0.01	0.05	0.04	0.04	0.21	1								
Ita	0.52	0.80	0.69	0.17	0.74	0.53	-0.18	0.06	1							
Net	0.49	0.59	0.56	0.16	0.58	0.50	0.06	0.30	0.62	1						
Nor	0.08	0.12	0.58	0.15	0.10	0.25	0.26	0.07	0.18	0.24	1					
Por	0.48	0.61	0.43	0.09	0.61	0.39	-0.1	-0	0.58	0.45	-0.15	1				
Spa	0.50	0.68	0.56	0.40	0.49	0.49	-0.01	0.18	0.56	0.35	0.13	0.32	1			
Swe	0.20	0.48	0.47	0.56	0.52	0.22	-0.13	0.20	0.56	0.48	0.13	0.31	0.32	1		
Swit	0.62	0.55	0.34	0.33	0.57	0.31	0.03	0.31	0.43	0.68	-0.04	0.32	0.39	0.29	1	
UK	0.29	0.40	0.65	0.3	0.59	0.33	-0.22	0.06	0.56	0.46	0.19	0.51	0.35	0.44	0.20	1

Note: The list of country abbreviations is provided in Appendix 1.

Size of Disturbances and Adjustment Speed

Bayoumi and Eichengreen's (1994) methodology also allows us to estimate the relative size of the disturbances and the countries' adjustment speed to the disturbances. A country becomes a better candidate of OCA if the underlying shocks are small. Similarly, the faster the adjustment to disturbances, the smaller will be the cost of renouncing the monetary sovereignty. The size of demand and supply shocks reported in Table 3 is measured by the standard deviations of the underlying shocks. The size of the supply shocks has reportedly increased for Indonesia, Korea, Malaysia and Thailand (most-hit economies by the Asian financial crisis) when the sample period is extended to include periods after the financial crisis. It is evident that East Asia economies have experienced much larger demand shocks than supply shocks. In comparison with the EU countries, the average size of both demand and supply shocks is much larger in East Asia.

A simple measure of the speed of adjustment to supply shocks is the ratio of the impulse response function in the third year to its long run level.[11] The higher the value, the faster the adjustment. Table 3 reports the results.

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[11] Follows the suggestion by Bayoumi and Eichengreen (1993).

Table 4 reports the impulse response of GDP to the supply shocks and table 5 reports the impulse response of prices to the demand shocks for the East Asian countries. The speed of adjustment to demand shocks is measured by taking the value of the impulse response function on the sixth year, with a low value now representing speedy adjustment.[12] The Asian financial crisis increased considerably the speed of adjustment to supply shocks for Indonesia, Malaysia, Singapore and Thailand. However, the financial crisis does not change much the speed of adjustment to the demand shocks. It is evident that the speed of adjustment to both shocks in East Asia is much faster than in the EU region. The difference in adjustment speed can be explained by the higher factor mobility in most East Asian economies. In comparison with the EU at the time of the Maastricht Treaty, ASEAN has relatively high labour mobility as well as capital mobility (Goto and Hamada 1994; Bayoumi and Eichengreen 1999; Moon, Rhee, and Yoon 2000). Goto and Hamada (1994) note the extent of migration between the less- and more-developed East Asian economies and emphasises its responsiveness to changing economic conditions.

CONCLUSION

In this paper we used the Structural VAR approach proposed by Bayoumi and Eichengreen (1993, 1994, 1999) to identify the structural shocks among the East Asian economies, as a preliminary way of examining the desirability of the East Asian economies to an alternative exchange rate arrangement (a monetary union) that can potentially enhance the exchange rate stability and credibility in the region.

In comparison with the EU countries, the underlying structural shocks in East Asia are less symmetric with a larger size on average. However, the speed of adjustment to shocks in East Asia is much faster. The correlations of supply shocks suggest that it is less feasible for the entire East Asian region concerned to form a currency union. However, the results do imply that some sub-groups among some East Asian countries with highly symmetrical permanent supply shocks are better candidates for a currency union. The examination of the pre- and post-crisis data reveals that it was the permanent shocks which affected the region during the crisis. As one would expect, the correlations of supply shocks among the East Asian countries are found to have increased rather significantly after the crisis. In addition, the results indicate that although the financial crisis had increased the size of the supply shocks to the region, the region adjusted to the shocks fairly quickly.

Nevertheless, the drive towards monetary integration will depend on other economic and non-economic factors as well. While political issues are beyond the scope of this paper, it is recognised that East Asian countries lack the political solidarity and cohesion for a monetary union at present (see also Bayoumi and Eichengreen (1999)).

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[12] Bayoumi and Eichengreen (2003) suggest taking the value of the impulse response function after 5 years.

Table 3: Size and Speed of Adjustment

	Aggregate Supply Disturbances		Aggregate Demand Disturbances	
	Size	Speed of Adjustment	Size	Speed of Adjustment
East Asia (1960-1997)				
China	0.057	0.430	0.027	0.0028
Indonesia	0.030	0.385	0.366	0.0792
Japan	0.025	0.361	0.024	0.0018
Korea	0.029	0.209	0.039	0.0050
Malaysia	0.029	0.365	0.046	0.0005
Philippines	0.029	0.428	0.068	0.0049
Singapore	0.043	0.626	0.027	0.0011
Thailand	0.028	0.231	0.040	0.0019
Average	0.034	0.379	0.079	0.0122
East Asia (1960-2001)				
China	0.055	0.463	0.027	0.0029
Indonesia	0.041	1.074	0.356	0.0673
Japan	0.024	0.372	0.023	0.0019
Korea	0.031	0.226	0.036	0.0049
Malaysia	0.044	1.505	0.044	0.0001
Philippines	0.029	0.453	0.065	0.0049
Singapore	0.046	1.294	0.029	0.0006
Thailand	0.035	0.315	0.040	0.0013
Average	0.038	0.713	0.078	0.0105
European Union (1960-1998)				
Austria	0.019	0.192	0.009	0.0010
Belgium	0.020	0.222	0.012	0.0262
Denmark	0.008	0.146	0.010	0.0241
Finland	0.023	0.332	0.024	0.0636
France	0.013	0.256	0.013	0.0051
Germany	0.027	0.404	0.008	0.0015
Greece	0.035	0.535	0.032	0.1146
Ireland	0.024	0.204	0.032	0.0823
Italy	0.021	0.387	0.018	0.0638
Netherlands	0.017	0.194	0.013	0.0292
Norway	0.012	0.210	0.024	0.0016
Portugal	0.026	0.277	0.029	0.0074
Spain	0.018	0.344	0.018	0.0741
Sweden	0.018	0.388	0.017	0.0546
Switzerland	0.022	0.957	0.017	0.0413
UK	0.015	0.244	0.028	0.0753
Average	0.020	0.331	0.019	0.0416

Table 4: Impulse Response of GDP to Supply Shocks

Response to Structural One S.D. Innovations
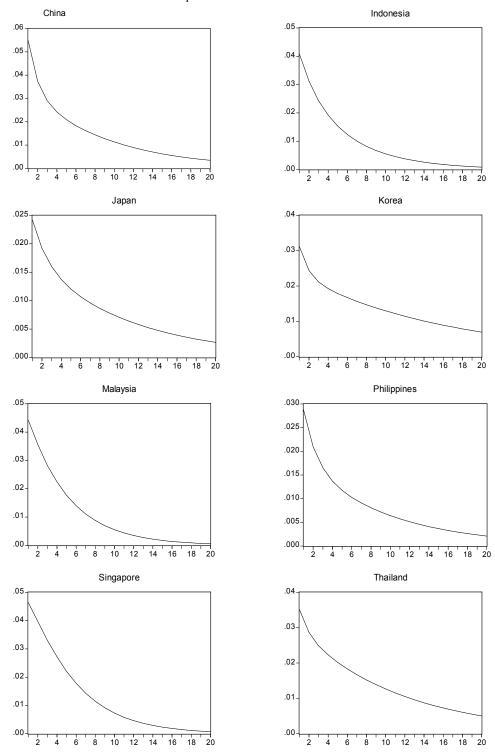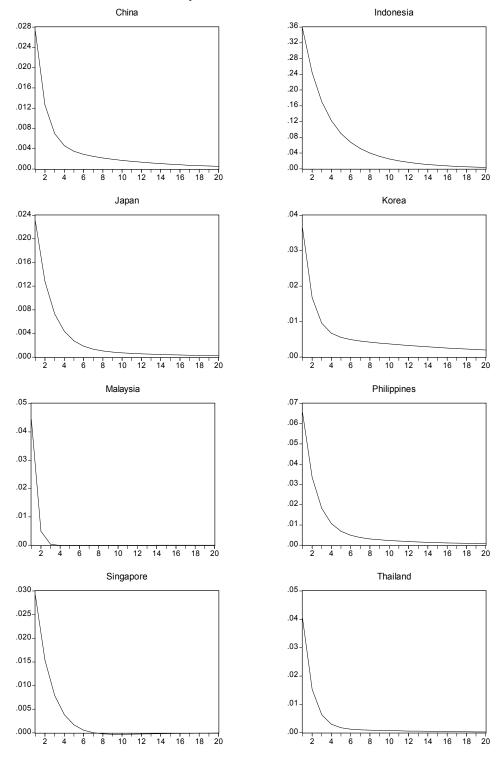
Table 5: Impulse Response of Prices to Demand Shocks

Response to Structural One S.D. Innovations

APPENDIX 1

Country Abbreviations
C	: China
I	: Indonesia
J	: Japan
K	: Korea
M	: Malaysia
P	: Philippines
S	: Singapore
T	: Thailand
Aus	: Austria
Bel	: Belgium
Den	: Denmark
Fin	: Finland
Fr	: France
Ger	: Germany
Gre	: Greece
Ire	: Ireland
Ita	: Italy
Net	: Netherlands
Nor	: Norway
Por	: Portugal
Spa	: Spain
Swe	: Sweden
Swit	: Switzerland
UK	: United Kingdom

APPENDIX 2

Consider a system where the true model can be represented by an infinite moving average representation of a (vector) of variables, X_t, and an equal number of shocks, ε_t. Using the lag operator L, this can be written as:

$$X_t = A_0\varepsilon_t + A_1\varepsilon_{t-1} + A_2\varepsilon_{t-2} + \ldots + A_n\varepsilon_{t-n}$$

$$= \sum_{i=0}^{\infty} L^i A_i \varepsilon_t \tag{1}$$

where the matrices A_i represent the impulse response functions of the shocks to the elements of X. Let X_t (2×1 vector) be made up of Y_t (real GDP) and P_t (CPI) which are both in log-difference form (log Y_t – log Y_{t-1}); ε_t is the demand and supply shocks. The model defined becomes:

$$\begin{bmatrix} Y_t \\ P_t \end{bmatrix} = \sum_{i=0}^{\infty} L^i \begin{bmatrix} a_{11i} & a_{12i} \\ a_{21i} & a_{22i} \end{bmatrix} \begin{bmatrix} \varepsilon_{st} \\ \varepsilon_{dt} \end{bmatrix} \tag{2}$$

ε_{st} and ε_{dt} are independent supply and demand shocks; a_{11i} represents elements in matrix A_i. Since demand shock must cause no change in output in the long run, this implies:

$$\sum_{i=0}^{\infty} a_{11i} = 0 \tag{3}$$

The model defined above can be estimated using a vector autoregression (VAR). Each element of X_t can be regressed on lagged values of all the elements of X. Using B to represent these estimated coefficients, the VAR equation looks like:

$$X_t = B_1 X_{t-1} + B_2 X_{t-2} + \ldots + B_n X_{t-n} + e_t \tag{4}$$

Using the lag operator:

$$X_t \quad = \quad B_1 L X_t + B_2 L^2 X_t + \ldots + B_n L^n X_t + e_t$$

$$= \quad [I - B(L)]^{-1} e_t \tag{5}$$

$$= \quad [I + B(L) + B(L)^2 + \ldots] e_t$$

$$= \quad e_t + D_1 e_{t-1} + D_2 e_{t-2} + D_3 e_{t-3} + \ldots \tag{6}$$

where e_t represents the residuals from the equations in the vector autoregression, i.e., the residuals of the output and price equation, and we label those e_t^y and e_t^p respectively. To recover the structural model from the reduced form model, the residuals from the VAR (e) have to be converted into supply and demand shocks (ε). Note that it is crucial to decompose real GDP growth and inflation shocks because they are combination of supply and demand shocks.

Writing

$$e_t = C\varepsilon_t \tag{7}$$

where C is a 2×2 matrix of some constants, and ε_t is a 2×1 vector comprising of ε_t^s and ε_t^d which are supply shock and demand shock respectively. In order for matrix C to be uniquely defined, four restrictions need to be imposed. The first two are normalisation of covariance matrix of ε_t^s and ε_t^d. This means variances of both ε_t^s and ε_t^d are equal to one. The third restriction is that ε_t^s and ε_t^d are orthogonal, meaning their covariance is zero. These three restrictions imply that the covariance matrix of ε_t^s and ε_t^d is an identity matrix. The final restriction, which allows the matrix C to be uniquely defined, is that demand shocks have only temporary effects on output.[13] The final restriction implies equation (3). In terms of vector autoregression, equation (3) can also be written as:

$$\sum_{i=0}^{\infty} \begin{pmatrix} d_{11i} & d_{12i} \\ d_{21i} & d_{22i} \end{pmatrix} \begin{pmatrix} C_{11i} & C_{12i} \\ C_{21i} & C_{22i} \end{pmatrix} = \begin{pmatrix} 0 & . \\ . & . \end{pmatrix}$$

from equation (5),

$$X_t \quad = \quad [I - B(L)]^{-1} e_t$$

$$= \quad [I - B(L)]^{-1} C\varepsilon_t$$

where 2×2 matrix $\sum D_i$ is equivalent to a 2×2 matrix $[I - B(L)]^{-1}$ of equation (5). In order to calculate for $[I - B(L)]^{-1}$, notice that in the long run at steady state, equation (4) becomes:

$$X_t \quad = \quad B_1 X_t + B_2 X_t + \ldots + B_n X_t + e_t$$

$$X_t \quad = \quad (I - B_1 - B_2 - \ldots - B_n)^{-1} e_t$$

Since $B_1, B_2, \ldots, B_n$ are parameters obtained form running a vector autoregressive equation (4) with an optimal lag length, matrix $\sum D_i$ can now be calculated. Thus the fourth restriction is:

$$d_{11i} * C_{11} + d_{12i} * C_{21} = 0 \tag{8}$$

Let's define $\sum_e$ to be a 2×2 covariance matrix of e_t^y and e_t^p and $\sum_\varepsilon$ to be a 2×2 covariance matrix of ε_t^s and ε_t^d. As a result of restrictions 1 to 3, $\sum_e$ and $\sum_\varepsilon$ are just a 2×2 identity matrix. Then from $e_t = C\varepsilon_t$, we know that e_t is just a linear combination of ε_t. We can thus derive:

$$\sum_e = C \sum_\varepsilon C^T \tag{9}$$

where C^T is a transpose of matrix C. After some matrix multiplications, we obtain the following equations:

$$C_{11}^2 + C_{12}^2 = Var(e_t^y) \tag{10}$$

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[13] This is where Bayoumi's analysis, based on the work of Blanchard and Quah (1989), differs from other VAR models. The usual decomposition assumes that the variables in the VAR can be ordered such that all the effects which could be attributed to (say) either a_t or b_t are attributed to whichever comes first in the ordering. This is achieved by a Choleski decomposition (Sims, 1980).

$$C_{11}C_{21} + C_{12}C_{22} = Cov\left(e_t^y, e_t^p\right) \tag{11}$$

$$C_{21}^2 + C_{22}^2 = Var\left(e_t^p\right) \tag{12}$$

We now have four equations in four unknowns in (8), (10), (11) and (12), so matrix C can be determined uniquely. Equation (7) can also be written as:

$$C^{-1} e_t = \varepsilon_t \tag{13}$$

where C^{-1} is the inverse of matrix C. Finally, we can calculate for ε_t^s and ε_t^d directly from equation (13).

REFERENCES

Bayoumi, T. (1992), "The Effects of the ERM on Participating Countries", *International Monetary Fund Staff Papers*, 39, 330-356.

Bayoumi, T. (1994), "A Formal Model of Optimum Currency Areas*", International Monetary Fund Staff Papers*.

Bayoumi T. and Eichengreen, B. (1993), "Shocking Aspects of European Monetary Unification", in F. Torres and F. Giavazzi, (eds.), *Adjustment and Growth in the European Monetary Union*, Cambridge, Cambridge University Press.

Bayoumi T., and Eichengreen, B (1994), "One Money or Many? Analyzing the Prospects for Monetary Unification in Various Parts of the World", *Princeton Studies in International Finance*, No. 76.

Bayoumi, T., and Eichengreen, B. (1999), "Is Asia an Optimum Currency Area? Can It Become One? Regional, Global and Historical Perspectives on Asian Monetary Relations", in S.Collignon, J. Pisani-Ferry, and Y.C. Park, eds., *Exchange Rate Policies in Emerging Asian Countries*, London: Routledge, 347-66.

Bayoumi, T. and Mauro, P (1999), "The Suitability of ASEAN for a Regional Currency Arrangement", *International Monetary Fund Working Paper*, WP/99/162.

Blanchard, O. and Quah, D. (1989), "The Dynamic Effects of Aggregate Demand and Supply Disturbances", *American Economic Review*, 79, 655-73.

Goto, J. and Hamada, K. (1994), "Economic Preconditions for Asian Regional Integration" In T. Ito and A. O. Krueger (Eds.), *Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows*, Chicago: University of Chicago Press, 359-85.

Kenen, P. (1967), "Toward a Supranational Monetary System", in G. Pontecorvo, R. P. Shay, and A. G. Hart, (eds.), *Issues in Banking and Monetary Analysis*, Holt, Reinhart, and Winston: New York.

McKinnon, R. (1963), "Optimum Currency Areas", *American Economic Review*, 53, 717-25.

Moon, W.S., Rhee, Y., and Yoon, D.R. (2000), "Asian Monetary Cooperation: A Search for Regional Monetary Stability in the Post Euro and the Post Asia Crisis Era". *Economic Papers* 3(1),159-93.

Mundell, A. R. (1961), "A Theory of Optimum Currency Areas", *American Economic Review*, 51(4), 657-65.

Ricci, L. (1997), "A Model of an Optimum Currency Area", *IMF Working Paper*, 97/76.

Sims, C. (1980), "Macroeconomics and Reality," *Econometrica*, 48, 1-49.

Williamson, J. (1999), "The Case for a Common Basket for East Asian Currencies", In S.Collignon, J. Pisani-Ferry, and Y.C. Park, eds., *Exchange Rate Policies in Emerging Asian Countries*. London: Routledge, 327-346.

Exchange Rate Misalignments in ASEAN-5 Countries

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ABSTRACT

The purpose of this paper is to estimate the exchange rate misalignments for Indonesia, Malaysia, Philippines, Singapore and Thailand before the currency crisis. By employing the sticky-price monetary exchange rate model in the environment of vector error-correction, the results indicate that the Indonesia rupiah, Malaysian ringgit, Philippines peso and Singapore dollar were overvalued before the currency crisis while Thai baht was undervalued on the eve of the crisis. However, they suffered modest misalignment. Therefore, little evidence of exchange misalignment is found to exist in 1997:2. In particular, Indonesia rupiah, Malaysia ringgit, Philippines peso and Singapore dollar were only overvalued about 1 to 4 percent against US dollar while the Thai baht was only 2 percent undervalued against US dollar.

INTRODUCTION

During the 1980s and early 1990s, the Southeast Asia's enjoyed rates of growth of nearly 8% a year. However, the impressive growth had dramatically changed in 1997. Massive attacks on Thai baht took place on 14 and 15 May 1997, forcing the Bank of Thailand to float baht on 2 July 1997. At first, the economic crisis was limited to Thailand's financial sector, but it quickly grew to engulf Malaysia and Indonesia as well.

Many studies have tried to figure out the causes of Asian currency crisis. The "fundamentalist" view of Corsetti *et al.* (1998) suggests that the crisis was due to the structural weaknesses prevalent in the domestic financial institutions together with unsound macroeconomic policies. A view put forward by Radelet *et al.* (1998) tells the story of "financial panic". One of the principal policy mistakes in the region, which is highlighted by a few observers (Hill, 1998; Nidhiprabha, 1998; Sadli, 1998 and Athukorala, 1998), was the commitment to a rigidly fixed exchange rate or quasi-fixed exchange rates, in which the effective weight of the US dollar in the basket was so high that it could be characterized as an implicit peg to the US currency. It is believed that the pegged to US dollar would help to ensure their currencies stability, however, a robust US economy in recent years had strengthened the dollar which had led many investors to believe that ASEAN currencies were overvalued.

Generally, this paper aims to determine the exchange rates for ASEAN countries before the currency crisis to see whether there is any currency misalignment by using the monetary exchange rate model and vector error-correction techniques.

The outline of the remainder of the paper is as follows. Section 2 provides a background on the economics situation of the ASEAN five countries. In Section 3, we will review some empirical analyses on ASEAN exchange rates misalignment before the currency crisis. Section 4 describes the model, methodology and data set used. Empirical results are presented in Section 5. Finally, Section 6 gives the concluding remarks.

BACKGROUND

During 1970-96, the ASEAN economies grew by an average of 6.6% per annum. Singapore recorded a notable rate of growth averaging 8.5% per annum during the period of 1976-97, with the exception of the two recession years between 1985-86. And the real Gross Domestic Product (GDP) of Malaysia, Thailand and Indonesia had grown at an average rate of 7-8% during the late 1980's until the mid 1997. Unlike the other four ASEAN countries, the Philippines did not record impressive GDP growth rates during the early 1990's due to major political and economic crisis. The economy was only picking up after 1993 with an annual growth of GDP averaged 4-5% during 1994-97.

Table 1: Gross Domestic Product Growth Rates (%) of ASEAN Countries, 1980-2002

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Indonesia	9.8	8.0	2.2	4.1	7.1	2.3	5.9	4.9	5.9	7.5	7.3	6.9
Malaysia	7.6	7.0	5.8	6.4	7.6	-1.0	1.1	5.4	8.9	9.1	9.8	8.5
Philippines	5.1	3.4	3.7	1.8	-7.3	-7.3	3.4	4.3	6.8	6.2	3.0	-0.6
Singapore	9.4	9.8	7.0	8.1	8.2	-1.6	2.3	9.7	11.7	9.6	9.1	7.3
Thailand	5.1	5.8	5.5	5.5	5.7	4.6	5.7	9.3	13.4	12.2	11.1	8.6
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Indonesia	6.5	6.4	7.6	8.3	8.0	4.6	-13.6	1.3	4.9	3.4	3.7	
Malaysia	7.8	8.4	9.2	9.4	8.6	7.7	-6.5	5.8	8.0	0.3	4.1	
Philippines	0.3	2.1	4.4	4.7	5.8	5.2	-0.4	3.2	4.4	4.5	4.4	
Singapore	6.2	10.5	10.4	8.7	7.8	6.8	1.7	5.4	9.4	-2.4	2.2	
Thailand	8.1	8.7	8.6	8.8	5.5	-0.4	-10.2	3.3	4.6	1.9	5.3	

Sources: International Financial statistics, National's Economic Reports, various issues.

As the economies experienced unprecedented growth in the last decade, the region also saw continuing development and liberalization in the financial system. After the total collapse of the Bretton Woods system in March 1973, the South East Asia countries then evolved into a generalized floating exchange rate system. Before the onset of currency crisis, Indonesia peg her currency to US dollar, Malaysia and Thailand peg their currencies to a basket of their respective trading partners' currencies. While Singapore practised the managed float system and the Philippines adopted an almost fixed nominal exchange rate regime. Following the speculative attacks and abandonment of the baht, the contagion effects swept across the region. Their currencies depreciated sharply and the exchange rates systems together with a fairly open capital account which they maintained for the past decade was not sustainable. Malaysia opted to close their capital accounts significantly while the other four major Southeast Asian economies have adopted floating regimes.

LITERATURE REVIEWS

There is a wealth of both theoretical and empirical literature on the determinants of exchange rates or exchange rate misalignments. Regardless of the specific approach in modelling exchange rate determination, to measure misalignment the equilibrium exchange rate must be ascertained. This section reviews some empirical studies of Asian exchange rate misalignments before the 1997 crisis.

Husted and MacDonald (1999) employed panel cointegration in the unrestricted version of flexible price monetary model to estimate the equilibrium exchange rates for nine Asian countries. They found little evidence of misalignment among nine Asian currencies. They report only the Malaysian ringgit was overvalued and the Indonesian rupiah was undervalued at end of 1996.

Similar studies have been done by Furman and Stigliz (1998) and Sazanami and Yoshimura (1999) where Furman and Stigliz (1998) employed purchasing power parity (PPP) in long-run averaging ("stylized facts" base period) to estimate the exchange rate misalignments for Indonesia, Malaysia, Philippines, Singapore, Thailand and other developing countries while Sazanami and Yoshimura (1999) used mean reverting as base period to measure currencies overvaluation for Indonesia, Korea, Malaysia, Philippines and Thailand. Both studies found that Thai baht, Philippines peso and Malaysia ringgit were overvalued on the eve of the currency crisis. Furman and Stigliz (1998) found Indonesia rupiah was overvalued while Sazanami and Yoshimura (1999) found Indonesia rupiah was undervalued in 1997. In addition, Furman and Stigliz (1998) found Singapore dollar was overvalued at Jan-June 1997.

Chinn (1998), Chinn and Dooley (1999) and Chinn (2000a) measured Asian currencies overvaluation with different approaches. First, they tested PPP model using producer price indices (PPI) deflated and consumer price indices (CPI) deflated estimates. Both models provide consistent results of overvaluation for Malaysia ringgit, Philippine Peso and Thai baht but contradict results for Singapore dollar and Indonesia rupiah where PPI deflated indicated that Singapore dollar and Indonesia rupiah were undervalued while CPI deflated suggests that Singapore dollar and Indonesia rupiah were overvalued. Secondly, by utilizing the productivity-based model i.e. augmented Balassa-Samuelson model, they found overvaluation for Philippine Peso, Singapore dollar and Thai baht, and undervaluation for Indonesia rupiah and Malaysia ringgit. Finally, augmented productivity trends in monetary model, they found rupiah was overvalued and Singapore dollar was undervalued on the eve of the currency crisis.

Using intertemporal optimization model (cointegration technique); unobserved component trend and cyclical model (Kalman Filter technique); and Blanchard and Quah macroeconomic model (structural vector autoregressive technique), Saxena (2002) consistently found overvaluation of rupiah against USD in 1997.

Employing equilibrium real exchange rate model, Kwek and Yoong (2002) found that ringgit was undervalued before the currency crisis.

MODEL, METHODOLOGY AND DATA

This section summarizes the model, method and data being used in this study. First, the monetary exchange rate determination model is briefly discussed. Next, we will describe the methodology being employed in this study, which consists of unit root test and Johansen multivariate cointegration techniques. Followed by a specification of sticky-price monetary model in vector error-correction model (VECM), which will be used to measure exchange rate valuation. Finally, the data being used in this study will be listed.

Model

Two representative nominal exchange rate models in the literature are the flexible-price (Frenkel-Bilson) monetary model and the sticky-price (Dornbusch-Frankel) monetary model. All monetary models rely on the twin assumptions of purchasing power parity holds continuously and the existence of stable money demand functions for the domestic and foreign economies. The reduced form of the monetary models of exchange rate determination can be written as follows:

$$e_t = \gamma_0 + \gamma_1(m_t - m_t^*) + \gamma_2(y_t - y_t^*) + \gamma_3(r_t - r_t^*) + \gamma_4(\pi_t - \pi_t^*) + \varepsilon_t \tag{1}$$

where $\gamma_1 = 1$, $\gamma_2 < 0$, $\gamma_3 > 0$, and $\gamma_4 = 0$ for flexible-price monetary model while $\gamma_1 = 1$, $\gamma_2 < 0$, $\gamma_3 < 0$, and $\gamma_4 > 0$ for sticky-price monetary model. e_t is the spot exchange rate (defined as the price of a unit of foreign money in terms of domestic money), m_t is the domestic money supply, y_t is the domestic real income, r_t is the domestic interest rate, π_t is the domestic expected inflation rate, ε_t is the error term, while an asterisk denotes the corresponding foreign variables, and all variables except for interest rate and expected inflation rate, are expressed in natural logarithms. The sticky-price monetary model is being used in this study since the flexible-price monetary model is nested in the sticky-price monetary model.

Methodology

In this study we first examine the time series properties. In order to determine the order of integration, the standard Augmented Dickey-Fuller (ADF) unit root test will be used for testing the null of nonstationarity. If the series are of same order, then we may proceed to test the existence of cointegrating relations between the exchange rate and its fundamentals using Johansen multivariate cointegration techniques. The tests used are the trace statistic, which tests for at most r cointegrating vectors among a system of *n* time series (where *r = 0, 1, 2, . . . , n − 2, n − 1*). If we are able to reject the null hypothesis of no cointegrating vectors, this indicates the exchange rate and its monetary fundamentals have a stable long run relationship. According to the Granger Representation Theorem, if a cointegrating relationship exists between a series of *I(1)* variables, then an error-correction model (ECM) also exists[1]. This suggests that there should exist an exchange rate equation of the form:

$$\nabla e_t = c + \sum_{u}^{t=0} L^{\Pi} \nabla e_{t-1-l} + \sum_{u}^{t=0} L^{2l} \nabla (m - m_*)_{t-l} + \sum_{u}^{t=0} L^{3l} \nabla (y - y_*)_{t-l} + \sum_{u}^{t=0} L^{3l} \nabla (r - r_*)_{t-l}$$

$$+ \sum_{u}^{t=0} L^{2l} \nabla (\pi - \pi_*)_{t-l} + \Pi Z_{t-1} + \varepsilon_t \tag{2}$$

where *c* denotes a constant, μ_t denotes an error term, Z_t represents the cointegrating vector normalized on e_t and *Π*-matrix captures the adjustment of the exchange rate towards its long-run equilibrium value. $\Pi = \alpha\beta'$, where α represents the speed of adjustment to disequilibrium while β is a matrix of long-run coefficients such that the term βZ_t embedded in equation (2) represents up to (*n - 1*) cointegration relationships in the multivariate model which ensure that the Z_t converge to their long-run steady-state solutions.

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[1] An ECM is a model, which uses the lagged residual from the cointegrating regression in combination with short-run dynamics to adjust the model towards long-run equilibrium (Tawadros, 2001).

Next, following the general-to-specific methodology, the final parsimonious VECM monetary models are obtained. These final parsimonious specifications can be achieved by removing the insignificant regressors[2]. The resultant models should be checked in terms of diagnostics tests. Finally, the estimated vector error-correction models are used to determine the exchange rates before the currency crisis to see whether there is any currency misalignment for ASEAN five countries.

Data

All the data series were obtained from various issues of the International Monetary Fund's International Financial Statistics yearbook. The data was collected at the quarterly frequency from 1980:1 to 2003:2. Data during the flexible exchange rate period and before the currency misalignment (Sazanami and Yoshimura (1999); Husted and MacDonald (1999); Furman and Stigliz (1998); Chinn and Dooley (1999), Chinn (2000a and b)) i.e. 1980:1 to 1995:1 was used to formulate models (except 1985:4 to 1995:1 for Thailand), while the data from 1995:2 onwards is set aside for comparison and for out-sample forecasting exercises.

Exchange rates (ER) are quarterly averages in terms of RM/USD, Rupiah/USD, Peso/USD, Singapore Dollar/USD and Baht/USD. The chosen monetary aggregates are broad money stock (M2). The industrial product indices (IPI) are utilized as proxies for domestic output/income. The interest rates are the short-term market rates (MR) (except quarterly averages of three-month treasury bill rates (TB3) is used in the case of Philippines where the MR is not available). Preceding 4 quarters growth in consumer price indices (CPI) are used for the unobservable expected inflation rate. All variables are in natural logarithmic form (except interest rate and expected inflation rate), while an asterisk denotes a series corresponding to the US.

RESULTS AND DISCUSSION

Table 2 reports the unit root test results. For all five countries, the results clearly show that the null hypothesis of a unit root cannot be rejected at the 1% level for all variables in their levels. However, the null hypothesis is rejected at 5% level when all variables have been tested in their first-differences. Thus, these indicate that all variables are integrated of order one, $I(1)$.

Table 2: Augmented Dickey-Fuller Unit Root Tests

A: Indonesia				
Series	Lag Length	Level	Lag Length	First-Difference
e	4	-1.1523	2	-4.6664[a]
m-m*	1	-2.9567	2	-4.5542[a]
y-y*	4	-1.6843	2	-6.0209[a]
r-r*	5	-2.0331	4	-5.4249[a]
π-π*	9	-1.3565	8	-6.5817[a]

B: Malaysia				
Series	Lag Length	Level	Lag Length	First-Difference
e	1	-2.0865	2	-4.6186[a]
m-m*	1	-2.2151	2	-4.8107[a]
y-y*	8	-2.5200	1	-8.0023[a]
r-r*	3	-2.3840	2	-4.5454[a]
π-π*	9	-2.5062	7	-5.1739[a]

C: Philippines				
Series	Lag Length	Level	Lag Length	First-Difference
e	2	-1.7000	1	-2.9429[b]
m-m*	9	-3.4284	2	-4.6887[a]
y-y*	3	-1.4263	2	-3.0376[b]
r-r*	1	-2.4119	3	-4.8297[a]
π-π*	7	-3.1017	7	-3.6641[a]

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[2] In order to avoid mispecifibation, at least one of the lag variable (with largest t-ratio) will be retained in the case of all the lagged variables are not significant.

Table 2: Augmented Dickey-Fuller Unit Root Tests (continued)

D: Singapore

Series	Lag Length	Level	Lag Length	First-Difference
e	2	-0.4307	1	-6.8436 [a]
m-m*	1	-3.4062	2	-4.3336 [a]
y-y*	8	-3.1497	4	-3.3054 [b]
r-r*	5	-3.2350	4	-3.1055 [b]
π-π*	5	-3.4429	7	-5.4014 [a]

E: Thailand

Series	Lag Length	Level	Lag Length	First-Difference
e	4	-3.1963	4	-4.1531 [a]
m-m*	5	-3.2525	2	-3.0954 [b]
y-y*	1	-1.9583	1	-4.2106 [a]
r-r*	6	-2.0699	5	-3.9554 [b]
π-π*	4	-3.0968	8	-4.3952 [a]

Notes: Figures are the pseudo t-statistics for testing the null hypothesis that the series is nonstationary. a and b denotes significance at 1% and 5% levels. For series in level (constant with trend), the critical values for rejection are –4.11, and -3.48 at 1% and 5%. For series in first-difference (constant without trend), the critical values for rejection are -3.54 and -2.91 at 1% and 5%. e ,m, m*, y and y* series are log transformed.

Since the series are of same order, we may proceed to test the existence of cointegrating relations between the exchange rate and its fundamentals using Johansen multivariate cointegration techniques. The results of Johansen-Juselius likelihood cointegration test are reported in Table 3. The test used is the trace statistic, which tests for at most 4 cointegrating vectors among a system of 5 time series. In all five countries, there is evidence of cointegrating vector(s) according to the asymptotic critical values.

Table 3: Johansen-Juselius Likelihood Cointegration Tests

A: Indonesia

Null Hypotheses	Eigenvalue	Trace Statistic	Critical Value (5%)	Critical Value (1%)
(r = 0) [a]	0.588955	114.7486	68.52	76.07
(r ≤ 1) [a]	0.465224	65.85067	47.21	54.46
(r ≤ 2) [b]	0.282298	31.42575	29.68	35.65
(r ≤ 3)	0.211880	13.18220	15.41	20.04
(r ≤ 4)	0.001570	0.086400	3.76	6.65

B: Malaysia

Null Hypotheses	Eigenvalue	Trace Statistic	Critical Value (5%)	Critical Value (1%)
(r = 0) [a]	0.610479	102.0625	68.52	76.07
(r ≤ 1)	0.324670	44.54945	47.21	54.46
(r ≤ 2)	0.181162	20.60366	29.68	35.65
(r ≤ 3)	0.124548	8.411612	15.41	20.04
(r ≤ 4)	0.004868	0.297670	3.76	6.65

C: Philippines

Null Hypotheses	Eigenvalue	Trace Statistic	Critical Value (5%)	Critical Value (1%)
(r = 0) [a]	0.837129	174.3355	68.52	76.07
(r ≤ 1) [a]	0.497084	63.63281	47.21	54.46
(r ≤ 2)	0.166683	21.70557	29.68	35.65
(r ≤ 3)	0.146387	10.58273	15.41	20.04
(r ≤ 4)	0.015095	0.927843	3.76	6.65

D: Singapore

Null Hypotheses	Eigenvalue	Trace Statistic	Critical Value (5%)	Critical Value (1%)
(r = 0) [a]	0.692758	157.3696	68.52	76.07
(r ≤ 1) [a]	0.578810	85.38228	47.21	54.46
(r ≤ 2) [b]	0.317258	32.63729	29.68	35.65
(r ≤ 3)	0.138731	9.357341	15.41	20.04
(r ≤ 4)	0.004043	0.247097	3.76	6.65

Table 3: Johansen-Juselius Likelihood Cointegration Tests (continued)

E: Thailand

Null Hypotheses	Eigenvalue	Trace Statistic	Critical Value (5%)	Critical Value (1%)
$(r = 0)^b$	0.500524	72.19497	68.52	76.07
$(r \leq 1)$	0.415107	45.81557	47.21	54.46
$(r \leq 2)$	0.349695	25.43518	29.68	35.65
$(r \leq 3)$	0.200716	9.083256	15.41	20.04
$(r \leq 4)$	0.014882	0.569755	3.76	6.65

Notes: r indicates the number of cointegrating vectors. a and b denotes rejection of the hypothesis at 1% and 5% critical values. Model included 4 lags on each variable for Indonesia, Malaysia, Singapore and Thailand and 6 lags for the Philippines. Trend and seasonal dummies are not included in this test since they had been dropped in the parsimonious model although they had been considered in the preliminary analyses.

Table 4 reports estimates of the long run parameters of the monetary models among ASEAN five countries. Generally, the results are in support of monetary model. In particular, the coefficients on money, income and interest rate differentials are all correctly signed and statistically significant for Singapore. Overall, the variable that performs best is the income differentials, with three of five coefficients are correctly signed. Followed by the money and interest rate differentials, which have two of five coefficients that are correctly signed. The variable that performs least well is the expected inflation rate differential.

Table 4: Estimated Long Run Parameters of the Monetary Models

Coefficient (SE)	Expected Sign	Indonesia	Malaysia	Philippines	Singapore	Thailand
e	1	1.00	1.00	1.00	1.00	1.00
m-m*	-	-0.22^a (0.01)	0.02 (0.08)	-0.10^b (0.05)	-0.54^a (0.06)	0.05^a (0.01)
y-y*	+	0.17^a (0.05)	-0.27^b (0.13)	-0.41^a (0.10)	1.03^a (0.11)	0.20^a (0.04)
r-r*	+	-0.35^a (0.10)	0.04 (0.08)	-0.88^b (0.42)	2.90^b (1.14)	-0.35^a (0.07)
$\pi-\pi$*	-	0.001^c (0.00)	0.05^a (0.01)	0.01^a (0.00)	0.04^a (0.01)	0.004^a (0.002)

Notes: Coefficient is the β coefficient from monetary cointegrating vector normalized on the exchange rate. SE is the standard error. a, b and c denotes significance at 1%, 5% and 10% levels, respectively. Model included 4 lags for Indonesia, Malaysia, Singapore and Thailand and 6 lags for the Philippines. Trend and seasonal dummies are not included in this test since they had been dropped in the parsimonious model although they had been considered in the preliminary analyses.

Table 5 reports the final parsimonious VECM models for ASEAN five countries from 1980:1 to 1995:1. Overall, the models passed all the diagnostics tests. The Jarque-Bera statistics shows that we cannot reject the null hypotheses of residuals are normally distributed. The Breusch-Godfrey statistics indicate that we couldn't reject the null hypotheses of no serial correlation. The non-significant of ARCH tests statistics imply that ARCH were appropriate. The Ramsey RESET tests indicate that there were no misspecification of omitted variables, incorrect functional forms and correlation between the independent variables and the error terms. White tests show that the residuals are homoskedastic. The results also show that all the coefficients for error-correction term (ECT) are correctly sign and statistically significant. The exchange rates respond to the error correction terms by moving to reduce the disequilibrium. The rates of response are very rapid in the cases of Indonesia (0.84), Thailand (0.72) and Philippines (0.44). The speed of adjustments for Malaysia and Singapore slower: 0.10 and 0.08 respectively.

In order to determine the equilibrium exchange rates before the currency crisis to see whether there is any currency misalignment, out of sample forecast for exchange rates are made using the actual data for the explanatory variables. In other words, the models are estimated with known explanatory variables. Using the final parsimonious models obtained, the in sample and out of sample predictions for Indonesia rupiah, Malaysia ringgit, Philippines peso, Singapore dollar and Thai baht are generated. Evidences of the goodness of fit are revealed in Figure 1 – Figure 5. In virtually, the models fit the data very closely through out the period before currency crisis. The models track the actual exchange rate well and manage to get a considerable number of turning points correct.

Table 5: Final Parsimonious VECM Models for ASEAN five countries

Variables	Expected Sign	Coefficient (SE)				
		Indonesia	Malaysia	Philippines	Singapore	Thailand
ECT	-	-0.838 [a] (0.015)	-0.102 [a] (0.016)	-0.437 [a] (0.071)	-0.083 [a] (0.030)	-0.722 [a] (0.083)
e_{t-1}	-	-0.166 [a] (0.018)	-0.341 [a] (0.066)	0.237 [b] (0.098)		
e_{t-2}	-	-0.106 [a] (0.018)		0.732 [a] (0.099)		-0.147 [c] (0.073)
e_{t-3}	-	-0.087 [a] (0.019)			0.141 (0.130)	
$(m-m^*)_{t-1}$	+	-0.142 [a] (0.014)				
$(m-m^*)_{t-2}$	+	-0.092 [a] (0.014)			0.038 (0.070)	-0.121 [a] (0.041)
$(m-m^*)_{t-3}$	+	-0.064 [a] (0.014)	0.178 [a] (0.044)			
$(m-m^*)_{t-4}$	+			-0.044 (0.069)		
$(y-y^*)_{t-1}$	-	0.078 [a] (0.009)				
$(y-y^*)_{t-2}$	-				0.099 [c] (0.056)	
$(y-y^*)_{t-3}$	-		0.008 (0.032)			0.136 [b] (0.055)
$(y-y^*)_{t-4}$	-			0.391 [a] (0.140)		
$(r-r^*)_{t-1}$	-	-0.241 [a] (0.024)	0.184 [c] (0.095)	-0.546 [a] (0.170)		-0.212 [a] (0.057)
$(r-r^*)_{t-2}$	-	-0.140 [a] (0.025)		-0.465 [a] (0.153)	0.520 [c] (0.310)	
$(r-r^*)_{t-3}$	-	-0.076 [a] (0.023)				
$(\pi-\pi^*)_{t-1}$	+			0.002 [b] (0.001)	-0.004 [c] (0.002)	0.004 [a] (0.001)
$(\pi-\pi^*)_{t-2}$	+			0.002 [a] (0.001)	0.005 [c] (0.003)	
$(\pi-\pi^*)_{t-3}$	+	-0.0002 (0.0003)	0.009 [a] (0.002)	0.002 [a] (0.001)		
$(\pi-\pi^*)_{t-4}$	+			0.002 [b] (0.001)		
c		-0.368 [a] (0.007)		-0.152 [a] (0.029)	-0.006 [c] (0.003)	-0.018 [a] (0.003)
D832		0.329 [a] (0.006)				
D834				0.192 [a] (0.035)		
D864		0.266 [a] (0.006)				
FL892						0.021 [a] (0.003)
FL921						0.015 [a] (0.003)
D1		0.018 [a] (0.002)				
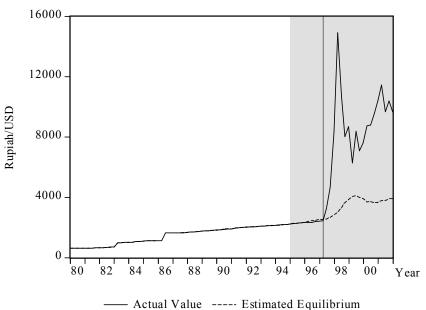
Table 5: Final Parsimonious VECM Models for ASEAN five countries (continued)

Variables	Expected Sign	Coefficient (SE)				
		Indonesia	Malaysia	Philippines	Singapore	Thailand
D2			0.060 [a]			
			(0.006)			
D3						0.015 [a]
						(0.003)
Diagnostic Tests						
R^2		0.990	0.786	0.651	0.249	0.822
Adjusted R^2		0.986	0.762	0.563	0.150	0.765
SE of regression		0.005	0.017	0.037	0.022	0.005
JB Normality		0.120	3.252	1.142	1.016	1.534
		F-stat	**F-stat**	**F-stat**	**F-stat**	**F-stat**
LM		0.644	2.019	0.211	0.271	1.458
RESET		2.021	1.538	1.669	0.966	0.542
White		1.295	1.395	1.157	1.302	1.750
ARCH (1)		0.030	1.062	1.373	0.612	1.581
In Sample Forecast						
RMSE		0.004	0.016	0.033	0.020	0.004

Notes: SE is the standard error. JB is Jarque-Bera statistic for normality. LM is the Breusch-Godfrey Lagrange multiplier test for serial correlation up to 4 lags (except 6 lags for Philippines), RESET is Ramsey RESET test for functional misspecification, White is White's test for general heteroskedasticity and ARCH is the ARCH procedure tests for autoregressive conditional heteroskedasticity with number of lagged residual included in parentheses. The F-statistics reported for LM, RESET, White and ARCH are under the relevant null hypothesis that absence of serial correlation, functional misspecification, heteroscedasticity and ARCH. a, b and c denotes significance at 1%, 5% and 10% level, respectively. Model included 4 lags on each variable for Indonesia, Malaysia, Singapore and Thailand and 6 lags for the Philippines. D832, D834 and D864 are dummy variables to account for exchange rate devaluation while FL892 FL921 are dummy variables to account for financial liberalization (which take on the value of 1 from that date onwards and zero otherwise). D1, D2 and D3 are dummy variables introduced to correct for normality. (D1 = 1 in 1981:1, 1983:1, 1994:2, 1994:3; D1 = -1 in 1981:3, 1984:2, 1991:1, 1992:4, 1993:1, 1993:2 and zero in all other quarters). (D2 = 1 in 1985:1, 1986:2, 1991:2, 1993:1, 1994:1; D2 = -1 in 1980:2, 1986:4, 1992:1, 1992:2, 1992:4 and zero in all other quarters). (D3 = 1 in 1990:1, 1991:2, 1992:1; D3 = -1 in 1987:4, 1994:3 and zero in all other quarters). Trend and seasonal dummies are not included in this test since they had been dropped in the parsimonious model although they had been considered in the preliminary analyses.

Figure 1: Actual and Estimated Equilibrium Exchange Rates for Indonesia
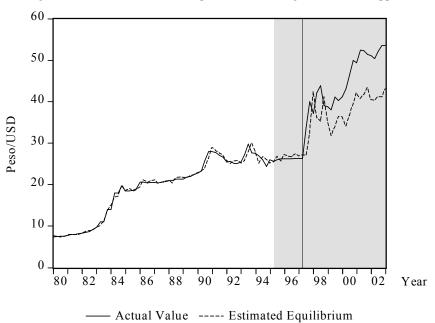
── Actual Value ----- Estimated Equilibrium

Figure 2: Actual and Estimated Equilibrium Exchange Rates for Malaysia

Figure 3: Actual and Estimated Equilibrium Exchange Rates for Philippines
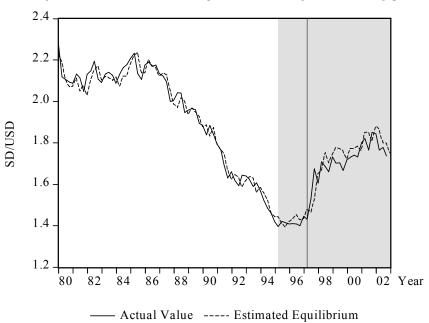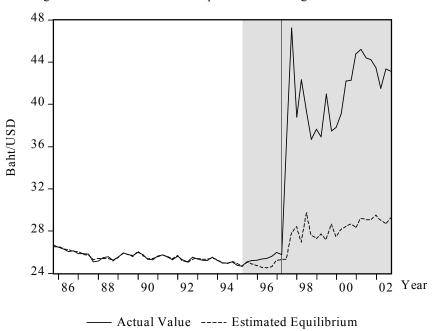
Figure 4: Actual and Estimated Equilibrium Exchange Rates for Singapore

—— Actual Value   ----- Estimated Equilibrium

Figure 5: Actual and Estimated Equilibrium Exchange Rates for Thailand

—— Actual Value   ----- Estimated Equilibrium

The resulting residuals between the actual and the estimated equilibrium exchange rates are the estimated misalignment. Table 6 shows the results of exchange rate misalignments for ASEAN five countries before the currency crisis. The results show that the Indonesia rupiah was overvalued from 1995:1 to 1997:2, Malaysia ringgit was overvalued from 1996:1 to 1997:2, except for 1996:4, Philippines peso was overvalued from 1996:1 to 1997:2, Singapore dollar was overvalued from 1996:1 to 1997:2, except for 1997:1 and Thai baht was undervalued from 1995:2 to 1997:2. However, they suffered only modest misalignment. As expected, the residuals are quite small since these figures represent the deviations from short-run equilibrium. Very little evidence of exchange misalignment is found to exist in 1997:2. In particular, Indonesia rupiah, Malaysia ringgit, Philippines peso and Singapore dollar were only overvalued about 4%, 1%, 3% and 4%, respectively, against USD while the Thai baht was only 2% undervalued against USD.

Table 6: ASEAN Five Countries Exchange Rate Misalignments (%) before Crisis

	Indonesia	Malaysia	Philippines	Singapore	Thailand
1995:2	-1.11	-3.64	0.18	-3.22	0.08
1995:3	-0.47	1.14	-2.93	0.52	0.06
1995:4	-0.28	2.35	1.71	1.47	1.20
1996:1	-0.30	-0.47	-3.94	-0.86	2.04
1996:2	-1.55	-3.15	-2.31	-1.79	3.22
1996:3	-3.84	-2.16	-1.90	-3.18	3.58
1996:4	-4.05	1.38	-4.29	-2.08	3.94
1997:1	-3.77	-1.98	-2.33	0.75	3.04
1997:2	-3.24	-0.18	-2.80	-3.25	1.94

Notes: Figures are exchange rate misalignments in percentage (%). Misalignment is the residual between actual and predicted values of exchange rate. Positive (negative) value for residual denotes an undervaluation (overvaluation).

Table 7 shows the comparison studies of ASEAN exchange rate misalignments. Our result of Indonesia rupiah was overvalued is consistent with the findings of Furman and Stigliz (1998), Chinn *et. al.* (1998, 1999 and 2000a) and Saxena (2002) who also found that rupiah was overvalued on the eve of the currency crisis but contradict with the findings of Husted and MacDonald (1999) and Sazanami and Yoshimura (1999). Our finding of Malaysia ringgit was overvalued on the eve of the currency crisis is in consonant with the findings of Chinn *et. al.* (1998, 1999 and 2000a), Furman and Stigliz (1998), Husted and MacDonald (1999) and Sazanami and Yoshimura (1999). However, it is in conflict with Kwek and Yoong (2002) who found that ringgit was undervalued before the currency crisis. Our result of overvaluation Philippines peso before the currency crisis is supported by the findings of Furman and Stigliz (1998), Chinn *et. al.* (1998, 1999 and 2000a) and Sazanami and Yoshimura (1999). The result of Singapore dollar was overvalued on the eve of the currency crisis is in accord with the finding of Furman and Stigliz (1998) but is different from the findings of Chinn *et. al.* (1998, 1999 and 2000a). The finding of Thai baht was undervalued is in variance with the findings of Furman and Stigliz (1998), Sazanami and Yoshimura (1999) and Chinn *et. al.* (1998, 1999 and 2000a) who found Thai baht was overvalued on the eve of the currency crisis.

Table 7: Comparison Studies of ASEAN Exchange Rate Misalignments

	Model (Technique)	Indonesia	Malaysia	Philippines	Singapore	Thailand
F&S (1998)	PPP (long-run averaging)	Over	Over	Over	Over	Over
S&Y (1999)	PPP (long-run averaging)	Under	Over	Over		Over
H&M (1999)	Monetary model (panel cointegration)	Under	Over			
Chinn *et. al.*	1. (a) PPP model using PPI	Under	Over	Over	Under	Over
	1. (b) PPP model using CPI	Over	Over	Over	Over	Over
	. Augmented Balassa-Samuelson model (Deviation from mean)	Under	Under	Over	Over	Over
	. Augmented productivity trends in monetary model (VECM)	Over			Under	
Saxena (2002)	. Intertemporal optimization model (cointegration)	Over				
	. Unobserved component trend and cyclical model (Kalman Filter)	Over				
	. Blanchard and Quah macroeconomic model (structural VAR)	Over				
K&Y (2002)	Equilibrium real exchange rate model		Under			
This study	Monetary model (VECM)	Over	Over	Over	Over	Under

Notes: Exchange rates are domestic currency against USD. Over (Under) stands for overvaluation (undervaluation). F&S (1998) refers to Furman and Stigliz (1998); S&Y (1999) refers to Sazanami and Yoshimura (1999);H&M (1999) refers to Husted and MacDonald (1999); Chinn *et. al.* refers to Chinn (1998), Chinn and Dooley (1999) and Chinn (2000a); and K&Y (2002) refers to Kwek and Yoong (2002).

CONCLUSION

Building upon the theoretical framework of sticky price monetary model, this paper estimates the equilibrium exchange rates of five ASEAN countries. Using the residuals between real and equilibrium exchange rates, these ASEAN countries' exchange rate misalignments relative to the USD are derived. It is shown that before crisis Indonesia rupiah, Malaysia ringgit, Philippines peso and Singapore dollar were overvalued about 1 to 4 percent against USD while the Thai baht was 2 percent undervalued against USD. The misalignments are quite small. This suggests that the cause of the ASEAN crash cannot be attributed to traditional fundamentals. In particular, the undervalued Thai baht experienced crashed while the overvalued Philippines peso and Singapore dollar did not. Thus, the exchange rate overvaluation is not the key factor to the 1997 ASEAN currency crisis.

REFERENCES

Athukorala, P. 1998. Swimming against the Tide: Crisis Management in Malaysia. *ASEAN Economic Bulletin* 15: 281-289.

Bangko Sentral ng Pilipinas (various issues). *Annual Report,* Manila: Bangko Sentral ng Pilipinas.

Bank Indonesia (various issues). *Indonesia Monetary Economic Statistics*, Jakarta: BI. http://www.bi.go.id

Bank Negara Malaysia (various issues). *Quarterly Bulletin*, Kuala Lumpur: BNM. http://www.bnm.gov.my

Bilson, J. F. O. 1978. Rational Expectations and the Exchange Rate. In J. A. Frankel and H. G. Johnson (Eds.). *The Economics of Exchange Rates*. Mass: Addison-Wesley.

Chinn, M. D. 1998. Before the Fall: Were East Asian Currencies Overvalued? *NBER Working Paper No. 6491*. NBER.

Chinn, M. D. 2000a. Three Measures of East Asian Currency Overvaluation. *Contemporary Economic Policy* 18: 205-214.

Chinn, M. D. and Dooley, M. P. 1999. International Monetary Arrangements in the Asia-Pacific before and after. *Journal of Asian Economics* 10: 361-384.

Chinn. M. D. 2000b. Before the Fall: Were East Asian Currencies Overvalued? *Emerging Market Review* 1: 101-126.

Corsetti, G., Pesenti, P. and Roubini, N. 1998. What Caused the Asian Currency and Financial Crises? A Macroeconomic Overview. *NBER Working Paper No. 6833.* NBER.

Dickey, D. A and Fuller, W. A. 1979. Distribution of The Estimators for Autoregressive Time Series with a Unit Root. *Journal of American Statistical Association* 74: 427-431.

Dickey, D. A. and Fuller, W. A. 1981. Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica* 49: 1057-1072.

Dornbusch, R. 1976. Expectations and Exchange Rate Dynamics. *Journal of Political Economy* 84: 1161-1176.

Frankel, J. A. (1979). On the Mark: A Theory of Floating Exchange Rates Based on Real Interest Differential. *American Economic Review* 69: 610-622.

Frenkel, J. A. 1976. A Monetary Approach to the Exchange Rate: Doctrinal Aspects and Empirical Evidence. In R. MacDonald and M. P. Taylor (Eds.). *Exchange Rate Economics Volume I.* Cambridge: Cambridge University Press.

Furman, J. and Stigliz, J. 1998. Economic Crises: Evidence and Insights from East Asia. *Brookings Papers on Economic Activity* 2: 1-135.

Hill, H. 1998. An Overview of the Issues. *ASEAN Economic Bulletin* 15: 261-270.

Husted, S. MacDonald, R. 1999. The Asian Currency Crash: Were Badly Driven Fundamentals to Blame? *Journal of Asian Economics* 10: 537-550.

International Monetary Fund (various issues). *International Monetary Fund's International Financial Statistics Year Book.* Washington D.C.: IMF.

Johansen, S. 1988. Statistical Analysis of Cointegration Vectors. *Journal of Economic Dynamics and Control* 12: 231-254.

Johansen, S. 1991. Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. *Econometrica* 59: 1551-1580.

Johansen, S. and Juselius, K. 1990. Maximum Likelihood Estimation and Inference on Cointegration, with Applications to the Demand for Money. *Oxford Bulletin of Economics and Statistics* 52: 169-210.

Kwek, K. T. and Yoong, F. Y. 2002. Is Ringgit Malaysia Over-valued against the USD? Paper presented at 8th Convention of the East Asian Economic Association, 4-5 November 2002, Kuala Lumpur.

Ministry of Finance, Malaysia (various issues). *Economic Report*, Kuala Lumpur: Percetakan Nasional Malaysia Berhad. http://www.treasury.gov.my/index.html

Monetary Authority of Singapore (various issues). *Annual Report,* Singapore: MAS. http://www.mas.gov.sg

Nidhiprabha, B. 1998. Economic Crises and the Debt-Deflation Episode in Thailand. *ASEAN Economic Bulletin* 15: 309-318.

Radelet, S. and Sachs, J. 1998. The Onset of the East Asian Financial Crisis. *NBER Working Paper No. 6680.* NBER.

Sadli, M. 1998. The Indonesian Crisis. *ASEAN Economic Bulletin* 15: 272-280.

Saxena, S. C. 2002. Exchange Rate Dynamics in Indonesia: 1980-1998. *Journal of Asian Economics* 13: 545-563.

Sazanami, Y. and Yoshimura, S. 1999. Restructuring East Asian Exchange Rate Regimes. *Journal of Asian Economics* 10: 509-523.

Tawadros, G. B. 2001. The Predictive Power of the Monetary Model of Exchange Rate Determination. *Applied Financial Economics* 11: 279-286.

Trilemma Revisited with Special Reference to the Return on Bank Reserves

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ABSTRACT

Can trilemma be overcome? The answer is yes if we altered the way of conducting monetary policy. Monetary policy is impotent in an open economy with fixed exchange rate because it is conducted by changing the quantity of base money to affect the interest rate in order to alter the opportunity cost of holding money that will impact upon the money demand and other variables. But credibly fixed exchange rate regime will always make sure that the induced foreign financial capital flow will spontaneously reverse the monetary stance, restoring the interest rate and so the opportunity cost of holding money, nullifying the real effects. But once the bank reserves is remunerated, this paper finds that monetary policy can be effective if it is conducted through altering the return on base money to directly attain the desired opportunity cost of holding money. The free flow of foreign financial capital will actually help sustaining the attained opportunity cost spread by keeping the market interest rate at the initial level. Once the money demand has changed in ensuing, the effects will spillover from the money market to other real variables. As discussed, expansionary money policy attained through lowering the return on bank reserves will bolster the production; the resultant real exchange rate depreciation will tilt the output expansion inclining toward the tradable goods sector, contributing to the current account surplus and hence the accumulation of foreign reserves. And importantly, the revival of monetary autonomy is not at all at the expense of the automatic balance-of-payment adjustment mechanism critical to the credibility of the peg. Revisiting the classic internal-external balance tradeoffs from the perspective of this alternative monetary regime, we find that these long haunting internal-external balance contradictions can be easily resolved.

INTRODUCTION

Two recent papers by Obtsfeld et al (2004a, 2004b) empirically, with historical data covering more than 130 years, confirm the logic of trilemma. As in their words,

"…disorder often is linked to policies inconsistent with the constraint of the open-economy trilemma – the inability of policymakers simultaneously to pursue a fixed exchange rate, open capital markets, and autonomous monetary policy…as increasingly democratic polities faced pressures to engage in domestic macroeconomic management, however, either currency peg or freedom of capital movements had to yield."

We have no lack of literatures discussing how the inharmonic domestic macroeconomic stances and currency peg may often end in currency and financial crises, and even the collapse of entire international monetary system. For instances, Bordo (1996) argues that the occurrences of currency crises and the ultimate collapse of metallic monetary standard, Bretton Woods arrangement, European ERM and Latin American pegged regime were above all the consequences of inconsistency between government's policies and pegged exchange rates. Eichengreen (1998) documents the historical records of the evolution of international monetary system in corresponding to the development of international capital market and its effects on the choice of exchange rate regimes amid the changing domestic political environments that increasingly emphasize on internal stability.

This issue is particularly important to Asian economies given their loyal adherence to dollar peg, as compellingly argued by Mckinnon (2000), for preserving the exchange rate stability beneficial for international trade amid the bounded and costly hedging opportunities due to the "original sin". Providing that the openness of the economy has already imposed constraints on the effectiveness of monetary policy[1], some sorts of imperfections are then always needed to revive the monetary autonomy. Among others, currency peg with sterilization and capital control top the lists.

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[1] Any attempt to reduce the opportunity cost of holding money will induce capital outflow and a loss in foreign exchange reserves. Central bank's contracting assets should then be reflected in its liabilities: reduction in base money, and the opportunity cost of holding money increases subsequently.

The merits of sterilization, however, are in suspect. For example, high interest rates due to sterilization will only help magnifying the cumulative capital inflow. Calvo (1991) makes a case that the high debt service burden generated by sterilization (a swap of low-yielding foreign reserves for high-yielding treasury bill) casts a doubt on its feasibility in the context of fiscal costs. The happenings of Asian financial crises add to the list that the sustaining of high interest rates induces the domestic firms to engage in low-cost external loans. This trend, if not curbed, as the crises has shown, will build up the fragility and breed the seeds of destruction[2].

Even more controversial is the proposal for capital control. The imposition of short-lived capital and exchange controls in Malaysia has stimulated voluminous empirical studies, particularly on whether capital controls enable the retention of monetary independence to strengthen the crises imperviousness[3]. The results are, however, far from consensus.

In this vein, this paper aims to offer an alternative solution to the trilemma without attaching to any kinds of policy-generated imperfections. By employing a simple yet standard flexible price-wage intertemporal optimizing model for small open economy with fixed exchange rate regime, this paper proposes that once the bank reserves are remunerated in which the return on bank reserves operates as the policy instrument to change the monetary stance, "possible trinity" is in no way impossible[4]. Admittedly, this paper is not a description of the current monetary institutions but to offer as a description of how the alternative monetary institution could be more appropriate to serve our purpose.

Monetary policy is impotent in an open economy because it is conducted by changing the quantity of base money to affect the interest rate in order to alter the opportunity cost of holding money that will impact upon the money demand and other variables. But credibly fixed exchange rate regime will always make sure that the induced foreign financial capital flow will spontaneously reverse the monetary stance, restoring the interest rate and so the opportunity cost of holding money, nullifying the real effects.

The following model, however, suggests that monetary policy can be effective if it is conducted through altering the return on base money to attain the desired opportunity cost of holding money. The free flow of foreign financial capital will actually help sustaining the attained opportunity cost spread by keeping the market interest rate at the initial level. Once the money demand has changed in ensuing, the effects will spillover from the money market to other real variables. As will be clear later, expansionary money policy attained through lowering the return on bank reserves will bolster the production; the resultant real exchange rate depreciation will tilt the output expansion inclining toward the tradable goods sector, contributing to the current account surplus and hence the accumulation of foreign reserves.

Revisiting the classic internal-external balance tradeoffs from the perspective of this alternative monetary regime, we find that these long haunting internal-external balance contradictions can be easily resolved. For instance, for an economy troubled with inflation and balance-of-payment surplus, one may need increasing the return on bank reserves to tighten the monetary stance to curb internal inflation, while generating a real exchange rate appreciation that tilt the output contraction and greater consumptions toward tradable goods.

The remainders of the paper are organized as follows: section 2 builds the analytical framework, followed by section 3 that discusses the dynamic effects of expansionary monetary policy via lowering the return on bank reserves on the economy, particularly from the perspectives of output, labor supply, consumption, real balance, real exchange rate, bank's credit, and current account. Section 4 outlines an adapted optimizing IS-LM-BP model, based on the findings in section 3, to propose that the impossible trinity can be overcome once the return on bank reserves is taken as the policy instrument. Section 5 extends the ideas to resolving the internal-external balances contradiction. Section 6 provides final remarks.

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[2] Caballero and Krishnamurthy (2000) offer an interesting illustration on how sterilization may lead to "liquidity illusion" that unnecessarily feeds the boom, which acts to drain the system's liquidity, in the unsustainable unproductive non-tradable investment, which, once burst, brings about an external crisis.

[3] See Reinhart and Smith (1998), Cook and Devereux (2001), Kaplan and Rodrik (2001), and Jomo (2002). For the extensive survey of literatures on capital controls before Malaysia's controls, see Dooley (1995).

[4] See Freeman and Haslag (1995), Hall (1999), Goodfriend (2000, 2002) for discussions on the benefits and applications of paying interest on bank reserves.

ANALYTICAL FRAMEWORK

The small perfect-foresight production economy comprises five representative agents: household, firm, bank, treasury, and central bank. The infinitely lived household consumes both tradable and non-tradable goods. He or she offers the labor service to earn the living. In a perfect competition environment, the firm employs labor as the only input for production, while the bank resumes the traditional roles of intermediaries and liquidity creator. The treasury issues bonds not exceeding the value of prospective primary fiscal surplus, while the central bank determines the rate of return on bank reserves. The goods and asset markets are perfectly integrated with the rest of the world in which the law of one price is preserved and the domestic real interest rate is at the equality with world real rate.

The real exchange rate is the relative price of exportable goods. By normalizing the nominal exchange rate E to unity, the real exchange rate then equals the ratio of exportable and importable goods prices, $e = P^T / P^{T^*}$. Improved terms of trade, then, implies real exchange rate appreciation. Assuming the foreign inflation rate to be zero, perfectly open economy will ensure that domestic market interest rate will be at the level of world real interest rate plus expected (actual) rate of real currency appreciation, $i = r + p$. Lastly, all real terms (in small letter except for the bank reserves, R) are in non-tradable goods. Time subscripts are omitted for analytical convenience.

Firm

Firm employs labor (x) as the only input for production (y). Output, therefore, is a function of labor. Higher labor employment produces greater output at decreasing rate of return.

$$y = f(x), \qquad f_x > 0, f_{xx} < 0 \qquad [1]$$

where $y = y^N + \dfrac{y^T}{e}$.

The production comprises both non-tradable (y^N) and tradable goods (y^T). At the full potential level of output ($\bar{y}$), higher production on non-tradable goods implies lower production on tradable goods. Labor mobility between these two sectors is assumed to be perfect, impliying a zero adjustment cost of productions.

Firm requires bank's credit to finance its working capital: compensation to the labor services (w). Equation [2] illustrates the credit-in-advance constraint:

$$wx \leq l . \qquad [2]$$

The constraint will be continuously binding given the positive cost of financing.

Equation [3] shows how firm has to finance the labor cost and to service the working capital with the revenue earned:

$$\Omega^f = f(x) - wx - (i^l - p)l \qquad [3]$$

The firm's problem, therefore, is to maximize the present value of profit (Ω^f), which will be redistributed to the household, subject to the budget constraint and production structure[5]:

$$\underset{x}{Max} \quad \int_0^\infty e^{-rt} \Omega^f = \int_0^\infty e^{-rt} \{f(x) - wx(1 + r^l)\} \qquad [4]$$

$$s.t. \quad \log y^N + \frac{1}{e} \log y^T = \log \bar{y}$$

The first order conditions are:

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[5] For analytical convenience, the production structure is transformed into logarithmic form, implying a perfect substitutability between non-tradable and tradable goods.

$$f_x = w(1 + r^l) \tag{5a}$$

$$\frac{y^N}{y^T} = e \tag{5b}$$

Equation [5a] demonstrates the fact that, at the given real wage, higher cost of financing will reduce the demand for labors, and so, the outputs. Equation [5b] reveals the determinant of production structure: increase in the price level of non-tradable goods will tilt the production structure toward non-tradable outputs, and vice versa.

Bank

As financial intermediary, bank receives deposits[6] (m) to finance the non-liquid loan advances (l). To take care of its liquidity positions, bank will also acquire the interest-bearing liquid bank reserves (R). The bank's balance sheet constraint is hence given by:

$$l + R = m$$

The profits (Ω^b), which will be redistributed to household, are extracted after paying the interests to depositors (i^m) from the revenues earned through lending (i^l) and holding bank reserves (i^R).

$$\Omega^b = (i^l - p)l + (i^R - p)R - (i^m - p)m - \Psi(l, m) \tag{6}$$

Note that higher rate of inflation will shift the wealth from the creditors to the debtors. The last term of the equation refers to transaction costs incurred in maintaining a certain level of loans and deposits (such as ATM operations, savings book, loans monitoring and assessment, and so on). As in Edwards and Vegh (1997), this transaction cost will appear in the government budget constraint as revenue to reflect the fact that $\Psi(l, m)$ is a private cost for the bank but not a social cost.

The bank's problem is given by

$$\underset{d}{Max} \quad \int_0^\infty e^{-rt} \Omega^b = \int_0^\infty e^{-rt} \{(i^l - i^m)l + (i^R - i^m)R - \Psi(l, m)\} \tag{7}$$

The first order conditions are

$$i^l - i^m = \Psi_l \tag{8a}$$

$$i^R = i^m \tag{8b}$$

Equation [8a] states that costly banking system requires positive loan-deposit rate differentials. Equation [8b] argues that bank reserves as the most liquid assets in the bank's coffer earn an interest rate (return on base money) similar to the return on bank deposits. Higher return on bank reserves is therefore to be translated immediately into higher bank deposits interest rate.

Household

Household holds deposits, treasury bonds (b), and foreign assets (b^*) in portfolios. The aggregate real financial wealth is therefore given by:

$$a = m + b + \frac{b^*}{e}$$

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[6] Throughout the paper, money (m) is assumed to comprise only interest-bearing deposits (d), which implies equality between base money and bank reserves. The terms, therefore, are used interchangbly.

Household is endowed with one unit of time, devoted for work (x^s) and leisure (L). He earns the wage income, interests on the holding of financial assets, dividends ($\Omega = \Omega^f + \Omega^b$), and government's lump-sum transfer to finance the consumptions and financial assets accumulation[7]. Equation [9] shows this flow constraint:

$$\dot{m} + \dot{b} + \dot{b}^* = r(b + b^*) + wx^s + \Omega + \tau + (i^R - p)m - c^N - \frac{c^T}{e} \qquad [9]$$

The household has the following instantaneous utility function:

$$u\left(c^N, c^T, x^s,\right) + v(m), \qquad [10]$$

where $u_{c^N}, u_{c^T} > 0, u_{x^s} < 0, u_{c^N c^N}, u_{c^T c^T}, u_{x^s x^s} < 0, v_m > 0, v_{mm} < 0$

Forming the Lagrangian of household's optimization problem, we get

$$\underset{c^N, c^T, L, m}{Max} \qquad \int_0^\infty e^{-rt} \{u\left(c^N, c^T, x^s\right) + v(m)\}$$

$$s.t. \qquad \lambda \int_0^\infty e^{-rt} \left\{ r(b + b^*) + wx^s + \Omega + \tau + (i^R - p)m - c^N - \frac{c^T}{e} \right\} \qquad [11]$$

The first order conditions are

$$u_{c^N} = \lambda \qquad [12a]$$

$$u_{c^T} = \frac{\lambda}{e} \qquad [12b]$$

$$\frac{u_{c^N}}{u_{c^T}} = e \qquad [12c]$$

$$-u_{x^s} = \lambda w \qquad [12d]$$

$$\dot{\lambda} = \lambda(i - i^R) - v_m \qquad [12e]$$

Equation [12a] shows that the marginal utility of consumption of non-tradable goods equals the marginal utility of wealth. And the marginal utility of consumption of tradable goods, as from [12b], equals the marginal utility of wealth priced at the real exchange rate. Then as [12c] shows, the marginal rate of substitution between tradable and non-tradable goods will be an equivalent to the real exchange rate: an appreciated exchange rate tilts the consumption toward tradable goods.

Equation [12e] is the law of motion, which shows that the marginal utility of wealth rises or falls over time depending on whether the return on bank reserves that directly determines the deposits rate, as in equation [8b], falls below or exceeds the interest rate on treasury bond[8]. In the former case, the interest-rate differential between treasury bonds and bank reserves – the opportunity cost spread of holding money – widens, contributing to increases in the marginal utility of wealth over time.

This relationship can be generalized to the following function:

$$\lambda = \lambda(I), \qquad \lambda_I > 0 \qquad [12f]$$

where $I = I\left(\overset{+}{i}, \overset{-}{i}^R\right)$.

To ensure the ultimate attainment of a steady state, it then follows from [12e] that at $\dot{\lambda} = 0$, $i - i^R$ equals to the marginal rate of substitution between consumption and money, v_m / u_{c^N}.

Equation [12d] implicitly defines the supply function of labor. At the given level of real wage, higher marginal utility of wealth brings about a preference toward providing labor service. Coupled with equation [12f], we find that labor supply is endogenously determined by the return on bank reserves:

$$x^s = x\left(\lambda\left(I\left(i, i^R\right)\right)\right), \qquad x_\lambda \lambda_I I_{i^R} < 0.$$ [12g]

Higher (lower) return on bank reserves that narrows (widens) the interest-rate differential improves (worsen) the wealth condition, contributing to lesser (greater) supply of labor.

Government

Central bank carries the function of contracting and expanding the liquidity in the system. As in the common practice, to credibly fix the exchange rate parity requires the liquidity supply to be the mirror image of the balance of payment adjustment. For instance, if the central bank contracts the base money through open market sale, and hence increasing the treasury bond interest rate above the world level, the foreign financial capital is to be induced to flow in. The resultant accumulation of foreign reserve stocks will bring about an expansionary monetary policy, which, in turn, will depress the interest rate back to the initial level.

This monetary regime, however, relies on adjusting the return on bank reserves to directly impact upon the demand side instead of changing the supply side as mentioned above. For instance, if the central bank attempts to have contractionary monetary stance, the bank will narrow the interest-rate differential between treasury bonds and reserves. To narrow the spread, the bank will increase the return on bank reserves, inducing the portfolio reshuffling from lower-yielding treasury bonds to higher-yielding bank reserves. The price of treasury bond will drop, driving up the interest rate as well. This, in turn, will trigger the footloose foreign financial capital inflow to exploit the arbitrage opportunities, pushing the interest rate back to the lower level. As a consequence, the narrowed interest-rate differential is able to be maintained, supporting the contractionary monetary stance!

Two very important outcomes should be noted: first, even if the exchange rate is fixed under perfect capital movement, unlike the conventional wisdom, the desired monetary stance is capable to be sustained, signaling the revival of monetary autonomy. Second, the revival of the monetary sovereignty, again, unlike the conventional wisdom, is not at the expense of the credibility of the fixed exchange rate regime: the balance-of-payment adjustment mechanism is undisrupted!

To highlight the role of return on bank reserves, central bank will not acquire any of the treasury bonds so that open market operation is not in need at all. The stock of bank reserves is sufficiently backed by the stock of foreign reserves $f/e = m$, or otherwise, the real exchange rate will depreciate. Central bank receives interests from the holding of foreign reserves stock to finance the interests paid on bank reserves. Equation [13] demonstrates this flow constraint.

$$\dot{f} - \dot{R} = rf - r^R R$$ [13]

The function of treasury department is rather simple: raise revenue from providing the services to the banking system, make the lump-sum transfer to the household, and pay the interests to the bondholder. Inadequacy will be financed by issuing bonds.

$$\dot{b} = \tau + rb - \Psi(l, d)$$ [14]

Impose the non-Ponzi condition, the intertemporal budget constraint of the treasury is given by:

$$\frac{B_0}{P^N} = \frac{-\tau + \Psi(l, d)}{r}.$$ [15]

where $b_0 = B_0 / P^N$.

Equation [15] reveals the fact that the ability of treasury to issue debt depends on the prospective primary fiscal surplus. Greater primary fiscal surplus allows treasury to issue more bonds at the very beginning. Have the value of nominal bond issuance been inadequately backed by the prospective primary fiscal surplus, the domestic price level will increase. This budget constraint is, therefore, assumed to hold on and off equilibrium so as to highlight the effects of return on bank reserves upon the real exchange rates.

The government's consolidated flow constraint is, hence, given by the combination of [13] and [14]:

$$r(f - b) + \Psi - \tau = r^R R + \dot{f} - \dot{R} - \dot{b}$$ [16]

Imposing the non-Ponzi condition, the government's intertemporal budget constraint is:

$$\frac{r^R R}{r} = f_0 - b_0 + \frac{\Psi - \tau}{r}$$ [17]

Equation [17] shows that the discounted burden of servicing the interest-bearing bank reserves is constrained by the initial stock of net foreign reserves and prospective primary fiscal surplus.

By combining equation [3], [6], [9], and [16], we obtain the economy's resource constraint:

$$\dot{f} = rk + f(x) - c^N - \frac{c^T}{e} - b^*,$$ [18]

where $k = f + b^*$.

Changes in the international payments will be nil if the flow of current account balances the capital account.

Market Clearing Conditions

Labor market

Labor market is in equilibrium when the demand for equals to the supply of labor service.

$$x = x^s$$

Then, from equation [5], [12d] and [12f], given the sticky real wage, the equilibrium condition can be rewritten as follows:

$$1 + i^l = -\lambda\left(I\left(i^R\right)\right)$$ [19]

If there is insufficient demand for labor, equilibrium can be obtained by lowering the return on bank reserves.

Non-tradable goods market

The non-tradable goods production is endogenously determined by its demand and the real exchange rate (see 5[b]).

$$c^N = y^N$$ [20]

If it happens that $c^N > y^N$, one needs real exchange rate appreciation to direct the resources from tradable to non-tradable output production, and at the same time, to generate a shift in preference toward tradable goods.

Credit market

Credit market is in equilibrium when

$$l^s = l^d .$$

The bank's first order condition [8a] in log linear approximation characterizes the supply of credits. The demand function of credits can be obtained by combining the firm's first order condition [5a] and the binding credit-in-advance constraint. Therefore, the credit market equilibrium is given by

$$i^l - i^R = \frac{x f_x}{1 + i^l} . \tag{21}$$

Expansionary monetary stance through lowering return on bank reserves will bring about a credit boom: greater credit supply resulted from bank's portfolio reshuffling with greater credit demand fueled by labor market expansion.

Money market

From the law of motion [12e], at steady state,

$$i - i^R = \frac{v_m}{u_{c^N}} . \tag{22}$$

This equation implicitly defines a money demand function:

$$m = L\left(I\left(i, i^R\right), c^N\right), \qquad L_I I_{i^R} > 0, L_{c^N} > 0 \tag{23}$$

Higher return on bank reserves shrinks the interest-rate differential between treasury bonds and bank reserves, encouraging greater demand for money. Besides, holding of money serves the transaction purpose to which higher consumption of non-tradable goods supports greater demand for money.

The market is equilibrated when

$$M^s = PL\left(I\left(i, i^R\right), c^N\right) \tag{24}$$

Rearrange equation [24], with the facts that $e = P^T / P^{T^*}$, $P = (P^N)^\alpha (P^{T^*})^{1-\alpha}$, and $M^s = R$, will allow us to see how the real exchange rate is determined in money market:

$$\frac{1}{e} = \left[\frac{M^s}{L(.,.)}\right]^{\frac{1}{1-\alpha}} \left[\frac{1}{P^N}\right]^{\frac{\alpha}{1-\alpha}} \left[\frac{1}{P^T}\right] . \tag{24'}$$

There are three sources affecting the real exchange rate: monetary stance, domestic and exportable price level. A demand-driven monetary expansion due to lower return on bank reserves would depreciate the real exchange rate; higher non-tradable and world exported prices, nonetheless, cause real appreciation.

Dynamic Conditions

Differentiate equation [12a] against time, and combine it with the law of motion [12e], we will obtain

$$\dot{c}^N = -\frac{u_{c^N}}{u_{c^N c^N}} \left(i^R - i + \frac{v_m}{u_{c^N}}\right) . \tag{25}$$

Equation [25] shows that when the return on bank reserves stays above the market interest rate, the consumption of non-tradable goods will be increasing over time. Equally, a decline in the return on bank reserves will cause the consumption of non-tradable goods to fall over time.

Equation [26] is to capture the determinants of the change in the inflation rate:

$$\dot{p} = \phi(\mu - p) + \varphi(c^N - \bar{y}^N) \,. \tag{26}$$

It says that the inflation rate will increase whenever the rate of inflation is below the rate of nominal money growth (μ), or the absorption on domestic goods exceeds the potential non-tradable outputs ($\bar{y}^N$).

Insert [20] into [18], with the facts that $\dot{f} = \dot{m}$, $y = y^N + \dfrac{y^T}{e}$, and asset substitution between domestic and foreign deposits is a function of return on bank reserves, we obtain the real balances accumulation as follows:

$$\dot{m} = rk + \frac{1}{e}(y^T - c^T) - b^*\left(i^R\right) \tag{27}$$

where $b^*_{i^R} < 0$.

Equation [25], [26], and [27] constitute the dynamics of the system. The system's steady state is given by

$$i - i^R = \frac{v_{\tilde{m}}}{u_{c^N}} \tag{28a}$$

$$\mu = \tilde{p} \tag{28b}$$

$$\tilde{c}^N = \bar{y}^N \tag{28c}$$

$$rk + f\left(x\left(\lambda(I)\right)\right) - \bar{y}^N = \frac{\tilde{c}^T}{e} \tag{28d}$$

Linearizing the system around the steady state, we obtain

$$\begin{bmatrix} \dot{c}^N \\ \dot{p} \\ \dot{m} \end{bmatrix} = \begin{bmatrix} i - i^R & 0 & -\dfrac{v_{mm}}{u_{c^N c^N}} \\ \varphi & -\phi & 0 \\ -1 & 0 & 0 \end{bmatrix} \begin{bmatrix} c^N - \tilde{c}^N \\ p - \tilde{p} \\ m - \tilde{m} \end{bmatrix} \tag{29}$$

The determinant, $\Delta = \dfrac{\phi v_{mm}}{u_{c^N c^N}} > 0$, implies that the system must be either a stable or unstable node adjustment.

Given the negative trace ($= i - i^R - \phi$), it must be the case that the system has two negative and one positive roots. Since m and c^N are predetermined, the system exhibits a unique solution: for a given value of i_0^R and μ, and thus, m_0 and c_0^N, both will converge to the equilibrium along the saddle path.

Let δ_1 be the negative root. To obtain the eigenvector associated with this root we should solve

$$
\begin{bmatrix}
r - r^R - \delta_1 & 0 & -\dfrac{v_{mm}}{u_{c^N c^N}} \\[2ex]
\varphi & -\phi - \delta_1 & 0 \\[2ex]
-1 & 0 & -\delta_1 \\[2ex]
\end{bmatrix}
\begin{bmatrix}
h_{i1} \\ h_{i2} \\ h_{i3}
\end{bmatrix}
=
\begin{bmatrix}
0 \\ 0 \\ 0
\end{bmatrix}
\tag{30}
$$

where h_{i1}, h_{i2} and h_{i3}, $i=1,2$ are the elements of the eigenvector associated with the negative eigenvalues. And hence, the solution to the linear approximation of the dynamic system takes the form:

$$
c^N - \tilde{c}^N = A_1 h_{11} e^{\delta_1 t} + A_2 h_{21} e^{\delta_2 t} + A_3 h_{31} e^{\delta_3 t}
\tag{31a}
$$

$$
p - \tilde{p} = A_1 h_{12} e^{\delta_1 t} + A_2 h_{22} e^{\delta_2 t} + A_3 h_{32} e^{\delta_3 t}
\tag{31b}
$$

$$
m - \tilde{m} = A_1 h_{13} e^{\delta_1 t} + A_2 h_{23} e^{\delta_2 t} + A_3 h_{33} e^{\delta_3 t}
\tag{31c}
$$

where A_1, A_2, and A_3 are arbitrary constants.

Setting to zero the constants corresponding, respectively, to the second stable A_2 and unstable roots A_3, the solutions are reduced to

$$
c^N - \tilde{c}^N = A_1 h_{11} e^{\delta_1 t}
\tag{32a}
$$

$$
p - \tilde{p} = A_1 h_{12} e^{\delta_1 t}
\tag{32b}
$$

$$
m - \tilde{m} = A_1 h_{13} e^{\delta_1 t}
\tag{32c}
$$

Eliminating $A_1 e^{\delta_1 t}$ from these equations and it follows that

$$
\frac{c^N - \tilde{c}^N}{p - \tilde{p}} = \frac{h_{11}}{h_{12}} = \frac{\phi + \delta_1}{\varphi} \approx 0
\tag{33a}
$$

$$
\frac{c^N - \tilde{c}^N}{m - \tilde{m}} = \frac{h_{11}}{h_{13}} = \frac{-\delta_1}{1} > 0
\tag{33b}
$$

The convergent paths are similar when setting constant to the first stable root A_1 to zero.

Equation [33] implies that whenever these is a shock to the system, consumption of non-tradable goods and real balance will converge to their steady-state values in the same direction, while the inflation rate will be left unchanged. This dynamic path is drawn in Figure 1.

MONETARY EXPANSION VIA LOWERING THE RETURN ON BANK RESERVES

Suppose that at the initial steady-state, the return on bank reserves is i_H^R. At t = 0, the central bank announces a permanent decrease in the return on bank reserves from i_H^R to i_L^R. Lower return will have both $\dot{c}^N = 0$ and $\dot{m} = 0$ shifting downward with the former algebraically to greater extent, as drawn in Figure 2. m contracts from the initial steady state to the new saddle path before converging toward the new steady state along with the c^N. At new steady state, c^N is lower amid a higher m[9].

---

[9] See appendix for the formal derivation of comparative static effects of i^R on c^N and m in which $\partial c^N / \partial i^R > 0$ and $\partial m / \partial i^R < 0$.

The intuition behind this observation is as follows. Lower return prompts a portfolio adjustment from (i) lower-yielding bank reserves to higher-yielding credits (see [21]) and (ii) lower-yielding bank deposits to higher-yielding treasury bonds and foreign deposits. The resultant higher price of treasury bonds will set off foreign financial capital efflux, propping up the market interest rate, which turns out to be upholding the desired larger interest-rate differential between treasury bonds and bank reserves that will keep a relative excess supply of money. Combined with the induced asset substitution from domestic deposits to foreign deposits, the spontaneous capital outflow will cause the real balance to contract.

Lower return on bank reserves worsens the wealth condition, and hence, as in [12a], triggers a decline in the consumptions of non-tradable goods. In a flexible price environment, with the constant stock of bank reserves, lower money demand will depreciate the real exchange rate, which, in turn, discourages the consumption of tradable goods. According to [12c], the fall in the consumption of tradable goods must be greater than those of non-tradable goods.

As in [12g], lower return on bank reserves stimulates the supply of labor, fully absorbed by firm. The credit market is in boom because banks are more willing to lend (see [21]), corresponding to firms' need in more credits to finance the absorption of additional labor supply. After all, the total output will expand. Note that the depreciated real exchange rate, not to speak the lower demand for non-tradables, must be then directing the production toward tradable outputs, as [5b] and [20] have shown. Given the contraction in the consumption of tradables, the current account will turn out to be in surplus along the adjustment path.

Current account surplus contributes to the accumulations of foreign reserves over time. Along the saddle path, the real exchange rate will stop falling but appreciate. The mounting stock of foreign reserves, then, is released via the real appreciation to the greater demand for real balances. Moreover, the real appreciation endorses increasing consumptions of tradables, and, of course, of non-tradables to a lesser extent. After all, at new steady state, the liquidity of the system is augmented, with an economic boom inclining toward the production of tradable goods. Table I summarizes the effects of lower return on bank reserves.

OVERCOMING IMPOSSIBLE TRINITY

Impossible trinity indicates the tradeoff between monetary autonomy and perfectly open economy with fixed exchange rate regime. It has been a standard textbook case that when the central bank raises the interest rate to the level above the world interest rate, massive capital flows will be attracted to exploit this arbitrage opportunity. The resultant non-sterilized intervention of central bank must necessarily cause the money supply to increase to the initial level of money stock. The domestic interest rate is restored equalizing the world rate, and the effect on output vanishes.

Put it differently, the impotency of monetary policy stems from the central bank's inability to alter and uphold the desired opportunity cost spread of holding money. Evidently from the above discussion, this alternative monetary regime that influences the monetary stance not via the intervention in money supply to indirectly alter the opportunity cost spread but by adjusting the return on bank reserves to directly impact upon the opportunity cost spread and so the money demand seems to be capable to overcome the long-haunting tradeoff.

To make a parallel comparison between the conventional and newly-devised monetary regimes, the IS-LM-BP model is employed. For analytical convenience, we transform the marginal substitution of utility between money and non-tradables consumption in [22] into logarithmic form to get the following:

$$c^N = m(i - i^R) \tag{34}$$

By inserting [20], [23], [34], and the relationship of $y^N = y - \dfrac{y^T}{e}$ into [26], and setting $\dot{p} = 0$ and $\mu = p$, we will obtain a modified version of IS equation:

$$\text{IS:} \qquad ef\!\left(\overset{-}{i^R}\right) - y^T = L\!\left(\overset{+}{i^R}, \overset{+}{y}\right)(i - i^R) \tag{35}$$

In i^R-y space diagram, since lower return on bank reserves decreases the money demand while expanding the outputs, which, in turn, will increase the demand for money, the IS curve will slope downward from left to right. Points to the left refer to decreasing rate of inflation and underemployment conditions, while points to the right refer to increasing rate of inflation and overemployment.

Equation [24] is taken as the LM equation:

$$\text{LM:} \qquad eR = L\left(\overset{+}{i^R}, \overset{+}{y} \right) \qquad\qquad [36]$$

Since both higher return and output increase the demand for money, the LM will slope downward from left to right for attaining the equilibrium. Any points above the curve refer to the contractionary monetary stance, while points below the curve denote expansionary monetary stance. This is in contrast to the standard upward sloping LM curve. Most importantly, since return on bank reserves is the price of money, any adjustments due to the changes of its own price – return on bank reserves – must be *along* the curve. In other words, an expansionary monetary policy will not see a *shift in the curve*, as the standard model predicts, but *on the curve*!

Setting $\dot{m} = 0$, [18] represents the BP equation:

$$\text{BP:} \qquad rk + f\left(x\left(I\left(i^R \right) \right) \right) - c^N - \frac{c^T}{e} = b^*\left(\overset{-}{i^R} \right) \qquad\qquad [37]$$

Any points below the horizontal BP curves imply balance-of-payment deficits, and points above the curve denote the balance-of-payment surplus. When return on bank reserves is lowered, the BP curve will move downward.

Figure 3 demonstrates this adapted version of IS-LM-BP model. Suppose the initial equilibrium is at point E, shown in Figure 4. Then we have a central bank attempting to carry out an expansionary monetary policy. Instead of increasing the money supply, the bank contracts the money demand by lowering the return on bank reserves. Lower return spontaneously prompts capital outflow, leading to a fall in the stock of foreign reserves. BP curve, therefore, shifts downward from BP_0 to BP_1. About the same time, lower return on bank reserves induces greater supply of, and so the demand for labor, contributing to the output expansions. The IS curve then shifts outward from IS_0 to IS_1. The LM curve, however, will remain constant because the monetary stances are adjusted not through the quantity of money supply but via the variation of the money's own price: return on bank reserves. The burden of adjustment falls upon the demand side. A*long* the curve, the depressed money demand due to lower return on bank reserves is rejuvenated by the output expansions. At point F, all market equilibriums are re-attained. This means that point F is by no means a transitional condition, but a stable ultimate equilibrium. In this vein, we may propose that

> **Proposition 1**: *In an open economy with perfect capital mobility and fixed exchange rate regime, the monetary sovereignty can be revived once the return on bank reserves becomes the tool to influence the opportunity cost spread of holding money and so the money demand, which ultimately helps achieving the desired monetary stances.*

ONE INSTRUMENT, TWO TARGETS

The major policy implication of trilemma, in which capital movement is unrestricted under fixed exchange rates, is of insufficient policy canons to aim for inharmonic internal and external balance. Among others being the inflation surplus and unemployment deficit that require different policy stances.

For instances, an inflationary economy running contractionary fiscal policy – the only left policy tool – may find itself falling deeper into the external surplus. Inversely, expansionary fiscal policy sought to battle against the domestic unemployment may further aggravate external deficits. Worst still, Riascos and Vegh (2003) find that, unless the financial markets are well developed, fiscal policy is determined to be procyclical in developing countries, therefore announcing the death of possibilities to reconcile the internal-external balance contradictions.

If the return on bank reserves, as in Proposition 1, is capable to overcome the trilemma, would it be able then to accomplish this "mission impossible"? Undoubtedly, discussions on the system's dynamic adjustments in section 3 offer the following propositions:

> **Proposition 2**: *Under perfect capital mobility and fixed exchange rate regime, unemployment and balance of payment deficits can be simultaneously resolved by lowering return on bank reserves.*

> **Proof**: *The proof proceeds by contradiction*

Suppose that $1 + i^l > -\lambda\left(I\left(i^R\right)\right)$. If one increases i^R, as in [8a], lower $i^l - i^R$ depresses l. Besides, as in [12g], higher i^R discourages x, which, in turn, according to [1], brings about a fall in y. With [12a], [12f] and [20], we know that c^N and y^N increase. To uphold [24], e will increase, generating resource flow from y^T to y^N. The combined effects of [1], [5b], and [12b], as [18] shows, will deteriorate net foreign assets position, which is in contradiction to the proposition. QED

Proposition 3: *Increasing the return on bank reserves will concurrently overcome the dilemmas of overemployment and balance of payment surplus.*

Proof: *The proof proceeds by contradiction*
Suppose $1 + i^l < -\lambda\left(I\left(i^R\right)\right)$. If one decreases i^R, then, according to [8a], lower i^R stimulates l, while, as in [12g], encouraging greater x. With [12a] and [12f] we know that c^N will fall. And based on [20], so will be y^N. Since e will decline to equilibrate [24], the resources move from y^N to y^T. The combined effects of [1], [5b], [12b], as [18] shows, will improve net foreign assets position, which is in contradiction to the proposition. QED

The intuition is simple: if expansionary monetary policy is attained not via expanding the money supply, but by contracting the money demand, we will observe a resultant domestic de-absorption, particularly on tradable goods. Combined with the tradables-oriented output expansion due to the lower return on bank reserves that stimulates greater labor supply and demand financed by credit expansion, and that depreciates the real exchange rates in equilibrating the money market, this demand-driven expansionary monetary stance will lead to current account, and so balance-of-payment surplus.

Conversely, increasing the return on bank reserves that decreases the opportunity cost spread of holding leads to excess demand for money over the constant stock of money supply, therefore tightening the monetary stance. Higher return on bank reserves that improves the wealth condition and shrivels the credit advances will cut the labor supply. Since improving wealth condition fuels greater consumption of non-tradable goods, the subsequent real exchange rate appreciation must be motivating the consumptions of tradable goods to a greater extent. Jointed with the tradables-oriented output contraction, the demand-driven contractionary monetary stance will bring about current account and balance of payment deficits.

Note that, though the revival of monetary autonomy is not at the expense of the automatic balance-of-payment adjustment mechanism, whether an expansionary monetary policy results in balance-of-payment deficits or surplus is conditional on the driving factor: supply-driven expansionary monetary policy causes balance-of-payment deficits, as in conventional model, whereas demand-driven expansionary policy stance leads to balance-of-payment surplus, as in this return-on-bank-reserve-cum-fixed-exchange-rate model.

FINAL REMARKS

It is worth to reemphasize that the desired opportunity cost spread of holding money is attainable only with the helps of borderless capital movement, or otherwise, this policy-generated interest-rate differential between treasury bonds and bank reserves and its subsequent effects will disappear due to the portfolio reshuffling by domestic agents.

The model, however, is by no means comprehensive, not to say conclusive. Extensive researches are required to assure the feasibility and effectiveness of the reserve interest rate as a policy tool. Among others, fiscal implication, and capital accumulation and growth seem warranted. In this paper the fiscal policy is implicitly assumed to accommodate the monetary policy. What will be the consequence if it is the monetary policy to accommodate the fiscal policy? What are the advantages of reserve interest rate regime vis-à-vis the orthodox approaches, i.e. inflation-targeting, interest rate targeting, Friedman's k percent money targeting, and real exchange rate targeting? Should reserve interest rate regime be a targeting or instrument rule?

Most stimulating, if there is no tradeoff among open capital markets, fixed exchange rates, and autonomous once the monetary operation is revised by adjusting the return on bank reserves to control the liquidity stance and price level, would it mean that some forms of monetary union different to the EU is possible? That comes into the imagination will be a currency area without the core country to sail the one-size-fit-all monetary policy,

a currency union that simultaneously allows the automatic balance-of-payment adjustment mechanism to take place and the monetary stance sized for domestic economic conditions.

REFERENCES

Agenor, Pierre-Richard, Aizenman, Joshua, and Hoffmaister, Alexander W. (2004) "The Credit Crunch in East Asia: What Can Bank Excess Liquid Assets Tell Us?" *Journal of International Money and Finance* 23, pp. 27-49.

Bordo, M.D. and Schwartz, A.J. (1996) "Why Clashes between Internal and External Stability Goals End in Currency Crises, 1797 – 1994?" *Open Economies Review*, Vol. 7 pp. 437-468.

Caballero, Ricardo J., and Krishnamurthy, Arvind (2000), *International Liquidity Management: Sterilization Policy in Illiquid Financial Markets*, NBER Working Paper No. 7740.

Calvo, Guillermo A. (1991), "The Perils of Sterilization" *IMF Staff Papers*, Vol. 38, No. 4 (Dec), pp. 921-926.

Cook, David, and Devereux, Michael B. (2001), *Capital Controls in Malaysia: Effectiveness and Side Effects*, mimeograph.

Dooley, Michael (1995), *A Survey of Academic Literature on Controls over International Capital Transactions*, NBER Working Paper No. 5352.

Eichengreen, B. (1999), *Globalizing Capital: a History of International Monetary System*, Princeton: Princeton University Press.

Freeman, Scott, and Haslag, Joseph H. (1995), "Should Bank Reserves Earn Interest?" Federal Reserve Bank of Dallas *Economic Review* (Forth Quarter).

Goodfriend, Marvin (2000), "Overcoming the Zero Bound on Interest Rate Policy", *Journal of Money, Credit and banking* 4, No. 32, part 2 (Nov), pp. 1007-1035.

_____ (2002), "Interest on Reserves and Monetary Policy", Federal Reserve Bank of New York *Economic Policy Review* (May), pp. 77-84.

Hall, Robert E. (1999), *Controlling the Price Level*, NBER Working Paper No. 6914.

Kaplan, Ethan, and Rodrik, Dani (2001), *Did Malaysia Capital Control Work*, NBER Working Paper No. 8142.

Jomo, K.S. (2002), *Malaysian Eclipse*, London: Zed.

Mckinnon, Ronald I. (2000), *After the Crisis, the East Asian Dollar Standard Resurrected: an Interpretation of High-Frequency Exchange Rate Pegging*, mimeograph, Stanford University.

Obstfeld, M., Shambaugh J.C. and Taylor, A.M. (2004a) *Monetary Sovereignty, Exchange Rates and Capital Controls: the Trilemma in the Interwar Period*, NBER Working Paper No. 10393.

_____ (2004b) *The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility*, NBER Working Paper No. 10396.

Reinhart Carmen, and Smith R.T. (1998), "Too Much of a Good Thing: the Macroeconomic Effects of Taxing Capital Inflows" in Glick R. (ed.), *Managing Capital Flows and Exchange Rates: Perspective from the Pacific Basin*, Cambridge: Cambridge University Press.

Riasco, Alvaro and Vegh, Carlos A. (2004), "Procyclical Government Spending in Developing Countries: The Role of Capital Market Imperfection", *IMF Staff Papers*, Vol. 51, Special Issue 2004.

APPENDIX

A.1.   *Comparative Static Effect*

Total differentiating the dynamic equations [24] – [26] against the reserve interest rate in matrix form, we obtain the followings:

$$
\begin{bmatrix}
i - i^R & 0 & -\dfrac{v_{mm}}{u_{c^N c^N}} \\[2mm]
\varphi & -\phi & 0 \\[2mm]
-1 & 0 & 0
\end{bmatrix}
\begin{bmatrix}
\dfrac{\partial c^N}{\partial i^R} \\[2mm]
\dfrac{\partial p}{\partial i^R} \\[2mm]
\dfrac{\partial m}{\partial i^R}
\end{bmatrix}
=
\begin{bmatrix}
\dfrac{u_{c^N}}{u_{c^N c^N}} \\[2mm]
0 \\[2mm]
- f_x\, x_\lambda \lambda_I I_{i^R}
\end{bmatrix}
\qquad \text{[A1]}
$$

By applying inverse matrix operation, rearrange this equation to the following:

$$
\begin{bmatrix} \dfrac{\partial c^N}{\partial i^R} \\[2ex] \dfrac{\partial p}{\partial i^R} \\[2ex] \dfrac{\partial m}{\partial i^R} \end{bmatrix} = \dfrac{u_{c^N c^N}}{\phi v_{mm}} \begin{bmatrix} 0 & 0 & \dfrac{\phi v_{mm}}{u_{c^N c^N}} \\[2ex] 0 & \dfrac{\phi v_{mm}}{u_{c^N c^N}} & 0 \\[2ex] \dfrac{\phi v_{mm}}{u_{c^N c^N}} & 0 & 0 \end{bmatrix} \begin{bmatrix} \dfrac{u_{c^N}}{u_{c^N c^N}} \\[2ex] 0 \\[2ex] -f_x\, x_\lambda \lambda_I\, I_{i^R} \end{bmatrix}
$$

[A2]

Apparently, we will obtain the following partial differentials of choice variables to the return on bank reserves:

$$
\frac{\partial c^N}{\partial i^R} = -f_x\, x_\lambda \lambda_{iI}\, I_{i^R} > 0\,, \quad \frac{\partial m}{\partial i^R} = \frac{u_{c^N}}{u_{c^N c^N}} < 0
$$

$$
\frac{\partial p}{\partial i^R} = 0\,,
$$

[A3]

Figure 1: The Dynamic Stability Adjustment In (C, M) Space
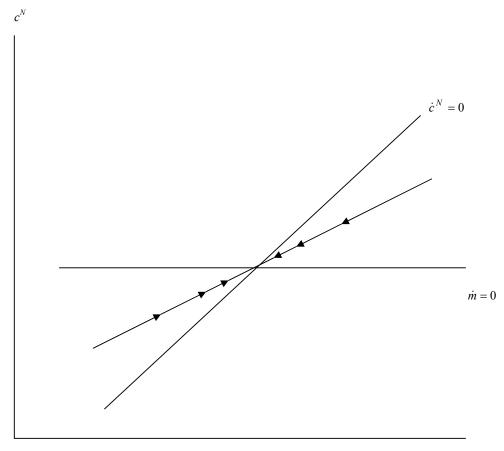
Figure 2: Permanent Reduction in Return on Bank Reserves
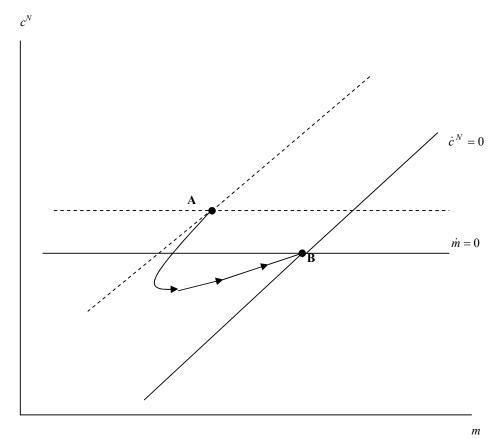
Table 1: Summary of the Long Run Steady-State Effect of Lower Return on Bank Reserves

	Conventional Monetary operation	Reserve-interest-rate regime
Opportunity cost spread	0	+
Production of tradables	0	+
Production of non-tradables	0	-
Consumption of tradables	0	-
Consumption of non-tradables	0	-
Real balance	+	+
Price Level / Real Exchange Rate	+	-
Inflation rate	0	0
Nominal interest rate	0	0
Current account balance	0	+
Credit market	0	+

Figure 3: The Modified Version of IS-LM-BP
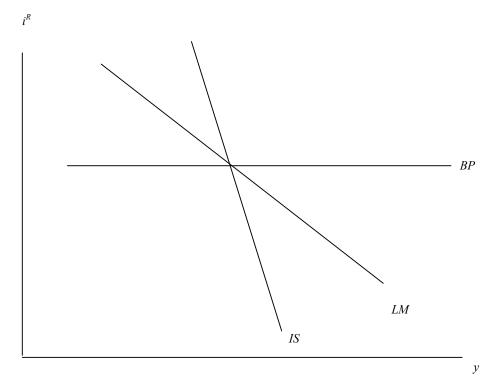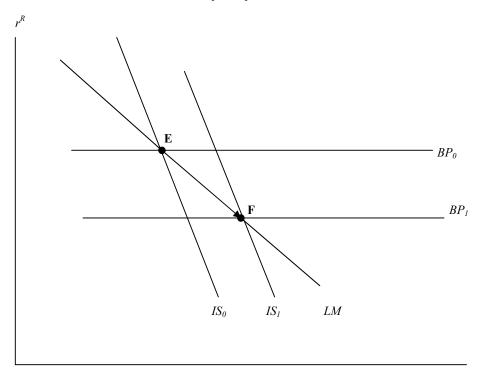
Figure 4: When Reserve Interest Rate Falls, Output Expands

Relationships Between Office Ergonomics, Employees' Satisfaction and Performance

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ABSTRACT

In this competitive age, most organisations have taken great efforts to improve the employee's potential but some of them overlooked the importance of office ergonomics. Office ergonomics has been recognised by many authors as the vital factor in influencing job satisfaction, office environment and employee's performance. In the government offices, some elements of ergonomics have been identified to have significant influences on these three aspects. Using the data collected from selected government offices in Terengganu, the findings indicate that office noise and office procedures posed significant influences on the employee's performance. Environment satisfaction is closely determined by office arrangement and office floor. Besides, lighting, meeting room, office desk and temperature were found to be the dominant factors of employee's job satisfaction. The study also found that there are different employees' perceptions towards elements of office ergonomics in various government offices especially with regards to lighting, meeting room and office noise. As a conclusion, the particular element of ergonomics should be focused by the employers in order to achieve the desired level of environment satisfaction and job satisfaction and subsequently will boost the performance of their employees.

INTRODUCTION

Computers significantly changed the work process. Working in automated workstation, people can perform more tasks without leaving their seat, or even taking their hands off their keyboards. Working at a computer for a relatively long period of time, can cause physical problems like headaches, visual problems, and pain in the wrists, arms, back, neck and shoulders. Others elements in the office such as carpeting, lighting, ventilation system, and office noise have established to add potential risks to the employees. Uncarpeted office floor increases employees' possibility of injury while walking across the office room. Unsatisfactory lighting system causes the employees to suffer from eye irritation, glare and headaches. Poor ventilation system, on the other hand, may cause sick building syndromes such as headaches, dizziness, abnormal tiredness, breathing difficulties, sore throats, cough and skin rashes. Additionally, employees who are exposed to office noise for an extended period of time may experience temporary or permanent hearing loss, tension and blood pressure.

Therefore, the study of ergonomics conditions in the office in is a must in order to create a healthy working environment and to prevent sick building syndromes and repetitive motion injuries. Healthy working environment may boost employees' physical abilities and improve their psychological status. Ergonomics, on the other hand, helps to ensure the task, the tools and equipment used in task performance, and the environment, in which the employees work match their needs.

LITERATURE REVIEW

Fernandez (1995) defines ergonomics as the design of the workplace, equipment, machine, tool, product, environment and system, taking into consideration the human's physical, physiological, biomechanical, and psychological capabilities, and optimizing the effectiveness and productivity of work systems while assuring the safety, health, and wellbeing of workers. Cooper and Kleiner (2001) mention that ergonomics, also known as human factors or human engineering, basically describes the interaction between employees and their job functions, with the emphasis being on reducing unnecessary physical stress in the workplace. Wilson (1995) defines ergonomics as the practice of learning about human characteristics and then using that understanding to improve people's interaction with the things they use and with the environments in which they do so.

In general, ergonomics is meant to fit the task or work environment to the individual employee, not the individual to the task or the environment. Therefore, the design of the office should be in accordance to the demands of a specific task and the requirements of the workers to perform the task over a certain period of time.

When the task demands and the worker's requirements change, the work, procedures and work tools should be redesigned in order to accommodate the changes. In offices, there must be procedures or techniques of evaluating the task demands and workers requirements so that the employees can go well with the environment in which they work.

Most scholars and researchers (e.g. Robichaud, 1958; Brooks, 1998; Attaran & Wargo, 1999) have agreed that office ergonomics should not be restricted to cover only the individual workstation components. The scope should be broadened to include the environment in which the individual works. Robichaud (1958) suggested that there are six elements, which can contribute to the efficiency and attractiveness of the office interior. They are interior building structure, walls and partitions, lighting and visual comfort, floor covering, air comfort, and sound control. Brooks (1998) suggested that office layout and space planning should include the furniture (desks, chairs, storage, and PC's) office environment (lighting, temperature, ventilation and noise), compliance with health and safety regulations, and working procedures. Attaran and Wargo (1999), in addition, recommended that office ergonomics should include department area design (work area, ambient lighting, flooring and meeting spaces), workstation (desks, chairs, desk lighting, tools, and technology), and work area (non-office area). Therefore, the elements in the office ergonomics can be redefined as follows: First, the departmental area design can be divided into work areas, ambient lighting, flooring, and meeting spaces. Second, the workstation area consists of desks, chairs, and personal computers. Third, the office environment includes office temperature, noise, and the working procedures.

Ergonomically conducive working environment is crucial in generating satisfaction among the employees. A number of studies provide evidence to this assertion. Studies by Sundstrom and Town (1994) on the relationship between office noise and environmental satisfaction, job satisfaction and job performance, have found that office noise such as telephone ringing, noise from office equipment and combined source negatively affect employee job satisfaction. Annunziato (2000) reported that innovative workspace design that optimize its setting's potential, enhances general staff satisfaction.

Vischer (1999) also mentioned that if there is a better fit between work setting's design and user tasks, the office could more effectively support work performance and improve productivity. Ilozor, et al (2002), in investigating organizational performance relative to innovative work settings, found that to some extent, the physical properties and design of the workplace could influence organizational performance.

RESEARCH METHODOLOGY

Since the study was intended to represent the government employees from the whole state of Terengganu, the respondents' were carefully selected to represent all the districts in the state of Terengganu. 57 persons or 11.1% were from the district of Kemaman. 60 persons or 11.7% were from the district of Dungun and Marang. 158 persons or 30.7% were from the district of Kuala Terengganu. 59 persons or 11.5% were from the district of Hulu Terengganu. 62 persons or 12% were selected from the district of Setiu. And, 59 persons or 11.5% were selected from the district of Besut.

The respondents selected from the Federal Government offices numbered 188 or 36.5%. 121 respondents or 23.5% were selected from State Government offices. 65 respondents or 12.6% represented local Government offices. And, 141 respondents or 27.4% were selected among the Semi Government employees.

Standardized questionnaire was used in a survey to access the employees' perceptions about different aspects of the working environment including performance, work area perceptions and demographic profiles. Nine statements on performance dimensions, four questions or statements with regard to environment satisfaction and five questions or statements measuring job satisfaction were adapted from Sundstrom and Town (1994). Twenty questions or statements to assess the employees' perceptions on the elements of ergonomics were adapted from Brooks (1998). Respondents were required to answer a five-point Likert-type scale, ranging from consistently unsatisfactory to consistently satisfactory. Section three of the questionnaire contains questions on demographic factors.

The data collected was analyzed using the Statistical Package For Social Science (SPSS) to measure the degree of differentiation and association. As the instrument used in the study permits the production of interval data, Multivariate Analysis of Variance (MANOVA), Independent Samples t-tests, multiple regression analysis and Pearson Correlation Coefficient, they were used to measure the degree of associations between variables.

FINDINGS AND DISCUSSION

Differences on Ergonomics Dimensions

Dimensions	Types of Org.	Types of Organizations			
		Federal Govt.	**State Govt.**	**Local Govt.**	**Semi Govt.**
Lighting	**Federal Govt.**	0	-	-	-
		1.000			
	State Govt.	0.1519	0	-	-
		0.060	1.000		
	Local Govt.	**0.2359**	0.0840	0	-
		0.019	0.485	1.000	
	Semi Govt.	0.0443	-0.1076	-0.1916	0
		0.571	0.258	0.107	1.000
Meeting room	**Federal Govt.**	0	-	-	-
		1.000			
	State Govt.	**-0.2963**	0	-	-
		0.007	1.000		
	Local Govt.	-0.1982	0.0981	0	-
		0.161	0.440	1.000	
	Semi Govt.	-0.1773	0.1190	0.0209	0
		0.109	0.281	0.883	1.000
Office noise	**Federal Govt.**	0	-	-	-
		1.000			
	State Govt.	-0.1255	0	-	-
		0.107	1.000		
	Local Govt.	0.1187	**0.2441**	0	-
		0.224	**0.026**	1.000	
	Semi Govt.	-0.0355	0.0900	-0.1541	0
		0.641	0.305	0.161	1.000

Analyzing the differences on ergonomic dimensions among the government offices, several t-tests were conducted by comparing the mean scores obtained from the survey. For the first dimension, i.e. office arrangement, the result shows that there was no significance different among the government offices in terms of office arrangement.

In terms of lighting, only federal and local government offices were found to be significantly different with (α = 0.019, MD = 0.2359) at a 0.05 significant level. Federal government employees perceived higher satisfaction on lighting compared to the employees from the Local Government offices.

With regard to meeting room, only Federal Government and the State Government were found to significantly different between one another at a 0.05 significant level (α = 0.007, MD = -0.2963). Surprisingly, the State Government employees perceived higher satisfaction on this dimension compared to the employees from the Federal Government.

In terms of office noise, only the State Government and Local Government displayed significantly different relationships (α = 0.026, MD = 0.2441). The State Government employees perceived higher on satisfaction with office noise compared to the employees from the Local Government offices.

There was no significant difference in terms of office arrangement, office floor, office desk, office chairs, personal computer, office temperature, and office procedure at a 0.05 significant level.

Multiple Regression Analysis: Performance Dimensions

Dependent Variable	Independent Variables	Beta	t-value	Sig.
Overall Performance r² = 0.481	Amount Of Work	0.122	3.029	**0.003**
	Quality Of Work	0.157	3.513	**0.000**
	Meeting Deadlines	0.085	2.093	**0.037**
	Error Avoidance	0.041	1.026	0.305
	Taking Responsibility	0.064	1.557	0.120
	Ability To Use Creativity	0.112	2.757	**0.006**
	Get Along With People	0.182	4.633	**0.000**
	Dependability	0.200	4.545	**0.000**

The results of the Multiple Regression Analysis show which independent variables contribute significantly to predict the performance of the employees. The regression model is significant (F = 0.000) with the r² = 0.481 indicating that 48.1% of the variations in the model have been explained by the independent variables. Out of eight independent variables, six of them were found to be significant predictors of overall performance at 0.05 acceptance level.

In government offices, factors like amount of work, quality of work, meeting deadlines, ability to use creativity and dependability are perceived by the employees to be the important elements that affect employees' overall performance. Therefore, management should pay their closest attention to these aspects of work in the quest for performance improvement.

Determinants of Performance, Environment Satisfaction and Job Satisfaction

Dependent Variables	Independent Variables	Beta	t-value	Sig. value
Performance r² = 0.194	Office Arrangement	0.241	4.408	**0.000**
	Lighting	-0.025	-0.479	0.632
	Office Floor	0.016	0.288	0.774
	Meeting Room	0.073	1.418	0.157
	Office Desk	0.054	0.962	0.337
	Office Chair	**0.058**	1.114	0.266
	Personal Computer	**0.059**	1.193	0.233
	Temperature	-0.036	-0.819	0.413
	Office Noise	**0.102**	2.322	**0.021**
	Office Procedure	**0.095**	2.127	**0.034**
Environment Satisfaction r² = 0.596	Office Arrangement	**0.547**	14.143	**0.000**
	Lighting	0.043	1.160	0.247
	Office Floor	**0.083**	2.114	**0.035**
	Meeting Room	0.089	2.441	**0.015**
	Office Desk	0.101	2.558	**0.011**
	Office Chair	0.049	1.338	0.182
	Personal Computer	0.037	1.074	0.284
	Temperature	-0.011	-0.356	0.722
	Office Noise	0.046	1.478	0.140
	Office Procedure	-0.010	-0.320	0.749
Job Satisfaction r² = 0.438	Office Arrangement	0.427	9.368	**0.000**
	Lighting	**0.086**	1.956	**0.050**
	Office Floor	-0.071	-1.542	0.124
	Meeting Room	**0.090**	2.103	**0.036**
	Office Desk	**0.139**	2.975	**0.003**
	Office Chair	0.044	1.029	0.304
	Personal Computer	0.055	1.324	0.186
	Temperature	**-0.055**	-1.470	0.142
	Office Noise	0.091	2.481	**0.013**
	Office Procedure	0.054	1.464	0.144

In establishing the determinants of the three dependent variables; performance, job satisfaction and environment satisfaction, several multiple regression analyses were carried out. The results are exhibited in the table above.

The first regression model (performance as the dependent variable) showed low r^2 value ($r^2 = 0.194$), meaning that only 19.4% of variances in the model were explained by the independent variables. The second model (environment satisfaction with the dependent variable) showed higher r^2 value ($r^2 = 0.596$), meaning that 59.6% of the variances in the model were explained by the independent variables. And, the third model (job satisfaction as the dependent variable) showed quite high r^2 value ($r^2 = 0.438$), meaning that 43.8% of the variances in the model were explained by the independent variables.

By comparing the Beta values from all the three models, the determinants for the dependent variables respectively were obtained. Office chair (0.058), personal computer (0.059), office noise (0.102), and office procedure (0.095) were found to be the factors for performance. For environment satisfaction, office arrangement (0.547), and office floor (0.083) were found to be its determinants. And, for the last model, lighting (0.086), meeting room (0.090), office desk (0.139), and temperature (-0.055) were found to be the determinants of job satisfaction.

Additionally, some factors of the dependent variables were found significant at a 0.05 significance level. For the first model (performance as the dependent variable), office noise and office procedures were found to be significant predictors of job performance. In the second model (environment satisfaction as the dependent variable), office arrangement, and office floor were found to be the significant predictors of environment satisfaction. And, in the third model (job satisfaction as dependent variable), lighting, meeting room and office desk were found to be the significant predictors of job satisfaction.

CONCLUSION

The study had discovered several findings to be considered by the management of the organizations, which include the employees' performance, ergonomic factors and the effects of personal characteristics of employees towards their perceptions on various aspects of their jobs. Pertaining to performance of the employees the management should focus on the amount of work, the quality of work, meeting deadlines, the ability to use creativity, getting along with people and dependability.

Employees' perceptions towards the elements of office ergonomics, are different among various government offices in terms of lighting, meeting room and office noise. Federal government employees perceived higher satisfaction on 'lighting' compared to the employees from the Local Government offices. Conversely, the State Government employees perceived higher satisfaction on 'meeting room' compared to the employees from the Federal Government. Besides, the State Government employees perceived higher tolerance to 'office noise' compared to the employees from the Local Government offices. Therefore, the management can play their roles to identify and adopt the best practices from each other to improve the environment and working conditions of their own offices respectively.

Office ergonomics have been found to play an important role in influencing employees' performance, environment satisfaction and job satisfaction. Office chair, personal computer, office noise, and office procedures are found to influence employees' performance. Similarly, office arrangement, and office floor are observed to influence employees' environment satisfaction. Likewise, lighting, meeting room, office desk, and temperature was discovered to mold and shape employees' job satisfaction.

IMPLICATIONS FOR FUTURE RESEARCH

It is suggested that for future research, in-depth streamlined studies should be conducted in improving each and every aspect of ergonomics practice in the office. For example, the future study should identify the sources of office noise and how to minimize the problem where it can affect officer performance as a whole.

Secondly, a similar study should be broadened to incorporate the private sector as well so that the findings can be applied to the various types of organizations. This will also further ascertain the effects of ergonomics practices in offices in a more generalized manner. Last but not least, the future study should consider a wider geographical scope to include other states from different regions of Malaysia. The findings will be more comprehensive and accurate to represent the whole population.

REFERENCES

Annunziato, L. (2000), "Attracting New Recruits", In Ilozor, Ben Dozie; Love, Peter E.D. & Treloar, Graham (2002), "The Impact Of Work Settings On Organizational Performance Measures In Built Facilities". *Facilities*, Vol. 20, No. ½, pp. 61-68.

Attaran, Mohsen & Wargo, Brian D. (1999), "Succeeding With Ergonomics In Computerized Offices", *Work Study*, Vol. 48, No. 3, pp. 92-99.

Brooks, Ann (1998), "Ergonomics Approaches To Office Layout And Space Planning", *Facilities*, Vol. 16, No. 3/4, pp. 73-78.

Cooper, Chad & Kleiner, Brian H. (2001), "New Developments In Ergonomics", *Management Research News*, Vol. 24, No. 3/4, pp. 114-117.

Fernandez, Jeffrey E. (1995), "Ergonomics In The Workplace", *Facilities*, Vol. 13, No. 4, pp. 20-27.

Ilozor, Ben Dozie; Love, Peter E.D. & Treloar, Graham (2002), "The Impact Of Work Settings On Organizational Performance Measures In Built Facilities". *Facilities*, Vol. 20, No. ½, pp. 61-68.

Robichaud, Beryl (1958), *Selecting, Planning And Managing Office Space*, NY: Mcgraw-Hill, Inc. pp. 116-182.

Sundstrom, Eric & Town, Jerri, P. (1994), "Office Noise, Satisfaction And Performance", *Environment & Behavior*, Vol. 26, Issue 2, pp. 195-223.

Vischer, J.C. "Strategic Work-Space Planning", In Ilozor, Ben Dozie; Love, Peter E.D. & Treloar, Graham (2002), "The Impact Of Work Settings On Organizational Performance Measures In Built Facilities". *Facilities*, Vol. 20, No. ½, pp. 61-68.

Wilson, J.W. (1995), "A Framework And A Context For Ergonomics Methodology", In Brooks, Ann (1998), "Ergonomics Approaches To Office Layout And Space Planning", *Facilities*, Vol. 16, No. 3/4, pp. 73-78.

Japanese Official Development Assistance (ODA) to Malaysia
Case Studies of Miyazawa Initiative and Selangor Dam Construction

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ABSTRACT

This paper reviewed Japan's economic assistance to Malaysia. Since the mid of 1950s, Japan has been providing various types of foreign aid to Malaysia. This paper carried out two case studies on recent developments in Japan's ODA program to Malaysia that gained some prominence. The first case is the New Miyazawa Initiative. When Asian economies were fighting the consequences of the economic crisis in 1997-1998, the Japanese government came up with its own rescue package, the so-called "New Miyazawa Initiative", to help the ailing Asian economies. Japan's offer of help was positively received by the Malaysian government and the mass media that described it as a timely and much needed measure. The second case to be reviewed here is the construction of the Selangor Dam for which Japan has also provided funds. The plan was met with a mixed reaction and attracted the criticisms of local residents. In comparing the two cases, in the former case, it should be noted that Japan properly assessed the needs of the aid recipients and was able to offer a viable alternative solution to the problem. The second case indicates that Japan's ODA programs need to pay more attention to the environmental concerns of local residents in aid recipient countries. Those populations that were directly affected by the projects should be given an active role in the projects and have compensation guarantee.

INTRODUCTION

Malaysia and Japan have been enjoying close diplomatic, economic and cultural relations since Malaysia gained independence from Britain in 1957. The ties between the two countries have been further reinforced through the "Look East" policy introduced by former Malaysian Prime Minister Tun Dr. Mahathir bin Mohamad. The "Look East" policy encouraged a closer look at the work ethics, management styles and values of successful Asian economies, such as Korea and Japan. To learn from its East Asian neighbour, the Malaysian government began sending people for further study and to attend training courses in Japan. As a result, thousands of Malaysians have graduated from Japanese universities and other educational institutions.

In the economic sphere, Malaysia and Japan maintain robust relations. In terms of international trade, Japan is one of Malaysia's biggest trade partners; its exports to Malaysia include manufacturing goods, electronic devices, and transport equipment. For Japan, Malaysia is an important supplier of natural resources, such as timber and the LNG (Liquefied Natural Gas). In recent years, Malaysian exports to Japan have diversified to include air conditioners and other electronic goods.

Besides being Malaysia's major trade partner, Japan also represents an important source of Foreign Direct Investment (FDI). Malaysia is an attractive investment destination for Japanese companies due to its excellent infrastructure and efficient, well-educated workforce. According to a survey conducted by the Embassy of Japan in Malaysia, the majority of Japanese companies in Malaysia – to be precise there are 850 out of a total of 1400 companies – are in manufacturing sector, while 200 companies are in services-related business (Embassy of Japan, 2002). Some internationally well-known companies, such as Sony, Hitachi and Matsushita, have been operating in Malaysia for more than 20 years.

Overall, Japanese FDI has been beneficial to Malaysia as Japanese companies and multinational corporations (MNCs) offer job opportunities for the Malaysian workforce and create venue for technology transfer. The presence of Japanese MNCs, however, has not always produced a positive effect in host countries. One of the drawbacks is a so-called "export of dirty industries", or a practice by developed countries to relocate their more polluting and the environmentally damaging plants to developing countries. There has been one such case in Malaysia, where residents of Bukit Merah in Perak accused a Japanese MNC of illegally dumping radioactive waste (Lo & Furuoka, 2002).

Besides bringing FDI, Japan also provides considerable amounts of foreign aid to Malaysia. This paper aims to examine Japan's foreign aid policy toward Malaysia and analyses the main issues and consequences. The Asian economic crisis in 1997-1998 opened a new chapter in bilateral relations between Japan and Malaysia. Despite the fact that Japan had undergone a decade-long economic stagnation, the Japanese government came up with its own rescue package, a so-called the "New Miyazawa Initiative", and offered financial assistance to the ailing Asian economies. This paper raises questions of whether Japan disburses its foreign aid effectively and whether Japan's economic assistance has produced positive impact on the aid recipients.

Overall, the "New Miyazawa Initiative" was well accepted by the Malaysian government and had received positive comments from the local mass media. However, plans for the construction of the Selangor Dam have met opposition and attracted criticisms from the Malaysian public and non-governmental organizations.

This paper consists of four sections: Section 1 analyses the general characteristics of Japanese foreign aid policy, Section 2 discusses Japan's aid policy toward Malaysia, Section 3 offer a descriptive analysis of the two case studies, i.e., the New Miyazawa Initiative and the Selangor Dam project, and Section 4 will conclude with a discussion of the findings.

JAPAN'S FOREIGN AID POLICY

Provision of foreign aid is one of the pillars of Japanese diplomacy. It is also an important policy instrument for the Japanese government. There have been cases when the government used its economic assistance to influence domestic policies and improve political situations in developing countries. Such reliance on foreign aid as a policy instrument by the Japanese government is due to the fact that all military actions are prohibited by Japan's Constitution, which renounces the use of military force for conflict resolution.

Japan became a donor of foreign aid in 1954, when it joined the Colombo Plan and began accepting technical trainees from Asian countries. The year 2004 marks the 50th anniversary of Japan's becoming an aid donor country. The event is viewed as an important landmark in Japan's foreign aid-giving history (MOFA, 2004a).

An interesting fact is that Japan started giving economic assistance when itself was a poor country dependent on foreign aid. Until the 1960s, Japan was one of the major receivers of funds from the World Bank and other international organisations. This means that for some period of time, Japan had been a donor-cum-recipient country in foreign aid regime. It was only in the year 1990 that Japan finally repaid all loans it had previously received from the World Bank *(International Development Journal,* July 1990, p.93).

As Japan's economy grew stronger, the Japanese government steadily increased the amount of foreign aid it provided. In the 1970s, the Japanese government doubled its foreign aid program. Since foreign aid-giving has been regarded by the Japanese government as a way for Japan to contribute to the development, security and prosperity of the international community and also as a means to forward the interests of Japanese business community, the Government recognised the need to streamline its foreign aid distribution practices and introduced the first Medium Term Target for Japan's Official Development Assistance (ODA) in 1977. Since then, five Medium Term Targets for foreign aid have been successfully implemented.

In 1975, the total amount of Japanese foreign aid was US $1.1 billion. In 1980, it increased to US$ 3.3 billion, thus making Japan the second largest aid donor in the world after the United States. In 1985, the amount of Japanese foreign aid reached US$ 3.7 billion. Following the Plaza Agreement of 1985, when the Japanese Yen sharply appreciated against the US dollar, the total amount of Japan's ODA valued in US dollars soared. The year 1989 saw Japan achieved the status of being the top aid donor country in the world and it was an epoch-making year in the history of Japan's foreign aid giving (Furuoka, 2002).

The emergence of Japan as the largest aid donor coincided with the onset of economic stagnation in Japan. With the Japanese economy sliding into recession, taxpayers in Japan began to doubt whether disbursing huge amounts of money, as foreign aid in time of domestic economic hardship was justifiable. To abate public concern and utilize increasingly limited tax avenues more efficiently, the Japanese government took measures to make the process of ODA disbursement more transparent and accessible to the scrutiny of the general public (MOFA, 2002).

In addition to criticisms from within the country, Japanese ODA programs became the focus of criticisms from abroad. Observers and experts on foreign aid pointed out that the Japanese government's preference for giving more bilateral loans rather than bilateral grants had burdened aid recipient countries and undermined the philosophy and spirit of aid giving. Japan has become a "debt collector" from the poor countries. As *The Economist* commented, "Although Japan gives large dollars of money each year, it also collects large debt payments from poor countries. Lenders have a right to be repaid, but this makes its net contribution look far less impressive than that of other rich countries" (*The Economist,* May 8, 2004, p.29).

JAPAN'S FOREIGN AID TO MALAYSIA

Malaysia has been one of the important destinations for Japanese ODA. The Japanese government gives foreign aid to Malaysia to assist the latter's economic development. On per capita basis, Malaysia is the largest recipient of Japanese bilateral loans in Asia. From January 1969 to March 2001, Malaysia received 827.4 billion Japanese Yen (RM 26.39 billion) as bilateral loans. Divided per person, the amount would be equal to approximately RM 1,165, the highest in Asia (*New Straits Times,* August 21, 2001).

More recently, in 2003, the Japanese government decided to provide 82.40 billion Japanese Yen (RM 2.25 billion) as a bilateral loan for the Pahang-Selangor raw water transfer project. An additional 17 million Japanese Yen (RM0.52 million) was given as bilateral grant to acquire Japanese language learning equipment for a residential school in Miri, Sarawak (Embassy of Japan, 2004). Though the figures above are quite impressive, the question is: Why does Japan continue giving large amounts of foreign aid to Malaysia, which is a relatively wealthy country among the developing countries?

On the official level, the MOFA gives four reasons why Japan continues providing foreign aid to Malaysia. First, Malaysia is one of Japan's neighbours in Asia. Second, Malaysia and Japan maintained a very good bilateral relation in economic, diplomatic, and cultural spheres. Third, despite Malaysia's impressive economic development, the country still faces some problems, such as the environmental deterioration and income discrepancies, thus cutting or reducing foreign aid would be a premature step. Forth, after the financial crisis in 1997-1998, Malaysia has made an effort to reform its economic system and thus needs Japan's assistance to carry out the reforms (MOFA, 2004b).

Besides official explanations, there seems to be other reasons why Japan provides substantial economic assistance to Malaysia. Researchers pointed out that by providing economic assistance to Malaysia, Japan is taking care of its own strategic interests. A specialist on Japanese ODA, Robert Orr (1987) provided an additional insight into Japan's ODA program and gives two reasons why Japan is keen to give economic assistance to Malaysia. First, Malaysia occupies a strategic location on Japan's sea route to Middle Eastern countries from where Japan imports petroleum. Second, Malaysia is one of Japan's major providers of essential natural resources.

Though ostensibly Japan provides foreign aid to Malaysia to assist the latter's economic development, three aspects of Japan's aid policy toward Malaysia have become the focus of criticism. First of all, researchers and specialists maintain that the Japan's ODA program is primarily designed to safeguard Japan's own economic interests. As Aslam and Piei argued, "Since 1976, Japan has been the second largest source of external finance to Malaysia after the United States… But Japan extends the aid to Malaysia primarily to promote its own commercial and industrial interest" (Aslam & Piei, 1994, p.39).

Secondly, as substantial amounts of Japanese ODA had been given to Malaysia in the form of bilateral loans, there were concerns that repayment of the loans could become a financial burden for Malaysia. If we were to look at the figure, from 1995 to 2000, Japan has provided US$ 426.21 million (RM 1,619 million) to Malaysia as bilateral grant, that is, aid that does not require repayment. In the same period of time, Malaysia's repayment of loans to Japan amounted to US$ 810.91 million (RM 3,081 million) (JICA, 2002). This means that Japan's net foreign aid disbursement to Malaysia was negative. In other words, the amount of money that Malaysia has to repay Japan exceeded the amount of aid it received from Japan.

Finally, the high interest rates attached to Japanese loans were also subjected to criticism. This prompted a prominent Malaysian political leaders to suggest that Japan should review its aid policy and reduce interest rates of its loan since "the intention was a soft loan to help poor countries but has resulted to be a very high interest loan" (*New Straits Times,* March 21, 1996).

In the following sections, case studies of two recent episodes of Japan's ODA program in Malaysia will be carried out, i.e., the New Miyazawa Initiative and the Selangor Dam construction project. Both episodes have attracted attention from the Malaysian mass media and public. However, if the New Miyazawa Initiative had been received positively, then the construction of Selangor Dam had attracted heavy criticisms.

CASE STUDY ONE (THE NEW MIYAZAWA INITIATIVE)

When the economic meltdown started in Thailand in 1997 and spread to other countries in the region, such as Malaysia, Indonesia, the Philippines, and South Korea, the Japanese government expressed its willingness to offer assistance to the ailing Asian economies. To help abate dire consequences of the crisis, Japan announced that it would provide US$ 4 billion to Thailand in August 1997, US$ 5 billion to Indonesia in November 1997, and US$ 10 billion to South Korea in December 1997.

In the initial stage, the Japanese government worked in cooperation with the IMF and used its funds to reinforce IMF's programs. Among the countries that opted to apply to the IMF for assistance were Thailand, Indonesia and South Korea. The Malaysian Government decided against borrowing money from the IMF. Instead, in order to overcome financial problems that were partially caused by the "contagion effect" of the crisis, it introduced capital controls.

The IMF's policies aimed at abating the consequences of the crisis were quite severe. This raised doubts among some experts on the adequacy of IMF's measures. For example, Professor Jeffrey Sachs from Harvard University noted that the IMF have made a wrong diagnosis and thus has prescribed a wrong "medicine" to Asian countries. As Sachs has pointed out, the IMF's rescue packages were workable for those countries where the problems were caused by the public sector's debts and government's overspending. In Asian countries, on the other hand, private sector was at the root of the problem. Therefore, the IMF's demands that the countries hit by the crisis further cut government expenditures, tighten credit and carry out emergency bank closures were deemed too harsh for the already weakened economies. Furthermore, it was also argued that such measures were pushing the region into an even deeper recession (*The Star*, December 2, 1997).

As the economic situation in Asia failed to improve, contrary to what was expected, the Japanese government and top officials grew increasingly dissatisfied with the IMF's programs. One of the critics of the IMF's programs was Japan's Finance Minister Kiichi Miyazawa who "obliquely criticised the IMF-led approach to recovery based on tight monetary policies" (*Far Eastern Economic Review*, December 31, 1997/January 7, 1999).

The Japanese government decided to come up with its own rescue plan. In October 1998, it introduced an economic recovery strategy – a so-called "New Miyazawa Initiative" -- drafted by the Ministry of Finance (*Far Eastern Economic Review*, December 31, 1997/January 7, 1999). In an uncharacteristic move for the Japanese government, Japanese Prime Minister Keizo Obuchi in his speech at the Asian Leaders Summit in Hanoi in December 1998, called for greater cooperation between Asian countries without relying on help from Western countries. At the Summit, Japan promised to give foreign aid worth US$ 1.9 billion to Thailand and US$ 2 billion to Malaysia under the "New Miyazawa Initiative".

According to the provisions of the "New Miyazawa Initiative", Malaysia was to receive the following type of assistance: i) bilateral loan amounting to US$1 billion, ii) the Export-Import bank's loan totalling US$ 0.5 billion, iii) trade and investment insurance amounting to US$ 0.5 billion. The bilateral loan was to be divided between the following seven projects: 1) "Look East" Policy (US$ 127 million), 2) HELP II (US$ 75 million), 3) Universiti Malaysia Sarawak (US$ 168 million), 4) Beris dam (US$ 88 million), 5) Selangor raw water transfer plant (US$ 10 million), 6) Port Dickson power plant (US$ 445 million), 7) SMIs development fund (US$ 147 million) (Embassy of Japan, 1999).

Japanese foreign diplomacy scored a success by offering a timely help to its Asian neighbours. This step has also helped to reinforce Japan's ties with its Asian neighbours. In Malaysia, Japan's rescue package was well accepted by

the government and lauded by local mass media. A senior government official, the then Malaysian Second Finance Minister, Datuk Mustapa Mohamed, commented, "The package ("New Miyazawa Initiative") indicates Japan's seriousness and commitment to help countries in the region overcoming the financial crisis" (*New Straits Times*, October 5, 1998). The Malaysian National Economic Action Council (NEAC) (New Straits Times, January 20, 1999) appreciated the fact that under the "New Miyazawa Initiative" interest rates on the loans were low. During his visit to Japan in June 2001, Malaysian Prime Minister Tun Dr. Mahathir Mohamad expressed "Malaysia's appreciation for Japan's Yen loan in supporting Malaysia during financial crisis" (*New Straits Times*, June 9, 2001). Japanese Prime Minister Junichiro Koizumi, in his turn, assured his counterpart that Japan would continue to support Malaysia's efforts in reforming its economy.

Despite all the positive comments on the "New Miyazawa Initiative" received, the rescue package was not free of shortcomings. The main problem has been delays in the disbursement of funds, which has prompted Tun Dr. Mahathir Mohamad to comment, "Japan's aid package is so slow-footed that financial crisis would be over before it was spent" (*New Straits Times*, January 18, 1999). Observers attributed delays in the disbursement of funds to cumbersome bureaucratic procedures in Japan and excessive "red tape". To fend off the criticisms, the Japanese government maintained that before handing out the money it needed a detailed plan on how it was to be spent (*The Star*, January 18, 1999).

It should be noted that the criticism was valid, as the decision-making process of Japan's economic assistance is slow, complicated and fragmented. Any bilateral loan has to be first officially approved by several ministries and governmental agencies before the money can be disbursed, which makes the speedy delivery of funds difficult. Streamlining the approval process of ODA programs, especially in the cases of emergency aid and cutting excessive bureaucratic red tape would help to increase the efficiency of Japan's ODA program.

CASE STUDY TWO (SELANGOR DAM CONSTRUCTION PROJECT)

The Sungai Selangor Community

The Sungai Selangor Water Supply Scheme Phase III (SSP3) is a dam project governed by the Selangor State Government. The area affected is just outside of Kuala Kubu Bharu on the road to Fraser's Hill, along the Sungai Selangor, which is the ancestral land of the Temuan indigenous people. A total of 325 *orang asli* in two villages known as Kampung Pertak and Kampung Gerachi will have to be relocated to make way for the dam. According to the Centre for Orang Asli Concerns (COAC), prior consent was not obtained from the affected Temuan families (Centre for Orang Asli Concerns, 2000). It was also noted that, previous resettlement of dam affected indigenous self-sufficient communities in Malaysia was found to be highly impoverished.

The Conflict between the Environment and Development

The construction site of Sungai Selangor Dam is located in Hulu Selangor with the objective of meeting the increasing demand for water supply in Selangor and Wilayah Persekutuan. The water crisis in Selangor caused by insufficient water supply and also to support the need for future water demand, has contributed to the development of the dam in Selangor. Although Malaysia no longer emphasize on primary industries such as the export of agricultural products, forestry, etc, it still continues to give short shrift to environmental quality (Gurmit Singh, 1994). According to the Consumer Association of Penang (CAP), the dam construction area covered the rainforest, rubber plantations, orchards, two indigenous settlements, some private land, recreational and picnic spot along Selangor River, and part of Kuala Kubu Baru-Fraser's Hill road.[1] In relation to that, SMHB Sdn. Bhd has conducted an Environmental Impact Assessment (EIA) study for the project advocate Konsortium TSWA-Gamuda-KDEB. The main reason for the study was to ensure that every environmental and social aspect would be taken into consideration for the development of the dam.

The construction of the dam drew various feedbacks, especially criticism from the Non-Government Organization (NGO) as well as the public. Among the reasons they opposed the development of the Selangor dam were due to the possible negative implication towards the ecosystem and the social aspect especially the affected indigenous settlements in the area, in fact various suggestions were brought up with alternatives to the construction of the dam

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[1] Submitted by the Consumers' Association of Penang
Dated: 14 April, 1999

such as better management of water supply, better piping to prevent leakages, water supply from other states, rainwater harvesting, water conservation, water network maintenance, and acquiring water from existing lakes and dams. Besides, government could also play a role by educating the public and further create the awareness on the value of water through campaign and advertisement, and impose heavy fines on those caught stealing water.

One of the issues raised up related to the question of why there are water shortages in Selangor as Malaysia is reported as one the countries that have received a lot of rain annually. Similarly, they declined the idea that the water crisis in Selangor can be prevailed by constructing a dam since there are other alternatives that can be taken into consideration in solving the water shortages in Selangor. In addition to that, Environmental groups in Malaysia have submitted a research proposal for overcoming the water crisis in the long run with minimum environment damage and cost, relative to the negative impact of constructing a dam.

The strong opposition from the NGOs and the public also closely associated to the prior dam projects, which only provide benefit to certain parties for short-term period. In term of social aspect, a lot of people prefer to take a rest at the Pertak reservoir park, Ulu Selangor every weekend in order to overcome the increasing stress and pollution in Klang Valley. The area is known to be a favourite and essential recreation area. In addition to that, the three eco-tour centres set up along the river has provided job opportunities for the local *orang asli.* Besides, it was also found that changes in the hydrology of the river would affect the riverine life.

The disastrous environmental impact has drawn heavy criticism. In recent years, experts admitted that damming up rivers is hazardous and destructive to the environment and fragile ecosystem equilibrium as the negative impact could be unpredictable and irreversible. In the case of Selangor Dam construction, the public doubts the credibility of the EIA questioning the rationale for its assessment on the environmental and social aspect implication. According to Dato Dr. Salleh Mohd. Nor, president of Malaysia Nature Society (MNS), although special committees are formed to monitor large projects such as the Selangor dam, the enforcement has been inconsistent, functioning only when unpleasant incidents happen.

CONCLUSION

For several decades, Malaysia and Japan have been enjoying very good bilateral relations. The two countries maintain close diplomatic ties, conduct active cultural exchange and have robust economic relations. Japan has been a major source of FDI to Malaysia. It also provides Malaysia substantial economic assistance. Though Japanese ODA programs have been criticised for being commercially motivated, overall, Malaysia has benefited from the economic assistance it received from Japan.

Japan's readiness to offer financial assistance to the Asian economies hit by the economic crisis in 1997-1998 was highly appreciated by its Asian neighbours, including Malaysia. By introducing its own rescue package, the Japanese government has scored a diplomatic success and further reinforced its good ties with Asian countries. In Malaysia, the fact that the "New Miyazawa Initiative" was launched at a time when Japan was undergoing economic difficulties did not go unnoticed and was commented upon by both the Government and local mass media.

However, much still needs to be done to upgrade the efficiency and enhance the image of Japan's ODA program. First of all, the Japanese government may want to consider giving more bilateral grants than bilateral loans to its aid recipients, so that the former is not burdened with repayments of loans. Second, aid-giving mechanism needs to be transparent and accessible for public scrutiny. Third, excessive bureaucratic red tape needs to be cut in order to ensure a speedy delivery of funds. Fourth, there is a need for a proper assessment of the impact that a project supported by Japan's ODA program is likely to produce, in the aid recipient country. Avoiding funding projects that are not beneficial to the local people or raise opposition from local residents would not only help steer clear of controversy and bad publicity but also maintain the good image of Japan's ODA program. Finally, communities that were directly affected by the projects should be given an active role in the projects and given compensation guarantee. More serious questions have to be addressed such as the validity of the projects, the fundamental assumptions and methodology before Japan's ODA program can consider approving the grant.

REFERENCES

Aslam, M., & H. P. Mohd (1994). Malaysia-Japan: Unequal Trade Partner, in Jomo K.S. (Ed.), *Japan and Malaysian Development: In the Shadow of the Rising Sun",* London, Routledge, 21-43.

Centre for Orang Asli Concerns (2000). *Comments on the project EIA submitted to the Department of Environment.*

Chin, K.C. (December 28, 1998) Japan a Good Friend in Times of Need, *The Star*

Embassy of Japan in Malaysia (1999). *Japanese Financial Package to Malaysia*. Retrieved February 13, 1999, from Embassy of Japan's home page, www.embjapan.org.my.

Embassy of Japan in Malaysia. (2002). *Mareishia Zairyuhojinsu tou no chosakkeka ni tsuit.* Retrieved November 4,2002, from http://www.my.embjapan.go.jp.

Embassy of Japan in Malaysia (2004). *Japan-Malaysia Relations.* Retrieved June 8, 2004, from http://www.mofa.go.jp/region/asia-paci/malaysia/index.html.

Vatikiotis, Michael (December 31, 1998 and January 7, 1999) Help Yourself, *Far Eastern Economic Review*

Furuoka, F. (2002), *Human Rights, Democracy and Japan's Aid Sanction Policy.* Unpublished Ph.D. thesis. Penang: Universiti Sains Malaysia.

Gurmit Singh, K. S. (1994, August). *Protection of the Environment and Health: Meeting the Challenges. A Prescription for Global Health and Security.* Fourth Asia-Pacific Regional Conference, Kuala Lumpur.

Japan International Cooperation Agency (2002). *ODA Disbursements to Malaysia.* Retrieved July 22, 2002 from JICA Malaysia's homepage www.jica.org.my.

Japan's Generous Aid Package (October 6, 1998) *New Straits Times*.

Khor, M (December 2, 1997) Chance to Find Solutions to Crisis, *The Star*.

KL welcomes Japan's US$ 30 billion Aid (October 5, 1998) *New Straits Times*.

Lo, M. C., & Furuoka, F. (2002*). Industrial Waste Disposal and the Environment in Malaysia: Lessons from Japan.* In J. Ali, B. A. Rahman, Z. Mohamed and N. Zainuddin (Eds.), *Disaster Management: Strengthening the National Security Capacities (pp. 271-284).* Kedah: Penerbitan Ustara.

Ministry of Foreign Affairs (2002), *Japan's Official Development Assistance: White Paper 2001,* (Tokyo: Ministry of Foreign Affairs).

Ministry of Foreign Affairs (2004a). *Kokusai Kyoryoku goju shunen kinen jigyou nittsuite (on the special events to commemorate 50 anniversary of international co-operation).* Retrieved June 8, 2004, from http://www/mofa.go.jp.

Ministry of Foreign Affairs (2004b). Country Policy 1999. Retrieved April 2,2004, from http://www.mofa.go.jp/policy/oda/summary/1999.

Nihon mo Katte Tojokoku datta (Japan also was a developing country)(July 1990) *Kokusai Kaihastsu Janaru*.

Not so nice (May, 8, 2004), *The Economist*.

Orr, R. M, Jr. (1987). The Rising Sun: Japan's Foreign Aid to ASEAN, the Pacific Basin and the Republic of Korea. *Journal of International Affairs,* 41, 1, 39-62.

Raj, T.M. (January 20, 1999) Japan Agrees to Malaysia's Proposal for Fresh Loans, *New Straits Times*

Ruhanie, N. (August 21, 2001) Malaysia is largest recipient of Japan's ODA loans *New Straits Times*

Samad, N. (June 9, 2001) Japan to carry out on giving financial aid, *New Straits Times*.

Selvarani, P. (January 18, 1999) Tokyo to Probe Delay of Rescue Package Disbursement, *New Straits Times*

Tan, K.P. (January 18, 1999) Japan Surprised at PM's Comments on Aid Package, *The Star*.

Zielinski, Robert (June 15, 1998) Role Model from Hell, *Time*.

Total Productive Maintenance in a Local Automotive Components Manufacturer: A Case Study

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ABSTRACT

Total Productive Maintenance (TPM) is an integrated approach to the maintenance functions of an organization. The objective of TPM is to create an active participation among employees in maintenance functions. TPM focuses on reducing machine downtime, improving product quality, and pre-planning of maintenance functions. This study describes the implementation (preparation phase) of a TPM program at one of a local automotive components manufacturer by concentrating towards the autonomous maintenance elements. This case study was carried out to identify the elements that had been implemented as well as the impact of TPM introduction towards the company's performance especially in terms of downtime, productivity and quality. Generally, the findings show a few important points that need to be considered by the company are highlighted which are training, top management commitment, inconsistency of machines maintenance follow-up, and human factors. Nonetheless, recommendations for further improvements are given in order to ensure the successfulness of TPM implementation.

INTRODUCTION

Total productive maintenance (TPM) aims to increase the availability of existing equipment in a given situation, reducing in that way the need for further capital investment (Bohoris et. al, 1995). Based on small group activities TPM takes productive maintenance organisation-wide, gaining the support and co-operation of everyone from top management down (Shirose, 1992). Instrumental to its success is the investment in human resources which further results in better hardware utilization, higher product quality and reduced labour costs (Takahashi, 1981). One of the main aims of TPM is to increase productivity of plant and equipment in such a way as to achieve maximum productivity with only a modest investment in maintenance (Van Der Wal and Lynn, 2002). This can be done by: improving and maintaining equipment and facilities at an optimal performance level in order to reduce their life-cycle costs. Cost-effectiveness can be a direct result of an organisation's ability to eliminate the causes of the reduction in equipment effectiveness (Al-Hassan *et al.*, 2000, p. 597).

This study considers the steps needed to develop and implement truly autonomous machine tool maintenance management systems and outlines the benefits that can be obtained from such approaches. The company, namely IESB is located in Nilai Industrial Estate, Negeri Sembilan, and equipped with the state-of-the-art production facilities, employing the latest technology of roll-forming, co-extrusion, flocking and stretch bending processes. IESB is the sole local supplier of these products to Perusahaan Otomobil Nasional Berhad (PROTON) and Perusahaan Otomobil Kedua Sdn Bhd (PERODUA) and remains the only manufacturer that possesses the know-how to produce these components in the Malaysian market. Table 1.1 shows the products and facilities that are available at IESB. The products are generally used to seal around windows, doors and other gaps or joints in the vehicle's exterior.

Table 1: Products and Facilities at IESB

Products	Beltline Mouldings Weather strip Mouldings Roof/Pillar Drip Mouldings Front/Rear Glass Mouldings
Facilities	Roll forming line (2 units) Horizontal and vertical extrusion machines (2 units) Flocking machine Cell-type assembly line consisting of stretch bending machines, presses and injection machines (9 lines)

This case study has been focussed on the autonomous maintenance program at production of Beltline moulding process. There were activities that carried out at one of the Production Line, namely Line C that comprises processes such as cutting, pressing, and injection

LITERATURE REVIEW

Total Productive Maintenance (TPM) is keeping the current plant and equipment at its highest productive level through cooperation of all areas of organization (Besterfield et al., 2003). The Japanese Institute of Plant Maintenance (JIPM) developed total Productive Maintenance in Japan in 1971. TPM has been defined in a number of ways in the literature. For instance, Maggard (1989) asserts, "Total Productive Maintenance (TPM) is a partnership between the maintenance and production organisation". In addition, Rhyne (1989) suggests, "TPM is an attitude, process, cultural change to operate equipment under optimum conditions". However, according to Hartman (1992), "TPM permanently improves the overall effectiveness of equipment, with the active involvement of operators". And, "TPM is a combination of American preventive maintenance and Japanese concept of total quality management and total employee participation" (Nakajima, 1984). Additionally, Nakajima (1984) illustrates Total Productive Maintenance as an organisational philosophy that focuses on equipment and operations to achieve optimum results. Organisations are focusing on minimum inventory level, the best lead-time for delivery, and the best quality. Organisations face major challenges in the area of competition and quality. In order to produce quality products, companies must have good manufacturing techniques and equipment.

According to Nakajima (1984), TPM focuses on the following points:
- Restrict unnecessary investment for the existing machines in terms of overhauling.
- Maximise the life expectancy of existing machines by a good maintenance program.
- Enhance rate of equipment utilisation for output.
- Achieve quality of the product by maintaining the machines in good condition.
- Reduce the manufacturing cost through machine improvement.
- Ensure all employees participate in all plant activities.

As best stated by McKone, Schroeder and Cua (1999), TPM is designed to maximise equipment effectiveness (improving overall efficiency) by establishing a comprehensive productive-maintenance system covering the entire life of the equipment, spanning all equipment-related fields (planning, use, maintenance, etc.) and, with the participation of all employees from top management down to shop-floor workers, to promote productive maintenance through motivation management or voluntary small-group activities. Thus, Prickett (1999) describes that TPM is an established methodology aimed at improving the availability of machine tool systems and product quality. This is done via the effective management and maintenance of industrial plant. Generally, according to the Japanese Institute of Plant Maintenance (JIPM), the goal of TPM is to increase productivity of plant and equipment. TPM experts Nakajima (1984), Hartmann (1992), Willmott (1997) and Wireman (1991) all agree that a common feature to TPM is to strive for the three goals of zero defects, zero accidents and zero breakdowns. Likewise, these experts also agree that the aim of TPM activities is to improve the productivity, quality costs, cost of products, delivery and movement of products, safety of operations and morale of those involved.

One of the main characteristics of TPM is its aggressive pursuit of absolute goals, such as zero breakdowns and zero defects. In order to achieve this, TPM focuses on prevention action rather than fixing a problem whenever it occurs. The two main goals of TPM are to develop optimal conditions for the workshop as a human-machine system and to improve the overall quality of the workplace environment (Productivity Press Development Team, 1992). Shirose (1995) indicates that the primary goal of TPM is to eliminate the "*six big losses*", which are breakdowns, Set-up and adjustment, Idling and minor stoppages, Reduced speed, Process defects and rework; and Start-up loss**.**

Aside from producing benefits such as job enrichment, safety enhancement, and improved flexibility of workers, Maggard (1992) has listed four goals that are the usual focus of TPM implementation such as Improve product quality, Reduce waste, Improve the state of maintenance and Empower employees. TPM has been implemented extensively worldwide. For instance, in UK there were a few companies that have been implementing TPM. The automotive industries are leaders in the UK for adoption of techniques such as world-class manufacturing (WCM), TQM, lean production and SPC initiatives. In particular, the Rover Group has been at the forefront of development and implementation of new manufacturing strategies and has shown that TQM requires both effective and efficient maintenance to be successful (Wilmott, 1997).

The obstacles to introducing TPM

Many companies were introducing TPM approach but facing a lot of difficulties. For instance, the Land Rover transmissions manufacturing plant in Birmingham, UK attempted twice during the period of 1991-1993 to implement TPM practices. However, both attempts were finally abandoned and the main reasons outlined for TPM implementation failure during the early implementation attempts include (Bamber et. al, 1999):
simultaneous introduction of TPM on too many machines;
lack of involvement of production associates (operators);
introduction of TPM to machines that were not really important to the product process.
The number of companies successfully implementing a TPM program is considered relatively small and failure has been attributed to the following three major obstacles (Bakerjan, 1994):
(1)   Lack of management support and understanding.
(2)   Lack of sufficient training.
(3)   Failure to allow sufficient time for the evolution.

The lack of management support is attributed to management not completely understanding the true goal of the TPM program. For example if management consider that TPM is a means to reduce maintenance staff, they have failed to understand the true goal and purpose of the program. The time required to change from a reactive program to a proactive approach will be considerable by some estimates it may be a three to five year venture before achieving a competitive venture for the TPM program. TPM must be seen as a long-term commitment to strive for zero losses and not a way of obtaining short-term fixes (McCarthy 1997). Windle (1993), an active management consultant implementing improvement programs, considers that limited applications of TPM from companies, which have taken the short-term perspective, have led to regressive steps, including:
•   shifting line authority for maintenance crews to production managers;
•   converting skilled maintenance personnel into routine operators;
•   pushing TPM as a means to reduce the apparent overhead of the maintenance department;
•   applying TPM principally to reduce maintenance costs.

Similarly, Davis (1997) outlines ten main reasons for TPM failure within UK manufacturing organisations as:
(1)   The program is not serious about change.
(2)   Inexperienced consultants/trainers are used.
(3)   The program is too high level, run by managers for managers.
(4)   There is a lack of structure and relationship to strategic needs.
(5)   The program does not implement change on the shop floor and is not managed.
(6)   A lack of education and training for those expected to take it on board and provide support.
(7)   Programs are initiated and run exclusively by engineering and seen by production as a project that does not involve them.
(8)   Attempts to apply TPM in the same way it is implemented in Japan, using the standard approach found in Japanese publications.
(9)   TPM teams lack the necessary mix of skills and experience.
(10)   Poor structure to support the TPM teams and their activities.

However, Cooke (2003) suggests that there are a few other obstacles that can hinder maintenance functions such as:
- insufficient use of measurement of maintenance efficiency and long-term planning;
- inadequate budgetary control in maintenance;
- too little maintenance planning and too much fire-fighting;
- a lack of appreciation of the direct costs of maintenance, e.g. the cost of the loss of asset availability;
- a low level of awareness of modern maintenance techniques of the third generation of maintenance philosophy; and
- limited connection (if any) between maintenance strategy and business strategy.

Critical success factor in implementing TPM

The five pillars of TPM are the requirement of a successful implementation of TPM (Nakajima, 1988; Yeomans, and Millington, 1997):

i. **Elimination of the six big losses to improve equipment effectiveness:** An attack upon the six losses and improvements in overall equipment effectiveness (OEE). The six losses can be stated as being: breakdowns owing to equipment failure; set-up and adjustment activities; idling and minor stoppages; reduced speed; defects in process and rework; and reduced yield between machine start-up and stable production.

ii. **An autonomous maintenance program:** Maintenance performed by equipment operators, or autonomous maintenance, can contribute to equipment effectiveness. The essence of autonomous maintenance is deterioration prevention, which involves operating equipment correctly, maintaining basic equipment conditions, making adequate adjustments, accurately recording data on breakdowns and malfunctions, and collaborating with maintenance personnel.

iii. **A scheduled maintenance program for the maintenance department:** This increases the efficiency of traditional preventive maintenance activities.

iv. **Increase skills of operations and maintenance personnel:** Here the emphasis is upon 'hard' engineering training, with production operatives become familiar with the equipment they operate and gaining the practical skills to operate and maintain it, and with maintenance staff acquiring advanced pulse monitoring, vibration analysis, oil debris analysis, etc. 'Soft' issue training is needed in the areas of raising awareness of the responsibility of all operatives for quality, training operatives to work in teams, and educating all employees in the importance of internal and external customer requirements.

v. **An initial equipment management program:** The goal is the reduction of maintenance costs and deterioration losses in new equipment by considering past maintenance data and the use of latest technology when designing for higher reliability, maintainability, operability, safety and other requirements.

There are a few companies having problems of implementing TPM successfully. For instance, Rover Group has encountered failures in earlier TPM implementation. However, the Rover Group strategic plans detailed implementation of TPM as an essential component of its strategy for manufacturing divisions. According to Bohoris *et al.* (1995) successful implementation of TPM within Rover came about with the change of the management manufacturing structure and a new emphasis on:
- production driving the TPM implementation, with maintenance assisting in the process (and involvement from the initial (planning) stages of the production associates and union of H & S representatives);
- the full utilisation of the in-house developed computerised maintenance management system (CMMS);

Davis (1997), suggests the key factors for TPM successful implementations as the followings:
- approach TPM realistically, developing a practical plan and employing program and project management principles;
- accept that TPM will take a long time to spread across the company and change existing maintenance culture;
- be determined to keep going;
- put in place, train and develop a network of TPM co-ordinators that will promote and support TPM activities every day;
- support TPM co-ordinators with time and resources, plus senior level back up;

- put in place relevant measures of performance and continually monitor and publicise benefits achieved in financial terms;

It is considered extremely important to measure performance as it gives managers the possibility to base their decisions on facts, not opinions (Maskell, 1994). Quality improvement experts Tenner and DeToro (1992) and Spenley (1992) all emphasize this need for appropriate measures of performance, to provide management focus and fact based decision making for the implementation of change to be successful.

Additionally, Bamber et. al (1999) has suggested factors that affecting successful implementation of TPM such as the followings:
(1) the existing organisation;
(2) measures of performance;
(3) alignment to company mission;
(4) the involvement of people;
(5) an implementation plan;
(6) knowledge and beliefs;
(7) time allocation for implementation;
(8) management commitment;
(9) motivation of management and workforce.

RESEARCH FINDINGS ANALYSIS

Implementation of TPM at IESB
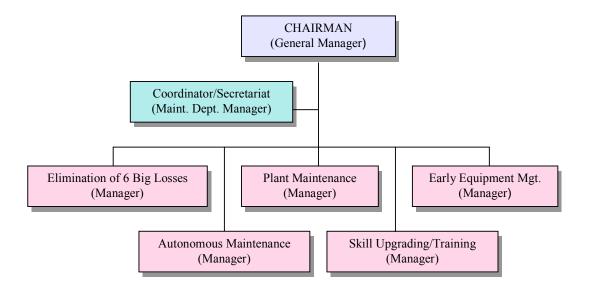
Modern manufacturing requires that to be successful, organisations must be supported by both effective and efficient maintenance. One approach to improving the performance of maintenance activities is to implement and develop the Total Productive Maintenance (TPM) strategy (Bamber, et. al., 1999). Manufacturing companies striving for world-class performance have shown that the contribution of an effective maintenance strategy can be significant in providing competitive advantage through this TPM program (Willmott, 1994). Due to the realisation of this fact, IESB decided to have a structured maintenance program implemented within its company as well. Hence, Total Productive Maintenance (TPM) was introduced this year and successfully launched in April 2001.

TPM Steering Committee

The first step in TPM development is to make an official announcement of the decision to implement TPM. Top management at IESB had informed their employees of this decision and promoted enthusiasm for the project. TPM represents a major shift in the way an organisation approaches the maintenance function and implementation usually requires a significant change in organisational structures. Being new to the program, IESB is still at the stage of preparation phase while operating slowly on the implementation phase bit by bit at the same time. A steering committee was formed to help give support and distribute the whole concept to others in the company. The TPM organisation chart was designed according to the five pillars of TPM. Chaired by the General Manager, other head of departments, and qualified engineers lead these pillars. The maintenance department manager was appointed as the coordinator/secretariat for he has the most experience in maintenance of the whole plant. This team not only consists of manufacturing or maintenance personnel but also includes a human resource representative who is in charge of the training division. TPM implementation aims at restructuring IESB's corporate culture through improvement of human resources and plant equipment. Although TPM is driven from the bottom-up approach, only management can create the vision and define success for the process and for the organisation (Maggard, 1992).

The objective of a steering committee is to monitor and evaluate the TPM activities in the plant. This includes the composition of the committee and procedure policies, guidelines, issues and concerns of the TPM program. It is not only responsible in establishing basic TPM policy and goals but also to ensure that policy and procedural issues concerning the implementation of TPM are resolved.

Figure 1: TPM Steering Committee

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                    ┌─────────────────────┐
                    │      CHAIRMAN       │
                    │  (General Manager)  │
                    └─────────────────────┘
              ┌───────────────────────────┐
              │  Coordinator/Secretariat  │
              │  (Maint. Dept. Manager)   │
              └───────────────────────────┘
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Educational Campaign

The second step in the TPM development program is TPM training and promotion which began after the introduction of the program. The objective of TPM education is not only to explain TPM, but also to raise morale and soften resistance to change, in this case, TPM. A campaign to promote enthusiasm for TPM implementation is organised at IESB; where banners, signs, flags and notice boards that bear TPM slogans are created in order to have a positive environment effect.

During the educational campaign five definition points of TPM:have been highlighted to employees as the followings:
- Aims at getting the most effective use of equipment
- Builds a comprehensive PM system
- Brings together people from all departments concerned with equipment
- Requires the support and cooperation of everyone from top managers down
- Promotes and implements PM activities based on autonomous small group activities

During the early stages, employees were trained by the management to deal with equipment on their own by improving their operation and maintenance skills and promoting autonomous maintenance. The executive levels using slide presentations and other visual materials trained shop floor workers. These educational training, basically a mere introductory to the operators on the whole concept of TPM, are carried out according to the master plan schedule prepared throughout the whole year

Other basic TPM activities

Since its operation in 1992, IESB have implemented various types of maintenance activities that are considered to be the basics of TPM. Although some of the maintenance activities were reactive in the sense that maintenance was only carried out when machines failed or stopped functioning, efforts have been taken since day one to ensure a more systematic, structured and effective maintenance and to sustain equipment reliability, even though TPM was never in the picture. These activities are discussed briefly in the subsequent sections.

Scheduled maintenance

Scheduled maintenance has been implemented since the beginning of production at IESB where all maintenance activities are carried out according to schedules; hence the term scheduled maintenance. Maintenance activities were the responsibility of the maintenance department (Production Engineering Department) at IESB. Daily operations were taken care of by the maintenance supervisors and supported by the production and QMS

(Quality Management System) department. IESB's maintenance approach mostly involves the preventive maintenance concept. It is carried out in a planned or scheduled manner. Maintenance is organised and carried out with forethought, control and the use of records to a predetermined plan. The purpose of performing preventive maintenance is to minimise and possibly eliminate breakdowns of machines.

Planned maintenance typically involves the work conducted by highly skilled maintenance technicians. As more tasks are transferred to operators through autonomous maintenance, the maintenance department takes a more proactive approach to maintenance and is able to develop a disciplined planning process for maintenance tasks, such as equipment repair/replacement, and on determining countermeasures for equipment design weaknesses (McKone, et. al., 1999).

The daily check sheets as well as the monthly check sheet that are done by the operators themselves are among the activities that fall under the preventive maintenance activities. A preventive maintenance schedule for each machine is prepared by the maintenance supervisors throughout the year to ensure that machines are maintained according to plan.

Besides what is stated above, predictive maintenance (PM) have been implemented at IESB as well. It is carried out every once in three months. Based on the downtime data gathered, critical issues are identified for each machine. If the downtimes of machines are too high, the maintenance activities will be increased accordingly. Consequently, recommendations are made for future PM activities either by the supervisors or the manager himself.

Kaizen and Five-S

Kaizen, a Japanese word that means 'continuous improvement' is a concept, which has long been commenced at IESB. Workers are highly motivated to seek constant improvement upon that which already exists. Although standards may have been met, there was always exist desire to achieve higher standards.
This concept encourages employees at IESB to give new ideas to improve things, by transforming it into written ideas in the *Kaizen* form. Each form will be rewarded with RM1.00 per unit form submitted; an attempt to attract all workers. An employee with the best *Kaizen* idea will be awarded at a special event and in addition, the information will be displayed at the shop floor area. Not only will this generate savings for the company, it will also generate a habit. The habits create a culture, which is what TPM is all about. It is hoped that by approaching this concept, it will become a culture within the company for anyone to think of ways of improvement in any aspect for the benefit of the organisation.

Another venture made by IESB in order to build this *Kaizen* culture at the work place was to enforce the 5S strategy. IESB strives to build team working through the participation by all. The question to whether workers have an interest in and attachment to their machines and are using them with care can be answered by analysing the realities of the management of the 5S's in the plant (Yoshikazu Takahashi & Takahashi Osada, 1990). The five-S's: *Seiri, Seiton, Seiso, Seiketsu* and *Shitsuke* (roughly means *organisation, tidiness, purity, cleanliness* and *discipline*) are basic principles of operations management. 5S activities are intended to qualitatively change the ways in which people think and behave, and, through these changes, to alter the quality of both equipment maintenance and the work environment.

It is the culture of IESB since day one that everybody is responsible to make sure their work place always fulfils the 5S requirement otherwise they will receive a 'reminder' during the 5S audit by the respected committee. The cleanest and tidiest area/line will be awarded in terms of certification and will be given a banner which will be displayed at their work place as an appreciation of recognition. All work place are audited, appraised and awarded on a weekly basis. Each work area is audited according to the 5S criteria listed in the *5S Implementation Audit Form.* Performed by an auditor, the categories inspected include the floor, machines, equipment, jigs and dies, work area, materials, finished good, visual control, uniform, and safety elements. For every category, these criteria are assessed and evaluated according to the appropriate scales. An audit report is displayed in the Line, for workers to evaluate themselves and improve wherever they are lacking.

Small Group Activities – QCC

The most outstanding feature of TPM's small group activity is its structure of overlapping groups integrating organisational and small group improvement activity. Introduced in 1962, these Japanese-style small group activities began with the quality control circle, or more famously known as QC circle (QCC). They are considered to be informal organisations as they are independent of the existing organisational structure and are

formed by workers. Teams called 'circles' or 'groups' set goals that are compatible with the larger goals of the company and are achieved through group co-operation and teamwork. This enhances company business results and promotes activities that satisfy both individual employee needs (self-satisfaction, success, motivation) and the needs of the organisation (Nakajima, 1988).

IESB started to have these teams since 1994. At present, there are a total of 15 teams from IESB alone, more from other subsidiaries of the Group companies. QC circle involves operators, clerical, leaders, and all supervisory levels, facilitated by the executives. IESB focuses on group effort, which involves the combination of talents and sharing knowledge, problem-solving skills, ideas and the achievement of a common goal. Several competitions/conventions were held to create the spirit of teamwork and competitiveness among the group's members. A remarkable outcome was discovered through these small group activities whereby the groups were able to reduce costs at their workplace by a large amount of money. Successful groups were given the opportunity to represent their group (or the company at a higher level convention) in any internal/external convention. Winners were awarded with a certain amount of cash at one of the annual company's events as recognition by the management of the company.

Just-in-Time (JIT)

JIT is a Japanese management policy, which has been applied in practice since the early 1970's in many Japanese manufacturing organisations. Not only was it an initiative to reduce inventories at IESB, it was an effort to respond better to the changing demands in the market. JIT places emphasis on maintaining a set production schedule, therefore it requires strong planned maintenance systems so that maintenance is conducted as scheduled rather than as a reaction to equipment problems. Many elements of preventive maintenance are interdependent with JIT. The strong interrelationship between JIT and TPM coincide with the adoption of TPM practices as it serves to substantiate the importance of preventive maintenance to undergo JIT implementation. Provision of the right material at the right time, pursuit of 100% quality, 100% of the time and the focus on continuous improvement are goals integral to JIT. Therefore, the use of TPM complements the activities that are endorsed through the current JIT manufacturing adopted at IESB.

TPM EVALUATION AND MEASUREMENT

In a manufacturing environment, a project is considered successful if it can demonstrate benefits, both tangible and intangible. Tangible benefits are those that can be directly measured or quantified, whereas intangible benefits are the opposite. However, this project was carried out to study the effects of TPM implementation towards the equipment in the plant, in terms of downtime, productivity as well as number of rejects, focusing only at Line C. This was strongly suggested by Maggard (1992), quoted:

"If your TPM implementation involves only a fraction of your total operation, the measures of success should be small unit measures."

These measures are being concerned for because they are so obvious and can be quantified. These indicators also reflect the performance of a manufacturing plant and are significant enough towards the company's performance.

Downtime trend at Line C

Ideally, breakdowns can be eliminated entirely through maintenance prevention (or TPM), or the adoption of maintenance-free design. However, the condition of most factory equipment is far from ideal. TPM was initially introduced at IESB to eliminate this type of loss, driving towards achieving Zero Defects, since zero defects and productive maintenance have a common philosophy. Downtime is defined as the total of time when machine is idle (not running). Being one of the categories of the "Six Big Losses", downtime could be due to equipment failure (caused from breakdowns), as well as setup and adjustment from exchange of die. The percentage of downtime is obtained from the equation below:

$$\% \text{ Downtime } = \frac{\text{Actual machine/tooling breakdown (hrs)}}{\text{Total production hours (hrs)}} \times 100\%$$
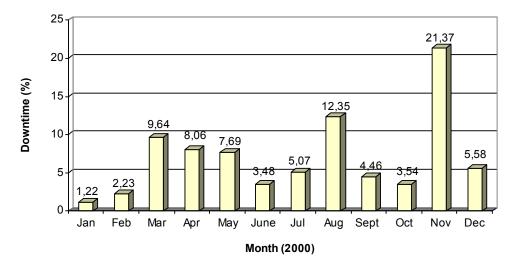
Total numbers of downtimes were recorded for the past few months, beginning February till June 2001 at Line C, and the secondary data on downtime for the year 2000 were gathered. Every year, top management will set a

target for the allowable percentage of downtime for all lines. Each line was proposed with a different target. If the downtime recorded for each month exceeds this target, causes are investigated and being counter-measured.

Downtime trend for year 2000 and 2001
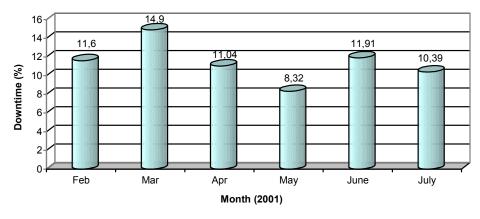
Downtime data were collected based on the Daily Downtime Monitoring sheet where recorded data were done on a daily basis. Graphs were plotted to get a full view of the downtime trend for a specific month or year.

Figure 2: Downtime Trend For The Year 2000

Month (2000)

The targeted value for allowable downtime in 2000 was set at 3.5%. Data show from Figure 2 that beginning March, all values were found to be above target, more than 3.5%. Downtime was the highest in November with a percentage of 21.37%. Also, these data fluctuates, and no common trend could be seen. This is similarly obvious in 2001, as shown in Figure 3.

Figure 3: Downtime Trend For The Year 2001

Month (2001)

Prior to the discovery of high downtime value in the year 2000 (which was below target), it was decided by the management force to increase the target of up to 6.0%. From Figure 3, it is apparent that for the whole six months, none of the data reached target. This is fairly unusual, although normal, since basic preventive maintenance have long been implemented at IESB. As an addition, it is clearly seen from the histogram illustrated (Figure 2), downtime was relatively the highest in November 2000. This could be due to the time factor where it was approaching towards the end of the year, where normally workers are demoralised and not highly motivated. Operators could also be concentrating too much on achieving the targeted production rate at every year-end without having any concern for the damage and loss they were causing when carelessness occurs and things are mishandled.
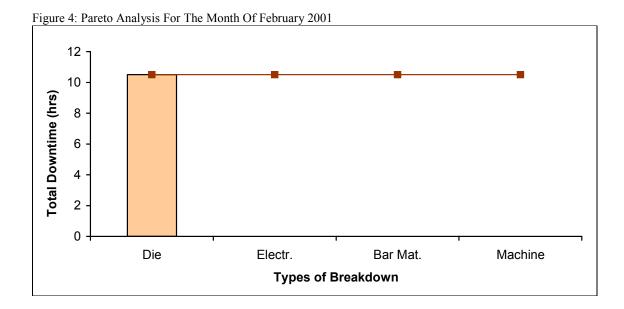
The highest machine downtime in year 2001 was only 14.9% recorded for the month of March. Although it was not as high as it was in November the year before, generally, downtime for this particular year was still high at an average. Plus, they all exceed the downtime target, which was 6.0%.

Types of breakdowns

Breakdown can be sub-divided into four categories namely the mechanical breakdown, electrical aspects, bar material and die. Mechanical breakdown involves breakdown of machines in terms of its functionality. As for electrical breakdown involves electrical aspects such as wiring, loose connections, lightings, etc. Breakdown that falls under the category of die could be due to adjustment or setting of tools.

Identification of critical type of breakdown

The machine downtime is further separated by categories of breakdown and is plotted in the form of Pareto analysis. These Pareto analyses are for the month of, February 2001, and March 2001 respectively (Figures 4 and 5). Pareto analysis shows the downtime in a decreasing order thus focusing on the major contributors to the problems.

Figure 4: Pareto Analysis For The Month Of February 2001
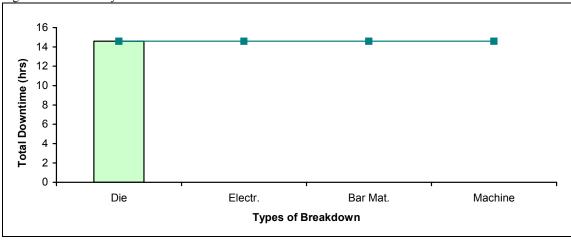
Figure 5: Pareto Analysis For The Month Of March 2001

From the Pareto analysis, it is found that the breakdown of die has the highest machine downtime for almost all six months.

Causes of Problems

One of the major contributors to the breakdown of die is caused by the variation of parts. Raw materials received at Line C mostly come from the roll-forming line initially. This is where all the trouble begins. Parts that are out of specification (over spec) will undoubtedly affect dies, since they have to be set according to the cross-section of parts. If the parts produced (at the roll forming line) are not according to the specification given, dies at Line C are forced to be set according to that 'out-of-spec' part in order to reduce waste at the roll forming line. Apparently, adjustment of die takes too much time and therefore explains the high downtime.

Another main factor that is becoming a predicament to IESB is manpower. Due to technical as well as disciplinary problems, many of the operators were not loyal to the company. New operators often had to be recruited since many have left. As a result, these new operators will have to be trained all over again being inexperienced and not familiar with the company. Since no standards were prepared as yet as to how to set the dies, which all rely on experience and past history, new operators will have trouble with the setting of die as they are still unaccustomed with the machines and processes. This would possibly (maybe definitely) create problems due to errors while setting up dies, handling and servicing them.

Being careless of course can never be eliminated for it is rather a common human behaviour. Apart from proper training and standards for die setting, only through experience and practice can these problems be solved. Moreover, another excuse given at an interview session with a technician from the maintenance department, it was claimed that there is insufficient number of manpower within the department. Hence, the monthly inspection of machines could not be carried out 100% as the responsible person in charge has got other major tasks to attend to.
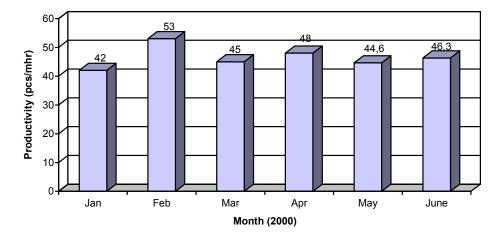
What was observed while this case study was carried out was that some of the check sheets prepared as part of IESB's preventive maintenance procedures were not properly done and followed. The daily inspection sheet for example, should be filled in everyday. Unfortunately, there were a few 'holes' here and there whereby operators were not consistent in carrying out these basic inspection tasks. Furthermore, to make it even worse, a few of these check sheets were not checked or audited by the supervisors. The reason given was not enough manpower and there are other more important tasks to be taken cared for.

Components of dies are known to be very sensitive in the sense that they have their own life span. Normally, the life span of a component in a die is approximately six months to a year. As some of the components (i.e. for the injection mould) were not equipped with spare parts, it would take a long time to repair and amend it if it is broken. Besides that, if the setting is done incorrectly, which is of course again due to human weakness, these components are easily damaged. Operators were either inexperienced or focusing too much on achieving the targeted value of production in order to increase productivity.

Productivity at Line C

Productivity is normally measured by identifying how many pieces an operator is able to produce in an hour. The management of IESB had fixed their production target to be at 44.0 pieces/man hour (pcs/mhr) for the year 2001.

Figure 6: Productivity At Line C For The Year 2001
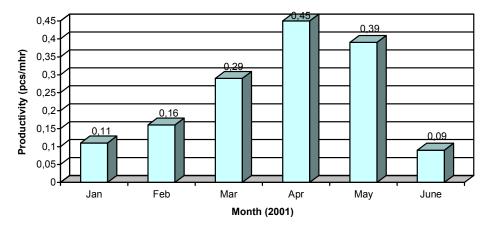
From the graph illustrated in Figure 6, evidently production at IESB, particularly at Line C, was above the target, except in January where it was 42 pieces/man hour. The graph shows an encouraging trend although it does not increase according to the months. It can be said that IESB is able to maintain its productivity, thereby satisfying customer needs, although improvements can be made at some areas.

Production Quality at Line C

Quality can be measured in various types of forms. The number of defects (rejects) strongly reflects the actual production capability. Figure 7 below shows the trend in the number of rejects at Line C for the year 2001.

Figure 7 Productivity At Line C For The Year 2001

The percentage of reject rate is obtained by dividing the total number of rejects to the total production quantity. The targeted value of reject rate for the year 2001 was quantified at 15%. Again, the graph fluctuates and number of rejects is still very high; only January and June showed a value of below target that is 11% and 9% respectively. Rejects observed were mainly scratches and deforms on the product, which was caused by mishandling and mis-setting of dies. IESB had minimise their WIP and provide more training to overcome this problem.

An Autonomous Maintenance Program

Autonomous maintenance program is one of the five pillars. Basically, autonomous maintenance program is a maintenance job that performed by equipment operators. The essence of autonomous maintenance is deterioration prevention, which involves operating equipment correctly, maintaining basic equipment conditions, making adequate adjustments, accurately recording data on breakdowns and malfunctions, and collaborating with maintenance personnel.

There 7 steps of autonomous maintenance program that have been implemented in IESB.

i.   Conduct initial cleaning and inspection
ii.   Eliminate sources of contamination and inaccessible areas countermeasures for the causes and effects of dirt and dust
iii. Develop and test provisional cleaning, inspection, and lubrication standards
iv.   Conduct general inspection training and develop inspection procedures
v.   Conduct general inspections autonomously
vi.   Organise and manage the work place
vii. Ongoing autonomous maintenance and advanced improvement activities

a. Conduct initial cleaning and inspection

This first step is established to ensure that operators develop an interest in and concern for their machines through frequent contact. Initial cleaning and inspection is a part of preventive maintenance. In any plant or work place, cleaning will reveal numerous abnormalities, which can lead to major breakdowns or other losses if not detected early enough. Therefore, cleaning should be the part of an ongoing production activity that will result in better machine performance. The operators carry out the general cleaning and inspection of each machine at Line C at the beginning of each working day. A check sheet called the Daily Preventive Maintenance Check Sheet for each machine is prepared as part of the procedures. The daily checks carried out by the operators are part of the structured maintenance program. By carrying out these checks, a responsibility orientation, quality consciousness, and self-discipline are expected to develop. Other basic objectives of these procedures are to the followings:
• Encourage ownership of the machines by the production operators by carrying out some of the maintenance functions
• Observe the critical components for abnormalities
• Remove the accumulated dust from the machines
• Adjust the cutting tools and jigs and fixtures before the production starts
• Develop discipline among the operators by following systematic procedures
• Ensure that the process conditions and parameters are within the specified limits

Each machine in Line C, namely the Metal Saw Cutting machine, the Press machine and the Injection machine, has its own Daily Check Sheet placed onto it. Early morning, before the production starts, operators will follow the instructions on the check sheet and investigate for any abnormalities and then record it into the respected sheets At the end of the month, this check sheet will be checked by the fitters from the maintenance department and later audited by the supervisors. The visual checks of flow levels and monitoring of process conditions for all three types of machines helps the production team to achieve good process parameters and thus maintains product quality. This includes observing the oil level of lubricating systems, checking for any leakage at the hose or cylinder of the hydraulic tank, monitoring conditions such as the air pressure, physical condition of machine regulators or motors, functionality of emergency push buttons and sensors as well as other inspection guidelines.

The daily lubrication procedures are needed for smooth function of machine components. The most suitable persons to perform these tasks are undoubtedly the production operators because they stay with the machine all the time. This will also help to transfer some of the traditional maintenance functions to the production itself. Jeffrey (1991) explains that the purpose of lubrication is to reduce the friction between two contacting surfaces in relative motion by introducing a lubricant between the surfaces.It is important to note that when realising the dirtiness of any equipment, the source of contamination should be looked for. So far, in Line C, IESB have not yet taken this matter into consideration. This is especially essential to prevent from having to do further unnecessary cleaning and to avoid future contamination.

b. Eliminate sources of contamination and inaccessible areas

Cleaning and inspection can be made a lot easier if the sources of contamination be determined and controlled. At Line C, machines are placed in such a way that all parts of the machines are accessible. They are not installed too close to each other as well as to the floor. This way, cleaning is made with less effort, without having to move equipment or parts when trying to remove dust or dirt on them. Similarly, to check the oil levels, readings on meters, and other parameters are easily done by the operators as they can all be seen clearly on the machines; no areas hidden. For example, when the oil level in the hydraulic tank is below minimum, operators will just have to top it up very easily since the locations of level indicators are just behind each machine. Every team in all lines are responsible for their work place, i.e. for cleaning and improving their own work area. To ensure that they do so, each week, a quality personnel will go around to assess and evaluate the cleanliness of each line. Teams with the highest mark will be announced as the winner and awarded in the form of certification and monetary.

Nevertheless, to check and clean parts that are inaccessible, especially inside the equipment, operators are not yet fully trusted to do this task. For this reason, the maintenance personnel for inspection purposes dismantle all machines once in a month. As part of a scheduled maintenance program, a Monthly Preventive Maintenance Check Sheet is prepared. Considered to be major tasks, these tasks involve checking the pneumatic system, hydraulic system, drive motors, bolts and nuts, and the lubricating system of the machines in detail. Production is stopped when these tasks are carried out and can only be performed by the more experienced people (other than operators). Their policy in this matter is clearly stated in each check sheet, which is "trouble prevention is better than repair". In addition, a yellow coloured paper is glued to each machine as a reminder of the next maintenance activity that needs to be done. This will ensure that no machines are missed and that maintenance activity is carried out according to plan.

c. Develop cleaning and lubrication standards

As to date, IESB have not yet developed any cleaning or lubrication standards. Normally in this step, teams must decide which parts of the equipment need cleaning and how often, which methods to use, what to inspect while cleaning, how to judge whether conditions are normal, etc. These standards, which are developed through experiences, are intended to help the operators do their cleaning tasks with greater confidence and ability. What they have currently is just the standards for the type of lubricant used in each machine as well as the height of die for each part number. The machine maker however, produces these standards. Operators only have to follow what is stated in these standards and make changes wherever possible that substitutes the type of oil allowed. Periodically, operators carry out basic inspection and lubrication according to the daily checklist. They have not yet gone into every aspect of improving the lubrication system, such as having to measure the lubricant consumption rate, review the disposal method for used lubricant, establish a service station, or other improvements concerning lubrication system.

d. Conduct general inspection training

Steps (a) through (c) are carried out to prevent deterioration and control the basic conditions of equipment maintenance - cleaning, lubricating and bolting. In stage (d), operators are trained and provided with ample knowledge by the supervisors or team leaders in order for them to understand their equipment at their work place. This step is an attempt to measure deterioration with a general inspection of equipment. A company's workforce is a priceless asset and these employees have to be properly trained. Basically, new comers at IESB will undergo an induction training where trainers will provide them with fundamental knowledge about the company as well as safety procedures that needs to be followed while working at the shop floor.

Operators at IESB will go through an On Job Training before they are placed in a team at a specific line. Here, operators are primarily trained to understand the processes involved in the production of a part, i.e. beltline moulding. They will be introduced to the machines required to produce a specific part. At the end of each session of an On Job Training, a team leader will evaluate the operator's skills and knowledge according to the lists in the training material prepared. Interestingly, these operators are distributed to other lines throughout the factory. This approach is intended to develop a multiple skill human resource and to reduce any possible significant loss to the business at the same time.. Operators will also have the opportunity to learn about other processes, other types of machine mechanisms, and new skills to be adopted.

IESB also have designed a maintenance training program aimed at all above the senior operators level; since they have work experience of more than five years at IESB. This program, called the Production Personnel Skill Enhancement Program, was constructed (by a senior supervisor) with the intention to achieve the following objectives:
- To equip line leaders and supervisors with knowledge of basic maintenance, die adjustments and parameter setting
- To produce more personnel who could handle problems with regard to machines in each line and for them to be more independent in the future
- To evaluate the skill upon completion of the training program and brief the management on the outcome

No training on general inspection has been provided to the operators at IESB, so far. The lower levels of operators basically inspect machines just by referring to the Daily Preventive Maintenance Check Sheet as mentioned earlier. As for new comers, team leaders will brief them during the everyday morning briefing.

e. Conduct general inspections autonomously

This fifth step compares and re-evaluates the cleaning and lubricating standards established in Steps 1 through 3 and the tentative inspection standards to eliminate any inconsistencies and to make sure the maintenance activities fit within the established time frames and goals. An overall inspection process is formalised by combining the provisional standards created in step 3 with the additional check items for routine general inspection. This stage was formed with the purpose to prevent breakdowns from happening again in the future as well as to detect any inspection points that can be performed by operators themselves whenever breakdown occurs. These points should then be incorporated into the standards developed in step (c).

Since there were no standards developed in Line C at IESB as yet, this fifth step could not be conducted thoroughly. Nevertheless, regular maintenance is still performed according to schedule. Upon discovery of breakdown, the operators recorded into Daily Downtime Monitoring sheet. Downtime is divided into two categories i.e. internal downtime and external downtime. Internal downtime consists of the time when machine or equipment is idle, as for external downtime is the time when other outside activities are carried out that needs the production to stop. These data are recorded according to car parts and done at the end of a working day. After three months, downtime data are gathered and recorded into the Predictive Maintenance Analysis sheet. Clearly, breakdowns or defects are almost impossible to be eliminated; therefore to avoid them from reoccurring is necessary. Data are then analysed based on the statistics calculated. Problems are identified and counter-measured. Hence, recommendations will be made through deep discussions among team leaders, supervisors and managers.

f. Organise and manage the work place

There is an interaction between human senses and his surroundings. Productivity is related to the morale of people working for an organisation (Clements-Croome, 2000). In step 6, other aspects of work environment are considered in order to expand shop floor team activity beyond the equipment itself. Clutter and unnecessary items around the work are eliminated at this point of stage. Workstations at IESB, particularly looking at Line C, are organised in such a manner that emphasises on work effectiveness and safe environment. The location of machines, die racks, work in progress, raw materials, dies, jigs, tools, etc. are all designed with ergonomic elements; they are easily handled and accessed by the operators. The positions of equipment are arranged systematically so that enough space is allocated for operators to do their jobs

The yellow lines show the boundaries of equipment being placed. Machines, trolleys, or racks are positioned within these lines to ensure that everything is organised. Operators will have no trouble when looking for things and to manage the whole operation. Hence, this will save time and automatically increase productivity. An SOP, Standard of Procedures for each type of part produced is attached to every machine for operators' reference. In these Work Instructions, processes of making the product are illustrated and explained step by step in detail. It is intended to avoid from unwanted mistakes and errors. IESB have also adopted the Andon System, whereby in each line, four emergency lights (red, yellow, blue and green) to indicate problems are installed These emergency lights, complete with sound alarms, are switched on by the operators whenever problems in the line exist. Fitters or technicians will immediately attend to the problem after the emergency alarm is realised.

g. Ongoing autonomous maintenance and advanced improvement activities

At this stage, operators are expected to continue to refine the inspection process and to generate improvements that increase equipment life and effectiveness in co-operation with the maintenance department. They will have to become more involved with maintenance and ultimately become independent, skilled, and confident workers who can be expected to monitor their own work and implement improvements autonomously. IESB is still behind from achieving the objectives of this step since there are many elements in each of the seven steps lacking. Yet, a number of improvement activities are continuously implemented to create an ongoing autonomous management atmosphere.

CONCLUSIONS AND RECOMMENDATION

What had been discovered through this case study was that IESB had the basic system towards implementing TPM i.e. preventive maintenance, schedules, etc. Not only that, being internationally certified what with the ISO 9002/QS 9000 standards being applied to the production system, IESB is considered to be on the stepping stones towards TPM success. Disappointing results were observed could possibly be due to the fact that TPM itself was

still new in IESB. It is only at the stage of preparation, whereby only fundamental training as well as introductory campaign was carried out at present. Perhaps, promising results could be seen later in the future, provided that their system conforms to the TPM elements and procedures.

Focusing into autonomous maintenance, it was found that quite a number of elements are still missing in each of the seven steps of autonomous maintenance implementation. Each stage in the implementation of autonomous maintenance emphasises different developmental activities and goals, and each builds upon thorough understanding and practice of the previous step. Therefore, it is essential for every element in each step being implemented before going to the next. Since IESB is still lacking those elements, therefore autonomous maintenance could not be carried out thoroughly indeed, which explains the high downtime and reject rates. Most of the maintenance activities at IESB were carried out according to past experiences, without complying with any standards. No standards on maintenance tasks were developed as yet. This is a problem because once the experienced person is suddenly unavailable; no one can be depended on to fix the machine problem. It shows how much IESB depends on skilful workers, rather than the operators themselves. Hence, so much time is wasted; high downtime. One of the causes of high downtime was the improper management of maintenance. This is evidently shown when a few documents (check sheets) were not updated; not filled in and checked. Obviously, operators and supervisors are still not taking this matter very seriously.

Recommendations

To begin applying TPM concepts to plant maintenance activities, the entire work force must first be convinced that upper level management is committed to the program. The first step in this effort is to either hire or appoint an experienced TPM co-ordinator. It is the responsibility of the co-ordinator to sell the TPM concepts to the work force through an educational program. To educate and convince the work force will undoubtedly take some time, a year or so.

The TPM master plan designed by IESB executive levels was not being carried out according to the schedule. It is recommended that a full time person be assigned into making sure everything takes place as planned. Also, this would overcome the problem whereby workers do not have enough time to attend to these tasks. Many companies have failed when it was decided to split the time of a worker who is already in charge of some other assignments. Lean philosophies require continual dedication and training, which could be provided through knowledge sharing, starting with this particular person.

Responsibilities of this appointed person in charge would include checking, mastering a TPM plan, distribute knowledge to others as well as to operate and sustain all TPM activities. He would also be responsible in ensuring that each stage of the autonomous maintenance implementation steps be fully adopted before continuing to the next step. Teams in a line should be encouraged to start on small problems and keep meticulous records of their progress. For example, since the Injection machine at Line C was seen to be contributing a major impact on the downtime, this machine could be selected as a problem area. The machine is then studied and evaluated in extreme detail by the team, in terms of production rate per machine, breakdown, rejects, etc.

Standards were seen to be one of the crucial factors affecting autonomous maintenance implementation. Maintenance personnel at Line C have not yet developed standards, although basic standards provided by machine makers were displayed at this line. What should have been done was the operators themselves design standards. This standard should regularly be reviewed, and any improvements that were done or could be done are incorporated in these standards. All in all, it is important to realise that TPM does not take an overnight to be implemented. Therefore, it should be carried out step by step, gradually, and focusing into every aspect and detail of its elements and procedures. TPM systems need to be reviewed consistently, modifying and improve wherever necessary. Training should also be provided more intensively for it is the key to being successful in TPM.

ACKNOWLEDGEMENTS

REFERENCES

Al-Hassan, K., Fat-Lam Chan, J., Metcalfe, A.V., 2000, "*The role of total productive maintenance in business excellence*", Total Quality Management, 11, 4/6, 596-602.

Bakerjan, R., 1994, Tool and Manufacturing Engineers Handbook, 7, "*Continuous Improvement*", 4th ed., ASME Publication, USA.

Bamber, C.J., Sharp, J.M., and Hides, M. T., (1999). Factors affecting successful implementation of total productive maintenance: A UK manufacturing case study perspective. Journal of Quality in Maintenance Engineering, vol. 5, no. 3. pp. 162-181.

Besterfield, D. H., Besterfield-Michna, C., Besterfield, G. H., and Besterfield-Sacre, M. (2003). Total Quality Management. 3rd Edition, New Jersey:Prentice Hall

Bohoris, G.A., Vamvalis, C., Tracey, W., Ignatiadou, K., 1995, "*TPM implementation in Land-Rover with assistance of a CMMS*", Journal of Quality in Maintenance Engineering, 1, 4.

Bohoris, G.A. Vamvalis, C. , Trace, W. . Ignatiadou, K. (1995). Journal of Quality in Maintenance Engineering Volume 01 Number 4 1995 pp. 3-16

Cooke, F.L. (2003). Plant maintenance strategy: evidence from four British manufacturing firms, Journal of Quality in Maintenance Engineering Volume 9 Number 3 2003 pp. 239-249

Davis, R., 1997, "*Making TPM a part of factory life*", TPM Experience (Project EU 1190, Sponsored by the DTI), Findlay.

Hartmann, E.H. (1992): Are You Serious About Succeeding with TPM, Proc. 9th International Maintenance Conf., Institute of Industrial Engineers, Nashville, TN, pp. 212-243.

Maggard, Bill N. (1992): TPM That Works, TPM Press Inc., Pittsburgh, Pennsylvania.

Maggard, Bill N. (1989): Total Productive Maintenance That Works, Proc. IEEE/CHMT '89 European International Manufacturing Technology Symposium, pp. 13-17

Maskell, B. H., 1994, New Performance Measures, Productivity Press, Cambridge, MA.

McCarthy, D., 1997, "*To benefit, change the way you manage*", TPM Experience (Project EU 1190, Sponsored by the DTI), Findlay, UK.

McKone, Kathleen E. et. al. (1999): Total Productive Maintenance: A Contextual View, Journal of Operations Management, pp. 123-144.

Nakajima S. (1984): Introduction to TPM, Productivity Press, Portland, Oregon.

Nakajima, S., 1988, TPM: Introduction to Total Productive Maintenance, Productivity Press Inc

Prickett, P.W. (1999): An Integrated Approach to Autonomous Maintenance Management, Integrated Manufacturing Systems, pp. 233-242.

Productivity Press Development Team (1992): TPM for Supervisors, Productivity Press, Portland, Oregon.

Rhyne D. (1989): Synopsis of Total Productive Maintenance, Proceedings of Eastern Manufacturing Technical Show, West Springfield, MA, pp. 214-217.

Shirose, K. (1995): TPM Team Guide, Production Press, Portland, Oregon.

Shirose, K., 1992, TPM for Workshop Leaders, Productivity Press, Cambridge, MA.

Spenley, P., 1992, World Class Performance Through Total Quality, Chapman and Hall, London

Takahashi, Y. & Osada, T. (1990): Total Productive Maintenance, Asian Productivity Organisation, Japan

Takahashi, Y., (1981) "*Maintenance-oriented management via total participation*", Terotechnica, 2, pp 79-88

Tenner, A.R., DeToro, I.J., 1992, Total Quality Management: Three Steps to Continuous Improvement, Addison-Wesley Publishing Co, Reading, MA

Willmott, P., 1997, TPM: Total Productive Maintenance: The Western Way, Butterworth-Heinemann, Oxford.

Willmott, P. (1994): TPM – The Western Way, Butterworth Heinemann.

Windle. W.W., 1993, "*TPM: more alphabet soup or a useful plant improvement concept*", Plant Engineering, 47.2, 62-3.

Van Der Wal, R. W.E., and Lynn, D. (2002) Total productive maintenance in a South African pulp and paper company: a case study, The TQM Magazine Volume 14 Number 6 2002 pp 359-366

Yeomans, M., Millington, P., 1997, "*Getting maintenance into TPM*", Manufacturing Engineer, 170

Evaluation of Training Program on ' Long- Term Training Program of the Japanese Language' at Japanese Language Institute, Urawa, Japan

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ABSTRACT

This study is an evaluation of training program entitled *'Long- Term Training Program of The Japanese Language'* at the Japanese Language Institute, Urawa, Japan from 6 March 2002 to 23 August 2002. In this study, all 35 participants are from Asia Pacific countries, Latin Amerika and Africa who are to become Japanese teachers in the future. The participants have basic written and spoken skills in Japanese Language. All of the participants own the qualification of Japanese Overseas Proficiency Test Level 3. There are four level in Japanese Overseas Proficiency Test, there are Level 4, Level 3, Level 2 and Level 1. Level 4 is the most basic level and Level 1 is the highest level.

INTRODUCTION

Evaluation of the training program has grown in priority over the last decade. However, most organisations' evaluation activity is relatively unsophisticated. The most popular (Kirkpatrick) model has been around since the late 1950s. The most useable evaluation syatem for this task is based on a four- level systems designed by Donald Kirkpatrik. This system is used for a variety of relevant educational program.

Kirkpatrik Model

Kirkpatrik Model is a model to evaluate a training program. These four-level model of evaluation that has become a classic in the industry:

Level One: Reaction

Level Two: Learning

Level Three: Behavior

Level Four: Results

These levels can be applied to technology-based training as well as to more traditional forms of delivery.

Level One: Students' Reaction

In this first level or step, students are asked to evaluate the training after completing the program. For example, the relevance of the objectives, the ability of the course to maintain interest and the amount and appropriateness of interactive exercises.

Level Two: Learning Results

Level Two in the Kirkpatrik model measures learning results. In other words, did the students actually learn the knowledge, skills, and attitudes the program was supposed to teach? To show achievement, have students complete a pre-test and post- test, making sure that tests items or questions are truly written to the learning objectives. By summarizing the scores of all students, trainers can accurately see the impact that the training intervention had.

Level Three: Behavior in the Workplace

Students typically score well on post-tests, but the real question is whether or not any of the new knowledge and skills are retained and transferred back on the job. Observation surveys are used.

Level Four: Business Results

The fourth level in this model is to evaluate the business impact of the training program. Sample training programs and the type of business impact data can be measured. For example, sales training, technical training, quality training, safety training and management training.

An Underlying Model

Kirkpatrick developed his four-step model in 1959 and provided a simple and pragmatic model for helping practitioners think about training programmes. It has been taken as a foundation to evaluate this training program.

OBJECTIVES OF THE STUDY

The study has two main objectives. Base on Kirkpatrick's Model, for evaluating training program, based on:

1. Reactions - What did the learners think of the training?
2. Learning - What did learners learn during the learning experience?

The research did not proceed to Level 3 and Level 4 due to the time limitation. This is because Level 3 and Level 4 can only be evaluated at least 6 months after a program was conducted.

METHODOLOGY

Questionnaires were used as a tool for the data collection. Evaluation was done on reaction level (satisfactory survey)that is Level 1 (Kirkpatrik,1994) and learning level, that is Level 2 (Kirkpatrik, 1994) by pre-test and post test using the same test which the questions do not change.

DISCUSSION OF RESULTS

Part 1: General Personal Details

100% of the respondents were participants of ' *Long- Term Training Program of The Japanese Language*' program at   Japanese Language Institute, Urawa, Japan from 6 March 2002 to 23 August 2002.

Part 2: Evaluation For Level 1: Reaction

The evaluation for Reaction Level was analysed with descriptive methods used to calculate frequencies, percentage, min and standard deviation. In the level of reaction training contents, presentation of the instructor, training environment, training material, training duration and facilities had been evaluated.

Level of satisfaction of the respondents to these aspects has been categorized to four levels.

Table 1: Level Of Satisfaction Of The Respondents For The Aspects Of Program

Level Of Satisfaction	Min Score
Strongly Satisfied	3.0- 4.0
Satisfied	2.0- 2.9
Slightly Satisfied	1.0- 1.9
Not Satisfied	0.0- 0.9

68.6% of the respondents were strongly satisfied with the aspect of training contents.

Most of the respondents were strongly satisfied that the content of the program is well- designed and the program met the objectives of the training similarly. The majority of the respondents were satisfied that the content covered in the program was suitable.

62.9% of the respondents were strongly satisfied with the aspect of presentation of the instructor. Most of the respondents were strongly satisfied that the instructor is an effective communicator and that the technique of delivery was effective. Only **42.9%** of the respondents were strongly satisfied that the instructor was well-prepared.

62.9% of the respondents were strongly satisfied with the aspect of training environment. Most of the respondents were strongly satisfied that there was communication between trainee and instructor. Majority of the respondents were strongly satisfied that there were active discussion sessions in the class.

48.6% of the respondents were satisfied with the aspect of training material. Most of the respondents agreed that the usage of audiovisual materials was not effective. The majority of the respondents agreed that the number of audiovisual aids is enough and the handouts improved their understanding on the subject matter.

48.6% of the respondents were slightly satisfied with the aspect of training duration. **60.0%** of the respondents disagreed with the training duration is suitable. Most of the respondents agreed that hours of learning grammar and comprehensive exercise were not enough.

62.9% of the respondents were slightly satisfied with the aspect of facilities. Most of the respondent were strongly satisfied with the facilities of library, computer lab, canteen, sports and accommodation facilities except there was no variety food in the canteen to cater participants from many countries.

Part 2: Evaluation For Level 2: Learning

The evaluation for Learning Level was analysed with descriptive methods were used to calculate frequencies, percentage, min and standard deviation. In the level of learning, grammar, comprehension and vocabulary aspects has been evaluated.

Learning level was evaluated by pre-test and post test using the same test which the questions in the test do not change. Pre-test was delivered before the participants attend the program and the post test was delivered to the participants after the program that was last for 6 months.

Table2: Level Of Learning Of The Respondents For The Test

Level Of Learning	Total Score
Strongly Satisfied	28 and above
Satisfied	19- 27
Slightly Satisfied	9- 18
Not Satisfied	0- 8

EVALUATION OF LEVEL OF LEARNING FROM THE ASPECT OF GRAMMAR

Pre-test: 54.3% of the respondents were in the category of slightly satisfied.

Post test: 62.9% of the respondents were in the category of strongly satisfied. The difference of min score with 10.02 showing that there is an icrease of level of learning of the respondents from the aspect of grammar.

EVALUATION OF LEVEL OF LEARNING FROM THE ASPECT OF COMPREHENSION

Pre-test: 48.6% of the respondents were at the category of slightly satisfied.

Post test: 77.1% of the respondents were at the category of strongly satisfied. Min score of the post- test, which is 3.06 points higher than pre-test showing that there is an increment in the level of learning from the aspect of comprehension.

EVALUATION OF LEVEL OF LEARNING FROM THE ASPECT OF VOCABULARY

Pre-test: 34.3% of the respondents were at the category of satisfied and 5.7% of the respondents were at the category of not satisfied.

Post test: 77.1**%** of the respondents were at the category of strongly satisfied. Min score of the post- test, which is 0.27 points higher than pre-test showing that there is an increment of level of learning from the aspect of vocabulary.

EVALUATION OF LEVEL OF LEARNING GENERALLY

Pre-test: 37.1% of the respondents were at the category of satisfied and 28.6% of the respondents were at the category of strongly satisfied.

Post test: 31.4**%** of the respondents were at the category of satisfied and 82.9% of the respondents were at the category of strongly satisfied. Min score of the post- test, which is 10.03 points higher than pre-test showing that generally, there is an increment of level of learning.

SUGGESTIONS FROM THE RESPONDENTS FOR THE ORGANIZATION

Longer learning time for Japanese Language study everyday.

This is because learning time for Japanese Language could be extended and more issues on Japanese Language could be discussed.

Longer learning time for listening session for this syllabus.

The listening session should be extended to learn more on intonation of native Japanese speaking.

To reduce the homework.

Respondents suggested to reduce homework and have more time to observe the real culture and way of living of Japanese people.

To add video viewing curriculum during Japanese learning session in the class.

Respondents suggested to add video viewing curriculum during Japanese learning session in the class to increase comprehension respondents through listening and watching the video.

To extend the visiting activity for learning purpose.

To hold discussion sessions at the end of every lecture.

To hold counselling sessions for respondents.

To design a training program that is more than six months.

SUGGESTIONS FROM THE RESPONDENTS FOR THE OTHERS RESEARCHER

To evaluate training program with other methods too, for example, interview.

This research could be done in other Japanese Language Study Institutions to get an overview of the training program of Japanese Language Study in Japan.

Use control group to compare the outcome with the outcome without using control group to get a more comprehensive outcome.

CONCLUSION

Training evaluation is a bit like eating five portions of fruit and vegetables a day; everyone knows that they are supposed to do it, everyone says they are planning to do better in the future and few people admit to having got it right. Much of that money is wasted because many trainers don't know the appropriate steps to take to ensure that their training addresses a real need. In conclusion, evaluation of program can tell us how relevant participants thought the training was and to check to see whether participants can perform according to the program objectives. In short, evaluation of a program is a must to develop a program to achieve the organization's objectives.

Export Market Diversification:
Evidence Prior To The 1997 Economic Crisis

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ABSTRACT

This paper reports the findings of a study on discriminating exporters vs non-exporters to new export market. The analysis involved organizational and marketing variables. The data used in this paper was derived from a larger study, which investigated the Malaysian manufacturing firms export behavior. The respondents are members of the Federation of Malaysian Manufacturers. The discriminant analysis revealed that three variables distinctively separate the two groups of firms - total number of export market, external support, and use of trading companies. The discriminant loadings of the three variables shows that the use of trading companies and the importance of external exporters carries a negative sign whereas total number of countries exporting to carried a positive sign. This indicates that the exporters to new markets appear to be associated with the policy of market spreading and those that prefer to remain and service their current export market are more dependent on indirect channels and support provided by public and private bodies in facilitating the export business.

INTRODUCTION

The manufacturing sector's share of Gross Domestic Product (GDP) rose from 27.1 percent in 1995 to 33.4 percent in 2000. The manufacturing sector is targeted to grow 8.9 percent per annum from 2001 to 2005, contributing 35.8 percent of Gross Domestic Product (GDP) by 2005. One of the thrusts of the 8th Malaysian Plan is to position industries for globalization. New initiatives in export promotion are being planned. The importance of exploring into new export promotion are being planned. The importance of exploring into the new export markets have been stressed in the nation's export-led development policy. The question is, "will Malaysian firms venture in new export market?"

The export of manufactured goods accounted for 85.2 percent of total gross exports last year compared with 79.6 percent in 1995. The main contributor to growth in electronic goods exports was the electrical and electronic product, accounting for 72.5 percent of total manufactured exports in 2000. Employment in the manufacturing sector grew by 4.8 percent annually, accounting for 41.7 percent or 530,800 of the new jobs created between 1996 and 2000.

Despite the above encouraging information on the significance of manufactured products export, the situation on export destinations is rather dismal. There have not been much changes in the direction of trades. Asean countries, particularly Singapore, USA, Japan and EU continue to be Malaysia's major importers of manufactured products, accounting for more than two-thirds of the total export volume. Refer Table 1.

Table 1: Major Export Destinations for Manufactured Products

Nations	Year		
	1990	1995	2000
ASEAN (%)	27.5	27.8	26.6
USA (%)	25	24.9	24.2
Japan (%)	8.1	10.3	11.3
EU (%)	17.6	14.8	15.4
South Countries (%)	-	12.8	14.9
Rest of the world (%)	14.6	9.4	7.6
Total RM (billion)	RM. 46.8	RM. 147.3	RM. 317.9

This paper intends to explore factors associated with a firm's initiative to venture into new export markets. A review of export literature is presented in the next section and this will be followed by information on the sources of data and the results of statistical analysis.

LITERATURE REVIEW

Observations of firm behavior have led to the emergence of the behavioral school which propounded the idea that managers/decision makers operate under conditions of uncertainty and are heavily influenced by subjective and perceptual factors (Baumol, 1967; Williamson, 1964; Cyert and March, 1963). Decision-makers are more likely to follow the incremental decision-making mode rather rational-comprehensive method, have great influence on subsequent strands of research. A typical strand of research that can be identified is in the studies of firms' export behavior. Bilkey (1978) integrative review of the export literature highlights the interaction of the three major factors in the firm's export initiation – the importance of decision-maker, the characteristics of the firm, and the external forces impinging upon the firm's operations.

Another stream of research that emerged is the categorization of exporters based on their approach to exploiting opportunities in export markets. Piercy (1981) and Bodur (1994) differentiated them into aggressive and reactive exporters. Whereas Tesar and Tarleton (1982), da Rocha et. al. (1990) categorized the exporters into aggressive and passive; Ganitsky (1989) described the exporters as innate and adoptive; Bourantas and Halikias (1991) used the term systematic and non-systematic exporters. These distinction reflect the difference between strategic behaviors and the allocation of resources and marketing activities. The active, aggressive, innate and systematic exporters have been established to exhibit a strong market orientation, higher management commitment to export, have greater marketing advantage compared to their counterparts.

The proliferation of studies in exporting and factors associated with export performance have spurred other researchers to synthesize the literature (Cavusgil and Nevin, 1981; Kaynak and Kothari, 1984; Miesenbock, 1987; Madsen, 1987; Aaby and Slater, 1989; Ford and Leoniduo, 1991; Andersen, 1993; Leoniduo and Katsikas, 1996; Zou and Stan, 1998; Katsikeas, Leoniduo and Morgan, 2000). From a research standpoint, the methodological issues and shortcomings of existing studies were highlighted. Nevertheless these studies have made positive contribution to policy makers in designing export development programs. The practitioners on the other hand were alerted to factors that may inhibit or stimulate their export expansion programs.

This paper hopes to add to existing knowledge in export behavior by focusing on current exporters inclination to venture into new export markets. This issue is relevant in the context of Malaysia as she is aggressively encouraging firms to look for new export markets. The manufacturers have been frequently advised to venture beyond the nation's traditional trading partners.

PURPOSE

Exports of manufactured products play a strategic role in Malaysia's economic development. It is Malaysia's national policy to encourage exporters to venture to abroad. This paper examine the characteristics of Malaysian manufacturing firms that have ventured into new markets vis-à-vis non-exporter to new markets.

METHODOLOGY

The data used in this paper was derived from a larger study which investigates Malaysian manufacturing firms export behavior (Osman, 1994). The respondents are members of the Federation of Malaysian Manufacturers (FMM) as listed in the 1992 membership directory. Based on the response to the question on whether they have entered the new export market during the last three years, it was established that 105 firms have ventured into new export markets and the remaining 85 did not do so. The new export markets mentioned by the former group are presented in Table 2.

Table 2: New Export Markets

Country	Total	
	Number	Percent
ASEAN countries	13	6.80
Far East	28	14.74
South Asia	7	3.68
West Asia	5	2.63
Europe	19	10
North America	5	2.63
South America	4	2.11
Australia	6	3.16
Africa	2	1.05
Did not identify the new export markets	22	11.58
Did Not Enter New Market	85	44.74
Total	190	103.12

The data was subjected to factor and reliability analysis. Subsequently discriminant analysis was performed to determine if the two groups of exporters are different with respect to organizational characteristics (refer Table 3); the degree of importance they attached to a number items reflecting marketing-mixes, types of information considered important for export decisions as well as the export channels.

Table 3: Organizational Characteristics

	Frequency	Percentage
Industry Category		
Food and Beverages	16	8.4
Textile and Apparels	10	5.3
Wood and Wood Products	22	11.6
Chemical and Chemical Products	62	32.6
Non-Metallic and Mineral Products	20	10.5
Manufacturers of Metal	26	13.7
Electronic and Electrical Products	17	8.9
Other Manufacturers	17	8.9
Size (Number of Employees)		
75 or less	38	20.1
76 – 250	79	41.8
251 and above	72	38.1
Years Established		
1 – 5 years	27	14.2
6 – 10 years	41	21.6
11 – 15 years	34	17.9
16 – 2- years	38	20.0
More than 20 years	50	26.3
Years began exporting		
1 – 5 years	67	35.3
6 – 10 years	63	33.2
11 – 15 years	22	11.8
16 – 2- years	21	11.1
More than 20 years	17	8.9

Percentage of Foreign Equity		
0 %	84	44.2
1 – 30 %	10	5.3
31 – 50 %	41	21.5
51 % and above	55	29.0
Type of product		
Consumer	71	38.2
Industrial	66	35.5
Mixed (Consumer & Industrial)	49	26.3

THE FINDINGS

The Results of Factor and Reliability Analysis

The principal component factor analysis with Varimax rotation was employed to test the dimensionality of the 34 items describing marketing competencies. Using an eigenvalue of one or greater as the criterion, along side the scree test, an eight factor solution emerged.

Table 4: Results of Factor and Reliability Analysis – Marketing Variables

Variables	Factor Loading	Variance %	Eigen-value	Cronbach alpha	Mean
Factor 1: Product Modifications					
size of packaging	.763	11.02	3.75	0.86	2.75
branding/labelling	.788				
color of packaging	.808				
packaging materials	.797				
raw materials used	.601				
style/design/other features	.746				
Factor 2: Promotional Efforts					
Trade fairs and exhibition	.693	10.69	3.63	0.85	2.19
Trade mission	.800				
Advertising in trade journals Matrade	.670				
exhibition center	.790				
Trade Commissioners Service	.761				
Trade associations promotional programs					
	.670				
Factor 3: Distribution Strategy					
Selection & performance policy	.663	10.21	3.47	0.86	3.17
Solicit market information	.817				
Marketing networks overseas	.797				
Dealing with bureaucracy	.727				
Expeditious payment	.759				
Factor 4: Total Quality Marketing Management					
Commitment to quality improvement program	.663	9.94	3.38	0.82	4.41
Coordination between marketing, production & finance functions	.591				
Clearly defined target market Consistent	.482				
product quality	.787				
High product quality	.826				

	Factor Loading	Variance %	Eigen-value	Cronbach alpha	Mean
Factor 5: Pricing Strategy					
Price competitiveness	.794	6.64	2.26	0.72	3.74
Low production cost	.685				
Relative Value of Malaysian Currency	.546				
Factor 6: External Support					
Relations with suppliers	.481	6.44	2.19	0.70	3.38
Bankers support	.769				
Export Credit Refinancing Scheme	.757				
Factor 7: Relationship Marketing					
Understanding of international business culture	.515	5.45	1.85	0.62	3.21
Joint efforts with distributors	.612				
Regular visits to overseas market	.795				
Factor 8: Marketing Orientation					
Emphasis on profits	.795	4.03	1.37	0.46	3.06
Product uniqueness	.627				

As shown in Table 4, the model explained 64.2 percent of the total variance and was distinguished by strong individual loadings on each factor, thereby enabling conceptual interpretation. The seven marketing competencies dimensions, in order of variance explained, have been labelled as follows: Product Modifications, Promotional Efforts, Distribution Strategy, Total Quality Marketing Management, Pricing Strategy, External Support, Relationship Marketing, and Marketing Orientation. The cronbach alpha coefficient was used to evaluate their reliability and the results exhibited acceptable reliability.

As regards to the 10 items describing information types considered importance for export decisions, the factor analysis yielded a 3 factor solution explaining 63.2% of the variance. (see Table 5) The reliability also showed acceptable levels for all three variables thus all three will be retained for further analysis.

Table 5: Results of Factor and Reliability Analysis – Information Types

Variables	Factor Loading	Variance %	Eigen-value	Cronbach alpha	Mean
Factor 1: Information on market demand	0.770	25.26	4.06	0.68	3.87
Market Potentials	0.853				
Buyers Preferences					
Factor 2: Information on macro environment	0.855	22.10	2.21	0.74	3.29
Social and Political Development	0.786				
Economic Indicators	0.645				
Rules and Regulations					
Factor 3: Information on competition	0.772	15.83	1.58	0.77	3.37
Level of Competition	0.701				
Distribution Structure	0.764				
Price Trends	0.548				
Export Restrictions	0.624				
Ways to Adapt Product					

The factor analysis on the channels of distribution yielded a three factor solution explaining 69.01% of the variance. The reliability also showed acceptable levels for all three variables thus all three will be retained for further analysis.

Table 6: Results of Factor and Reliability Analysis – Channels of Distribution

Variables	Factor Loading	Variance %	Eigen-value	Cronbach alpha	Mean
Factor 1: Direct Distribution					
Export channels – Distributors in importing nation	0.675	42.57	3.83	0.48	2.77
Export channels – Major retailers in importing nation	0.791				
Export channels – Affiliate companies overseas	0.622				
Factor 2: Trading Companies					
Export channels – Malaysian Trading Companies	0.719	15.25	1.37	0.75	1.95
Export channels – Singaporean Trading Companies	0.772				
Factor 3: Foreign Trading Companies					
Export Channels – Japanese Trading Company based in Malaysia					
Export Channels – European Trading Company based in Malaysia	0.851	11.19	1.01	0.88	1.61
Export Channels – European Trading Company based in Singapore	0.732				
Export Channels – Japanese Trading Company in Malaysia	0.665				
	0.848				

Determining Variables That Discriminate Between Exporters And Non-Exporters To New Markets

A discriminant analysis was conducted to test whether the 19 variables can used to discriminate the exporters and the non-exporters to new markets in the last three years. The sample was divided randomly into two groups based on a 65–35 ratio with the first group as the analysis sample and the second group as the holdout sample. The analysis sample was used for estimation whereas the holdout sample was used for validation.

As shown in Tables 7, 8 and 9, the predictive accuracy of the model for the analysis sample, cross validation and holdout sample of the variables was 70.6%, 58.8% and 65.2% respectively. From the results, it can be concluded that by using the model of organizational and marketing variables, one could classify the respondents according to their exporting status, i.e. exporters or non-exporters to new markets in the last three years.

Table 7: Hit Ratio For Cases Selected In The Analysis

Actual Group	Number of Cases	Predicted Group Membership	
Exported to New Markets in the last 3 years	119	Yes	No
Yes	67	50 (74.6)	17 (25.4)
No	52	18 (34.6)	34 (65.4)

Note: Figures in brackets are percentages. Percentage of "grouped" cases correctly classified: 70.6%

Table 8: Hit Ratio For Cross-validated* Cases

Actual Group	Number of Cases	Predicted Group Membership	
Exported to New	119	Yes	No
Markets in last the 3 years			
Yes	67	43	24
		(64.2)	(35.8)
No	52	25	27
		(48.1)	(51.9)

Note: Figures in brackets are percentages. Percentage of "grouped" cases correctly classified: 58.8%

Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the function derived from all other cases other than the case.

Table 9: Hit Ratio For Cases Not Selected In The Analysis (Holdout)

Actual Group	Number of Cases	Predicted Group Membership	
Exported to New	66	Yes	No
Markets in last the 3 years			
Yes	36	28	8
		(77.8)	(22.2)
No	30	15	15
		(50.00)	(50.00)

Note: Figures in brackets are percentages. Percentage of "grouped" cases correctly classified: 65.2%

To further examine whether the model was good and accurate (overall fit) several methods can be employed, three of the most commonly used tests are maximum and proportional chance criterion and also the Press Q test (Hair et al., 1998) were conducted as shown in Table 10. The hit ratio (holdout sample) exceeded both the maximum chance and proportional chance value. The Press's Q statistic was significant at 0.01. Therefore it can be concluded that the model investigated was good and accurate. With a canonical correlation of 0.505, and by squaring this value, it can be concluded that 25.5% of the variance in the dependent variable can be accounted for by this model. The overall hit ratio also exceeded the proportional chance criterion (50.40%) by the requisite 25% cutoff (exceeded 65%), giving support to the confidence in the predictive validity of the discriminant function and confirming the inferences made based on the univariate results. (Hair et al., 1998). This result further confirmed that the discriminant model is a good and valid model in classifying the two groups of exporters and non-exporters.

Table 11 presents the summary of interpretive measures for the discriminant analysis. To examine the relative discriminating power of each variables, the discriminant loading or also called the structure matrix is observed. As indicated by Grover (1993) these structural correlation are better measures compared to discriminant coefficients. The larger the discriminat loading the higher relationship with the discriminant function. Hair et al. (1998) described that the sign attached to the loadings will show positive or negative relationship with the discriminant function. In this paper, positive signs means it is contributing towards exporting and the negative signs contributing towards non-exporting. The discriminant function has a canonical correlation of 0.505 and is statistically significant with Wilks' Lambda = 0.745, P-value = 0.035. From the discriminant function loading, it can be concluded that total number of countries ($r = 0.543$), external support ($r = -0.393$) and trading companies ($r = -0.279$) were the factors that will help to discriminate exporters and non-exporters.

Table 10: Comparing Goodness of Measure (Holdout Sample)

Measure	Value	Hit Ratio for Holdout Sample
Maximum Chance	54.54 %	65.2 %
Proportional Chance	50.40 %	65.2 %
Comparison with Hair et al. (1998), 25% higher than proportional chance	63.00%	65.2 %
Press Q Table Value		6.635
Calculated Value		30.77**

Note: ** p < 0.01

Table 11: Summary of Interpretive Measures for Discriminant Analysis

Independent Variable	Discriminant Loading	Univariate F Ratio
Total Number of Countries	0.543	11.765**
External support	-0.393	6.176*
Trading companies	-0.279	3.117*
Information of market demand	0.220	1.942
Years Exporting	-0.219	1.912
Foreign trading companies	-0.115	0.529
Product modification	0.110	0.488
Marketing orientation	0.109	0.471
Distribution strategy	0.100	0.399
Years Operation	-0.084	0.283
Total quality marketing management	0.078	0.244
Direct distribution	-0.077	0.235
Information of macro environment	-0.075	0.226
Relationship marketing	0.060	0.146
Capital Foreign	0.051	0.105
Information of Competition	0.046	0.086
Price strategy	0.046	0.085
Promotion strategy	-0.030	0.035
Number of Employees	0.012	0.006
Group Centroid for Exporters	0.511	
Group Centroid for Non Exporters	-0.658	
Wilks Lambda	0.745	
p-value	0.035	
Canonical squared correlation	0.255	

Note: ** $p < 0.01$; * $p < 0.05$

CONCLUSION

The motivation to venture into new export markets can be attributed to a host of variables. The findings of this study show that the total number of countries carries a positive sign, this indicates that that the exporters were more influenced to export to new markets by the number of countries they are exporting to. It appears that a market diversification strategy have a positive impact on firm's readiness to explore and actively search for more new markets. This could also be an indication that the experiential acquired from activities in current markets are pre-requisite to export market expansion. Firms practising concentrated market strategy are deprived of knowledge about possible new markets as they are more focused at servicing a very small number of markets only.

The two variables that carried negative signs are external support and trading companies. It could be inferred that non exporters to new export markets are relying in assistance from outside agencies to finance their export ventures. It could be construed that the unavailability of additional assistance to be a barrier to venture into new markets. The usage of trading companies is likely to inhibit information flows.

The intermediaries sometimes do not readily pass information to exporters. Thus depriving these exporters of opportunities beyond their current markets. It can be concluded that the only way for firms to venture into new markets is to acquire knowledge as proposed by the Uppsala model where firms acquire knowledge through a process of learning from their own experience.

REFERENCES

Aaby, N. E., & Slater, S. F., (1989). Management Influences on Export Performance: A Review of the Empirical Literature, 1978-1988, *International Marketing Review*, Vol. 6, pp. 7-26.

Bilkey, W. (1978). An Attempted Integration of the Literature on the Export Behavior of Firms, *Journal of International Business Studies*, Spring, pp. 33-46.

Bodur, M. (1994). Foreign Market Indicators, Structural Resources and Marketing Strategies as Determinants of Export Performance, in Axinn, C. (ed), *Advances in International Marketing*, Greenwich, CT: JAI Press,

Vol. 6, pp. 183-205.

Bourantas, D., & Halikias, J., (1991). Discriminating Variables Between Systematic and Non-Systematic Exporting Manufacturing Firms in Greece, *Journal of Global Marketing*, Vol. 4, No. 2, pp. 21-37.

da Rocha, A., Christensen, C.H., & Eduardo C., (1990). Aggressive and Passive Exporters: A Study in the Brazilian Furniture Industry, *International Marketing Review,* Vol.7, pp. 6-15.

Cavusgil, S.T., (1984). Organisational Characteristics Associated with Export Activity, *Journal of Management Studies*, Vol. 21, No.1, pp. 3-22.

Cavusgil, S.T., (1994). From the Editor in Chief, *Journal of International Marketing*, Vol. 2, No. 3, pp. 4-6.

Cavusgil, S.T., (1995). From the Editor in Chief, *Journal of International Marketing*, Vol. 2, No. 1, pp. 3-7.

Diamantopoulos, A., & Inglis, K., (1988). Identifying Differences Between High- and Low

-Involvement Exporters, *International Marketing Review,* Summer, 52-60.

Ford, D. et. al. (1987). Managing Export Development Between Industrialised and Developing Countries, in Rosson, P.J., & Reid, S.D. (eds) *Managing Export Entry and Expansion*, New York: Praeger, pp. 71-90.

Ford, D., & Leoniduo, L. (1991). Research Developments in International Marketing: A European Perspective, in Paliwoda, S.J. (ed), *New Perspectives on Marketing*, Routledge: London.

Ganitsky, J. (1989). Strategies for Innate and Adoptive Exporters: Lessons from Israel's Case, *International Marketing Review*, Vol. 6, pp. 50-65.

Koh, A.C., & Robicheaux, R.A., (1988), Variations in Export Performance Due to Differences in Export Marketing Strategy: Implications for Industrial Marketers, *Journal of Business Research*, 17(3), 249-258.

Levy, B. (1988). Korean and Taiwanese Firms as International Competitors: The Challenges Ahead, *Columbia Journal of World Business,* Spring, 43-50.

Madsen, T. K., (1987). Empirical Export Performance Studies: A Review of Conceptualizations and Findings. In Cavusgil, S. T., (Ed.), *Advances in International Maketing,* (pp. 177-98), Vol. 2, Connecticut:JAI Press Inc.

Madsen, T. K., (1989). Successful Export Marketing Management: Some Empirical Evidence, *International Marketing Review*, 6(4), 41-57.

Miesenbock, K. J., (1988). Small Businesses and Exporting: A Literature Review, *International Small Business Journal*, Vol. 6, No. 2, pp. 42-61.

Piercy, N. (1981). Company Internationalization: Active vs Reactive Exporters, *European Journal of Marketing*, Vol. 15, No. 3, pp. 26-40.

Rennie, M.W., (1993). Born Global, *The McKinsey Quaterly*, No. 4, pp. 45-52.

Tesar, G. & Tarleton, J.S., (1982). Comparison of Wisconsin and Virginia Small and Medium-sized Exporters: Aggressive and Passive Exporters, in Czinkota, M., & Tesar, G. (ed), *Export Management: An International Context*, New York: Praeger.

Wortzel, L.H., & Wortzel, H. V., (1987). Export Marketing Strategies for the NIC and LDC-Based Firms, *Columbia Journal of World Business*, Vol. 16, No. 1, Spring, pp. 51-60.

Psychic Distance and Export Performance among Malaysian Firms Exporting to Arabic Speaking Nations

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ABSTRACT

This study examined the perception of psychic distance and its relationship with export performance (Strategic, financial and satisfaction) of the Malaysian firms exporting to Arabic speaking nations. Based on the four dimensions of psychic distance (legal-political, business transaction, product cultural and elements of cultural differences) a classification of high and low perception was done through calculating the median values. The results did not show any significant differences for political-legal, product cultural adaptation and elements of cultural differences. However, the results showed that there is a significant difference on business transaction with the financial performance. The methodological issues and discussion are illustrated.

INTRODUCTION

Within the firm's internationalization process, psychic distance is considered as the outcome of the different individuals cultural background involved in the interaction process. The more different the other person's culture and business practice the greater the degree of psychic distance. Psychic distance has extensively been identified as indicator of foreign market orientation and determinant of export performance. However, the empirical testing of the concept revealed with inconclusive results (Holzmuller & Stottinger, 1996; Holzmuller & Kasper, 1991; Stottinger & Schlegelmilch 1998; Evans & Mavondo, 2002; Evans et al., 2000b). Although, Malaysia is the world's 20th largest exporter in 1989 and in 2002 has maintained it's ranking as the eighteenth largest exporter, the impact of psychic distance on Malaysian export performance had not been fully explored.

The United States of America (USA) has been the main market destination of Malaysian exports for years. Due to the slow-down in the US economy recently and the corresponding spillover effects on the Malaysian economy, it became imperative in official circles to diversify the market destinations. Malaysian export growth was adversely affected because of this one main export market. Electronic and electrical products are among Malaysian manufacturing segments that have been unable to fully export their products (New Straits Times, 2001). Malaysian firms have been urged to explore new markets in the Middle East region as a means of diversification in order to counter the negative growth in exports of consumer goods. Malaysian trade with west Asian countries grew by 52.7% from RM 8.6 billion in 1999 to RM 12.77 billion in 2000. The Arabian region accounts for 1.9% of Malaysian global trade (New Straits Times, 2001). Malaysia's main product exports to this region include electrical and electronic products, palm oil, rubber based, wood based, and other consumer goods. In order to increase bilateral trade and as a part of new strategy to push its products in the region Malaysia currently operates two trade centers in the Arabic speaking countries, one located in Dubai the capital of United Arab Emirates (UAE) , and the other in Jeddah the most important sea port of Saudi Arabia.

PSYCHIC DISTANCE

In an international business setting exporters are confronted with different conditions that challenge their export ability to foreign markets, such as the market distance which consists of hard dimension (physical distance) as well as the soft dimensions (differences in language, education, business practice, culture, political system and psychological distance). Studies conceptualized that cultural distance is a potential determinant of developing exporter-importer relationships (Feldman & Thompson, 1993; Meschi & Roger, 1994; Conway & Swift, 2000).

The concept of psychic distance was derived from the firm's internationalization process (Johanson & Wiedersheim-Paul, 1975). The Uppsala model of internationalization theory stated that a firm begin exporting process by forming

a relationship with low psychic distance countries, acquiring experiential knowledge about that market and then committing resources in accordance with the degree of experiential knowledge it progressively gained through the relationship (Johanson & Vahlne 1977; 1990).

According to Evans and Mavondo (2002), the word "psychic" is derived from the term psyche, which refers to the soul or mind, while distance is related to similarity or differences in reference to the degree of separation between two points. The definition of psychic distance has been substantially changed. Table 1 presents some definitions of psychic distance in previous studies. The different definitions resulted in a deeper understanding but failed to capture the elements of the concept (Evans et al., 2000a; 2000b; Evans & Mavondo, 2002).

Table 1: Definitions of Psychic Distance in Previous Studies

Author	Definition of psychic distance
Vahlne and Wiedersheim-Paul (1973)	Factors that prevent or disturb the flow of information between supplier and customer.
Hallen and Wiedersheim-Paul (1984)	Differences in perception between buyers and sellers regarding the needs or offers.
Nordstrom and Vahlne (1994)	Factors preventing or disturbing firm's learning and understanding of foreign environment.
O'Grady and Lane (1996)	Firm's degree of uncertainty about a foreign market resulting from cultural differences and other business differences presenting barriers to learning and operation.
Lee (1998) (Cultural distance)	International marketer's socio cultural distance between the home and target country in terms of language, business practices, legal/political systems and marketing infrastructure.
Swift (1999)	Psychic distance is a consequence of a number of inter-related factors, of which, perception is a major determinant.
Evans and Mavondo (2002)	The distance between the home market and a foreign market resulting from the perception of both cultural and business differences

Holzmuller and Kasper (1991) examined the determinants of export performance focusing on the organizational culture (feature of organizational culture, objective organizational characteristics), decision maker characteristics (formal organizational values, manager's psychostructural (psychic distance) and objective characteristics), as well as environmental factors. The variables concerning organizational culture turned out to be the second most important determinant of export performance. In addition, the study found that psychostructural features of export decision makers played important role for export potential of business firms.

Stottinger and Schlegelmilch (1998) found that managers showed high psychic distances toward countries where they had intensive business relationship with. In addition, the results showed no significant impact of psychic distance on export performance. Similarly, O'Grady and Lane (1996) reported that Canadian executives show several cultural differences with U.S. such as (regional differences, consumer differences) and competitive environment (level of competition, employee, management attitudes, values and behavior and relationships). The study found that only 22% of the Canadian executives were functioning successfully in US market and the less successful executives perceived that there were no major differences between the two markets. The study concluded that operating in psychically close countries not necessarily easy to manage and the assumption of perceived similarity may prevent executives from learning critical differences. Evans and Mavondo (2002) examined the relationship between psychic distance and business performance. Classifying the perception of psychic distance into close and distant markets, the results showed that psychic distance explained a significant proportion of the variance in the financial performance and strategic effectiveness in close and distant markets.

Operationalization of psychic distance was the most debatable issue in previous studies. There was no agreement among scholars on how to measure it. Some author used geographical distance as an essential indicator of psychic distance. Other studies used cultural differences only (O'Grady & Lane, 1996). While, others emphasized on using both the cultural and business differences (e.g. Ali 1996; Evans & Mavondo, 2002).

STUDY OBJECTIVE

Exporters should be aware of cultural and business practice differences (psychic distance) that are important when dealing with foreign markets. This study was undertaken to examine the perception of psychic distance and its impact on Malaysian firm's performance in Arabic speaking nations.

METHODOLOGY

The data on which this study is based was collected through mail a survey. The target population is the Malaysian manufacturing firms currently exporting to at least one of the Arabic speaking countries. These countries are: United Arab Emirates (UAE), Qatar, Bahrain, Oman, Kuwait, Algeria, Iraq, Libya, Jordan, Lebanon, Sudan, Syria, Egypt, Morocco, Tunisia, and Yemen. Thus, this study uses purposive sampling. Information about Malaysian companies exporting to these countries was generated from the directory of the Federation of Malaysian Manufacturers (FMM 2002). Approximately 428 firms were identified as exporting to one of these counties. Telephone calls were made to confirm the status of these companies. This step generated 398 names. The remaining 30 companies had either closed down or did not want to participate in this survey. A total of 398 survey questionnaires were sent to the target respondents. To motivate the respondents, a prepaid envelope and small token of appreciation in form of pen were attached with the questionnaire.

VARIABLES AND MEASUREMENT

The review of measurements used in previous studies on psychic distance indicated that a reliable measurement should capture two main components of psychic distance, the cultural and business practice differences (Evans & Mavondo, 2002; Evans et al., 2000b). To precisely measure the cultural differences, this study incorporated the cultural environment in the international marketing context (Terpstra & Sarathy, 2000). Thus, the measurement of psychic distance in this study consists of two dimensions the cultural differences, measured through 23 items covering six dimensions: 1) technology and material culture 2); language 3); Aesthetics 4); education 5); religion, and 6) attitude and values. It also included four dimensions covering business practice differences modified from Evans and Mavondo (2002), consisting of 20 items covering: 1) legal and political life 2); market structure 3); economic environment and 4) business practices differences. The respondents were requested to indicate their perceptions of similarities/differences of their export market and home market (Malaysia) on seven point scale 1= exactly the same, 7= exactly different.

Another variable, export performance was also included in this study, being measured by three different indicators specifically; strategic objectives, financial performance, and satisfaction with export venture. The three indicators was measured on a seven-point Likert scale (1= strongly agree to 7= strongly disagree).

THE SURVEY FINDINGS

A total of 106 usable questionnaires were returned and this represents an overall response rate of 27.92%. The survey questionnaires were answered by key people in the organization represented by general managers (41%), followed by 28.3% senior mangers and 25.5% sales office/administration and the remaining 4.7% identified themselves as export mangers. Table 2 presents the characteristics of the responding firms. It appeared that Arab markets are still new to the Malaysian exporters. Approximately 60 percent of them have only been exporting to these markets for less than 5 years; and another 32.1 percent indicated that they have been in these markets between 6-10 years. In terms of size (measured by the number of employees), 66 percent of the respondents may be classified as large-sized firms. The remaining 34 percent are small and medium –sized firms as they employ less than 150 employees. When sales volume is used as an indicator of size Approximately 60.4 percent of the responding firms recorded sales volume above RM 25 Million, they are classified as large-sized, whereas 36.8 percent of the respondents and classified as small and medium size.

For the export mode, the 72 respondents were classified as exporting directly to customers. This means that (67.9%) of the respondents used direct channel. In terms of products classification, majority of the respondent firms exports food/agriculture and electronic products at (38.7%). The mining, mineral, plastic & chemical products were (13.2%), the metal products and machinery at (11.3 %) and rubber products at (10.4%). A total of (26.4%) of the

respondent firms classified their firms as other sectors such as transportation products and construction materials; wood paper, and printing; textile garments leather; petrochemical products and telecommunication equipments.

Table 2: General Characteristics of the Sample

Variables	Categories	Frequency	%
Export Age	Less than 5 years	60	56.6
	6-10 Years	34	32.1
	More than 10 Years	12	11.3
Number of Employees	10-50 employees	11	10.4
	51-100 employees	13	12.3
	101-150 employees	12	11.3
	Above 150 employees	70	66.0
Sales Volume	1-10 RM Million	18	17.0
	11-20 RM Million	14	13.2
	21-25 RM Million	7	6.6
	Above 25 RM Million	64	60.4
Export Mode	Direct exporters	72	67.9
(Channel)	Indirect exporters	34	32.1
Manufacturing Sector	Food & Agriculture	20	18.9
	Mining Mineral, Plastics, & Chemicals	14	13.2
	Rubber products	11	10.4
	Metal Products & Machinery	12	11.3
	Electrical and Electronic	21	19.8
	others	28	26.4

Table 3 shows the direction of the Malaysian exports to the Arabic speaking nations. There is an obvious concentration in one particular region, with 75 percent of the responding firms identifying Gulf countries as their main market. Majority of the respondents are exporting to Saudi Arabia and United Arab Emirates. Exporters to non-gulf countries are thinly spread over 11 countries.

Table 3: Malaysian Firms Export Destinations in the Arabic Speaking Nations

Groups	Country	Number of Exporters	Percentage	Group %
Gulf countries	Saudi Arabia	16	15.1	
	U.A.E	41	38.7	
	Qatar	6	5.7	
	Bahrain	2	1.9	
	Oman	6	5.7	
	Kuwait	9	8.5	75.5%
Non Gulf countries	Algeria	1	0.9	
	Iraq	1	0.9	
	Libya	2	1.9	
	Sudan	2	1.9	
	Syria	3	2.8	
	Egypt	4	3.8	
	Morocco	1	0.9	
	Tunisia	2	1.9	
	Yemen	6	5.7	
	Jordan	2	1.9	
	Lebanon	2	1.9	24.5%

DATA ANALYSIS

Table 4 present the results of the factor analysis on the questions measuring the cultural and business practice differences. These results had been achieved after deleting 13 items for insufficient correlation (MSA below < 0.5). The (KMO) was 0.85, whilst the Bartlett test of sphericity was significant, both indicating that there is sufficient number of significant intercorrelation for factor analysis. To simplify the factor solution varimax rotation was used, the result showed a five factor solution. Factor one has high loadings on government involvement, consumer protection legislation, business ownership legislation, number of big firms controlling the market, political and economic stability, transportation infrastructure, therefore this factor had been renamed as political legal differences.

Table 4: Factor and Reliability Analysis on Psychic Distance

	Factor Loading				
	1	2	3	4	5
Legal-Political differences					
Degree of government involvement in industry	.92	.06	.10	-.02	.10
Consumer protection legislation	.91	.00	-.03	.10	.03
Business ownership legislation	.90	.03	.04	.06	-.06
Number of big firms controlling the market	.90	.07	.11	-.01	.12
Business licensing procedure	.90	-.04	.08	.01	.04
Ideology of national government	.87	.03	.07	.13	-.03
Political stability	.87	.03	-.01	-.05	.00
Economic stability	.86	-.04	.13	.02	.06
Transportation infrastructure	.85	.07	.08	.12	.16
Business Transaction Procedures					
Use of written contracts in business transaction	-.02	.90	.06	-.08	-.07
Bureaucracy in government agencies	.06	.90	.13	-.01	-.11
Purchasing power for good and services	.05	.89	.11	-.06	.02
Setting up business operating procedures	-.06	.88	.10	-.05	.00
Degree of urbanization	.02	.87	.00	.00	.08
Demands for goods and service	.05	.85	.01	.02	.15
Business negotiation arrangement	.07	.84	.14	.02	-.08
Country's exposure to economic risk	-.05	.83	-.05	.02	.09
Term of business financing	.06	.83	-.01	-.01	-.07
Product Cultural Adaptation					
Advertising color preferences	.13	.08	.90	.06	-.03
Packaging color preferences	.08	.11	.88	.11	.05
Color preferences used for products	.12	.03	.87	.15	-.06
Product packaging design preferences	.08	.19	.87	.04	-.11
Elements of Cultural Differences					
Working days	.03	-.03	.05	.92	.01
Level of education within female	.10	-.03	.03	.89	.09
Types of food used	.08	-.03	.16	.88	.03
Public holidays	.04	-.04	.12	.86	-.09
Dropped					
Sophistication of marketing activities	.09	-.08	-.13	-.01	.70
Concept of fair dealing	.14	.11	-.14	-.06	.64
Role of religious institutions in economic matters *	.17	-.08	.38	.02	.46
Culture convention for doing business *	-.15	.05	.27	.18	.36
Percentage Variance Explained	26.21	22.42	12.60	8.63	-
Eigenvalues	7.86	6.73	3.78	2.59	-
Reliability	.97	.96	.93	.92	-
Mean Value	4.56	4.90	4.39	4.78	
Std. Deviation	1.10	0.90	1.23	1.14	-

* Items deleted due to high cross loading

Factor two has high loadings on use of written contracts in business transaction, bureaucracy in government agencies, purchasing power for good and services, setting up business operating procedures, degree of urbanization, demands for goods and service, business negotiation arrangement and terms of business financing, therefore this factor had been renamed as business transaction procedures.

Factor three has high loadings on color preferences, packaging advertising color therefore this factor had been renamed as product cultural adaptation. Factor four has high loadings on dimensions such as working and holiday, level of education within female, type of food and therefore, this factor had been renamed as elements of cultural differences. Factor five has cross loadings, the items related to this factor seem to be inappropriate, and therefore, this factor was dropped. The factor loading on all the variables ranged from 0.86 to 0.92. These factors cumulatively captured more than 69% of the total variance in the data. The corresponding reliability (Cronbach alpha) for the three factors was 0.97, 0.95, and 0.92 respectively.

EXPORT PERFORMANCE

Table 5 presents the results of the factor analysis for the ten questions related to export performance, three factors were extracted with relative explanatory of 2.56. These three factors cumulatively captured more than 81% of the variance in the data. Since each factor contained the original items, the same names were retained as strategic performance, financial performance and satisfaction with export venture. The reliability for each of the three factors was 0.85, 0.94 and 0.91 respectively.

Table 5: Factor and Reliability Analysis on Export Performance

Performance indicators	Factor Loading		
Strategic performance	F1	F2	F3
Improves knowledge acquisition on new markets	.93	.12	.11
Improve experience for new markets	.89	.12	.14
Improve experiential knowledge on international markets	.87	.05	.08
Significantly diversified export market	.61	.19	-.01
Financial performance			
Generated high volume of sales	.18	.93	.12
Achieved rapid growth	.14	.93	.16
Considered very profitable	.14	.90	.14
Satisfaction with export Venture			
Export to this market is successful	.13	.14	.93
This market met the expectation	.08	.12	.92
Performance is satisfactory	.05	.14	.87
Percentage Variance Explained	42.00	21.35	17.94
Eigenvalues	4.20	2.13	1.79
Reliability	.85	.94	.91
Mean Value	5.62	5.35	5.58
Std. Deviation	0.86	0.93	0.88

PSYCHIC DISTANCE

Classification of low and high for each dimension of psychic distance was done based on the median values as shown in table 6.

Table 6: Low and High Psychic Distance Classification

Dimensions	Psychic Distance	
	Low	High
1- Legal-political differences	57	49
2- Business transaction procedure	45	61
3- Product cultural differences	54	52
4- elements of cultural differences	54	52

RESULTS

The results of the t-test shown in tables 7 indicated that the two groups of exporters with respect to the legal-political differences, product cultural adaptation and elements of cultural differences did not show any significant difference on their strategic, financial and satisfaction performance. However, with respect to business transaction differences the results shows a significant difference between the two groups on financial performance. Those firms of higher business transaction achieved better financial performance than those of lower business transaction.

Table 7: T- test on Export Performance and Psychic Distance Perception

Variables	Psychic .Distance Group means		T value
	Low	High	
Political legal differences	n=57	n=49	
Strategic performance	5.66	5.58	0.51
Financial performance	5.40	5.31	0.50
Satisfaction performance	5.57	5.61	-0.22
Business transaction differences	n=45	n=61	
Strategic performance	5.48	5.73	-1.53
Financial performance	5.13	5.52	-2.29*
Satisfaction performance	5.59	5.58	-0.01
Product cultural adaptation	n=54	n=52	
Strategic performance	5.65	5.60	0.31
Financial performance	5.36	5.35	0.03
Satisfaction performance	5.54	5.63	-0.49
Elements of cultural differences	n=54	n=52	
Strategic performance	5.69	5.55	0.82
Financial performance	5.37	5.34	0.17
Satisfaction performance	5.59	5.58	0.09

* $p < 0.05$

DISCUSSION AND CONCLUSION

The results of this study show that the export performance (financial) is significantly different among the Malaysian firms based on classification of low and high psychic distance. With respect to the business transaction differences, the result indicates that firms with higher business practice differences achieved higher financial performance. This result is consistent with previous study (Evans & Mavondo, 2002) which reported that a significant positive effect of psychic distance with distant market on financial and strategic performance. Foreign market that are perceived to be distant from home market may offer substantial opportunities, thus those firms views higher degree of psychic distance will learn more and plan carefully to exploit these opportunities.

In international marketing, the tendency of exporters to rely on their self-reference criterion or perceived lower degree of psychic distance between home market and export market proves to be unsuccessful exporters (O'Grady & Lane, 1996). Therefore, exporters should learn to appreciate the intricacies of the business practice differences if they are willing to be successful in a foreign market (Cateora & Graham, 2002). Understanding various cultures and business practice differences will definitely help the exporters to form closer ties which in turn improve their performance.

The non significance of the psychic distance dimensions (legal-political differences, product cultural adaptation and elements of cultural differences) may be explained on the bases of the export experience of Malaysian exporters

with their Arab customers, it appeared that the Malaysian firms are still in their earlier stage of understanding the differences between home market and Arabic speaking markets. The understanding of the differences in terms of cultural and business practices can be beneficial in terms of providing the basis for developing organizational learning. In this context, Malaysian firms should be encouraged to learn more about the differences. Although, venturing into non-Gulf markets is important in diversifying experience, and improving the export knowledge. Malaysian firms should be encouraged to venture into non-Gulf markets to capitalize on the different opportunities available in these markets.

REFERENCE

Ali Yunus M (1996). Psychic distance and international joint venture performance. *Proceedings of Academy of International Business Southeast Asia Regional Conference.* University of Otago, Dunedin and Queenstown, New Zealand, 17-20 June.

Cateora, P.R. & Graham, J.L. (2002). *International Marketing*. Fifth Edition. New York: McGraw- Hill.

Conway T & Swift S. (2000). International relationship marketing: The importance of psychic distance. *European Journal of Marketing*, Vol. 34 (11/12) 1391-1413.

Eriksson K, Johnson Jan, Majgard A & Sharma D. (1997). Experiential knowledge and cost in internationalization process. *Journal of International Business Studies,* Vol. 28(2) 337-3360.

Evans J. & Mavondo T. F (2002). Psychic distance and organizational performance: An empirical examination of international retailing operations. *Journal of International Business Studies,* Vol. 33(3) 515-532.

Evans J., Treadgold A. & Felix T M. (2000a). Comment: Explaining export development through psychic distance. *International Marketing Review.* Vol. 17(2) 164-168.

Evans J., Treadgold A. & Felix T. M (2000b). Psychic distance and performance of international retailer. *International Marketing Review.* Vol. 17(4/5) 373-291.

Feldman D.C. & Thompson H.B. (1993). Entry shock, culture shock: Socializing the new breed of global managers. *Human Resource Management.* Vol. 31(4) 345-362.

FMM Directory (2002). Federation of Malaysian Manufacturers, 33rd Edition.

Ford, D. & Leonidou, L. (1991). Research Developments in International Marketing: a European perspective, in Paliwoda, S.J. (ed), *New Perspectives in International marketing*, Routledge: London.

Hallen, L. & Wiedersheim-Paul, F. (1984). *The evolution of psychic distance in international business relationships*, (Ed) University of Uppsala (Department of Business Administration), Uppsala, pp. 15-27. In Conway Tony, & Swift S. Jonathan, (2000).

Holzmuller H. H. & Kasper H. (1991). On a theory of export performance, personal and organizational determinants of export trade activities observed in small and medium-sized firms. *Management International Review.* Vol. 31(Special Issue) 45-70.

Holzmuller H. H. & Kasper H. (1990). The decision maker and export activity: Across national comparison of the foreign orientation of Austrian managers. *Management International Review.* Vol. 30(3) 217-230.

Holzmuller H. H. & Stottinger Barbara (1996). Structural modeling of success factors in exporting: Cross-validation and further development of an export performance model. *Journal of International Marketing.* Vol. 4(2) 29-55.

Johanson I. & Vahlne I. (1977). The internationalization process of the firm. A model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies.* Vol. 8(1) 23-32.

Johanson I. & Vahlne I. (1990). The mechanism of internationalization. *International Marketing Review.* Vol. 7(4) 11-24.

Johanson J. & Wiedersheim-Paul F. (1975). The internationalization of the firm: Four Swedish cases. *Journal of Management Studies.* Vol. 12(3) 305-322.

Kammath, S., Rosson, P. J., Patton, D. & Brooks, M. (1987). Research on Success in Exporting: Past, Present, and Future, in Rosson, P. J. and Reid, S. D., eds., *Managing Export Entry and Expansion: Concept and Practice*, Praeger: New York.

Lee Dong-Jin (1998). Developing international strategic alliances between exporters and importers, the case of Australian exporters. *International Journal of Research in Marketing.* Vol. 15(4) 335-348.

Meschi P. X. & Roger A. (1994). Cultural context and social effectiveness in international joint venture. *Management International Review.* Vol. 34(3) 197-215.

New Straits Times, Thursday August 9 2001 Page 28.

Nordstrom K.A. & Vahlne E. Jan (1994). Is the global shrinking? Psychic distance and the establishment of Swedish sales subsidiaries during the last 100 years. Paper Presented at The International Trade and Finance Association Annual conference 22-25 April Laredo, TX. In Evans et al., (2000b).

O'Grady S. & Lane W. Henry (1996). The psychic distance paradox. *Journal of International Business Studies.* Vol. 27(2) 309-333.

Stottinger B & Schlegelmilch B. B (1998). Explaining export development through psychic Distance: Enlightening or elusive. *International Marketing Review.* Vol. 15(5) 357-372.

Stottinger B. & Schlegelmilch B. B. (1998). Explaining export development through psychic Distance: Enlightening or elusive. *International Marketing Review.* Vol. 15(5) 357-372.

Swift S. Jonathan (1999). Cultural closeness as a facet of cultural affinity: A contribution to the theory of psychic distance in international marketing. *International Marketing Review.* Vol. 16(2/3) 182-201.

Terpstra V & Sarathy R (2000). *International marketing.* The Dryden Press. Highcourt College Publishers, 8th Edition.

Vahlne J. E. & Wiedersheim-Paul F. (1973). Economic distance: model and empirical investigation. In Evans (2002).

Reverse Marketing: Do Not Overlook the Role of Purchasing

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ABSTRACT

Earlier times, purchasing play a passive role in the business operation of firm and responds to the marketing efforts to current and potential suppliers. This initiative is with the supplier not the purchaser. However, globalization and advancement in technology conjure the shift of the purchasing function to a strategically one. Purchasing now serve to support the production and operation with an uninterrupted flow of materials and services without wastage. Integration of the purchasing function into a firm's strategic planning proves to be crucial for a firm's survival and success. In other words, purchaser will be the initiator, instead of being persuaded to buy, now tries to persuade the supplier to provide – reverse marketing. Thus, this study is to examine the purchasing role in strategic planning of manufacturing firms. Data are collected by means of mail survey questionnaires, which were distributed to 100 respondents, by means of systematic sampling. Feedback and correspond sum up to 54 firms. Major findings of the study have shown that organizations do recognize the significance of purchasing to the company. In addition, the trend of outsourcing has enable strategic purchasing to pave the way for organizations to move forward.

INTRODUCTION

The purchasing function has undergone tremendous change over the past two decades, much of which has been induced by factors outside the organization (Macbeth and Ferguson, 1994). In the past, it was perceived as a clerical activity, which assumes day-to-day operational that has little to do with overall corporate competitive strategy. However, today buying procedures are being transformed into profit generation activities.

Annual expenditures by purchasing managers are estimated to exceed $2 trillion- an amount that represents the single largest expense of doing business (Lambert and Stock, 1993). Since purchasing is typically responsible for spending over 50 percent of corporate revenues for requisite goods and services (Chao, 1989), the function is appropriately positioned to be a key contribution to both the formulation and execution of a strategic plan (Lee and Dobler, 1977).

In today's environment, with emerging new market forces, the fluctuation of price is inevitable. This is where purchasing plays an important role in ensuring the ease of resources flow. As purchasing is critical to a company's success, its crucial integration in the corporate strategic planning is imperative and companies are now advocating harnessing purchasing as a strategic function to increase profit margin. Presently, there has been modest research conducted on this subject in the context of Malaysia environment. Thus, the basic purpose of this research is to determine the role of purchasing in strategic planning among the manufacturing firms in Johor, Malaysia. In this study, we will look into the perception of purchasing management team regarding purchasing, the position of purchasing in strategic planning and also the new emergence of opportunity for participation of purchasing function in strategic planning.

LITERATURE REVIEW

Evidence suggests that prior to the 1980s, involvement of purchasing function in the corporate strategic planning have been limited.

Ammer (1974) reported that top management described purchasing as having a passive role in the business operation of firm. However, the oil crisis of 1973-74 and shortage of related raw materials brought recognition to the importance of purchasing. But top management and purchasing professionals have not responded positively to improve the role of purchasing in corporate strategic planning (Farmer, 1978).

Not only the factor of top management perceptions that prevented the purchasing function from being viewed as a strategic function. There are another two main factors such as the focus of the purchasing function activities, and the perceptions of purchasing personnel themselves had prohibited the movement of purchasing function from clerical to strategic level (Farmer, 1981).

However, the 1980s were a period of shifting attitudes toward the purchasing role in corporate strategic planning. While many researchers reported the advantages of greater strategic involvement by purchasing function, limited gains appeared to be made until late in the decade.

The integration purchasing strategies with corporate strategies only can be done once strategic are part of the firm operations. This notion was supported by Spekman (1981) findings that purchasing managers do seek the need for strategic planning within the purchasing function.

According to Burt and Soukup (1985), they stated that purchasing must be integrated into the process and strategy of developing new product in order to increase both performances in operating corporate business. Moreover, Landeros and Monczka (1989) also suggested that purchasing function should demonstrate as an instrumental role in supporting the corporate strategic positioning.

During the 1990s, most of the research findings seem to have moved toward integration aspect, which mean the purchasing function are being recognized as a significant contributor to the firm's success.

According to Reid (1990) study, purchasing should be fully aware of the corporate competitive strategy, which is best achieved when purchasing participates in the corporate strategic planning. As strategic support and involvement develop, purchasing can pave the way to move from an operational to a strategic function within the organization. Research performed by Watts et al. (1995) has confirmed Reid's findings. While, Monczka (1992) research noted that purchasing must assume a proactive role in working with other factions to formulate and implement competitive strategy, and to reduce obstacles between purchasing and other functions.

In the late of 1990s, Murphy (1996) reported that electronic ordering appears to be trend for the future. And the purchasing organization seems to follow such an industry trend. As a matter of fact, in a recent purchasing magazine survey reported that about 81% of the respondents indicated their plan to implement eBusiness as a purchasing tool for future procurement system. Initially eProcurement has concentrated on corporate efficiency by improving data flow and error reduction, however, it has now viewed as strategic (Attaran, 2001).

In conclusion, recognition of the purchasing function that evolved in corporate strategic planning is actually rooted from the field of marketing, and specifically in investigations of industrial buying behaviour. Many researches believe that the purchasing function can contribute to the success of firm by integrating with and supporting the corporate strategy.

For those purchasing function that have not implemented e-procurement need to consider their decision. With corporate budgets currently focus on lowering expenses, purchasing management team especially managers need to direct some of this momentum to purchasing. This will help elevate the purchasing role ever higher in their organizations and enable top-level management to lead their companies through what will hopefully be the next stage of prolonged corporate profits (Min and Galle, 1999).

METHODOLOGY

To date, there is very minimal effort or related studies of purchasing role in strategic planning been conducted in Malaysia. Nonetheless, in this context, secondary data has provided and enable the researchers to identity and define the problem, develop the research objectives, and interpret primary data with more insight. In addition, data searching through online, such as referring to the annual Bank Negara Reports, and visiting the websites of Department of Statistics Malaysia and Bank Negara Malaysia.

However, in this study, the researchers relied heavily on the use of active primary data collection methods. Because business is largely of a social phenomenon, dealing with people, much of the data needed to make decision has came from the respondents themselves. Active data collection methods using questionnaires are designed specifically to obtain large amounts of information from human respondents (Davis, 1999). The mailing survey technique had been chosen to conduct the research. The value of this approach is that it allows the researchers to standardize the questioning to such an extent that a more numerate, statistically based analysis is possible. Moreover, it allows the respondents more time to think about his or her responses than any of the unstructured techniques (Selltiz et al., 1976).

Due to an increasing representative ability, the probability systematic was chose to get the sample of population for the research (Malhotra, 20220). The sampling frame consists of 100 respondents (refer to purchasing management team or personnel) of the manufacturing firms that being compiled in the Johor Industry Guide. Because of close-ended format, data collected are statistical in nature. Due to the user-friendly and with easy-to-use procedures, the latest Windows of SPSS version 10.0 was used to analyse the data collected. In this case, the researchers applied the measurement such as frequency (table), percentage distribution, and central tendency in order to make the data usable and understandable at management perspectives.

FINDINGS

Table 1 as below presents the organizational profile from the respondents whereby 48% classified under industrial equipment and followed by electrical and electronic sectors. 93% are private limited (Sdn Bhd) in nature; majority of the firms employed within 101-500 employees, which contributes 35%, followed by firms employing within 51 – 100 people. Furthermore, most the firms (50%) earned more than or equal to RM20 million of gross sales turnover annually, followed by 38% earned within the range of RM1 million to RM10 million. Meanwhile, most of the respondents (56%) work as middle level management such as Manager or Head of Department, followed by 39% in the low level management such as Purchasing Executives. This signifies majority of the firms are in the small and medium industries.

Table 1:Organizational Profile of Respondents

Business Sector	Percent (%)
Automobile parts	4
Engineering & Construction related products	6
Electric & electronic	20
Foods & beverages	6
Household goods	9
Industrial equipments	48
Textiles	7
Organizational Type	
Private limited (sdn bhd)	93
Non-listed public limited (bhd)	7
Total Employees	
≤ 50	9
51 – 100	24
101- 500	35
501- 1,000	13
≥ 1,000	19
Sales Revenue	
≤ RM 1 million	6
≥ RM 1 million	38
≥ RM 10 million	6
≥ RM 20 million	50
Job Title	
Top Level Management	5
Middle Level Management	56
Low Level Management	39

For supply to be a strategic priority, purchasing function should strive to contribute to the success of corporate competitive strategy by pursuing internally consistent with the objectives as illustrated in Figure A. For example focusing on cost is purchasing objectives when the firm is pursuing cost leadership in the market and focusing on quality in purchasing objectives when the firm seeks to achieve differentiation in the market (Goh et al., 1999) besides improving profitability.
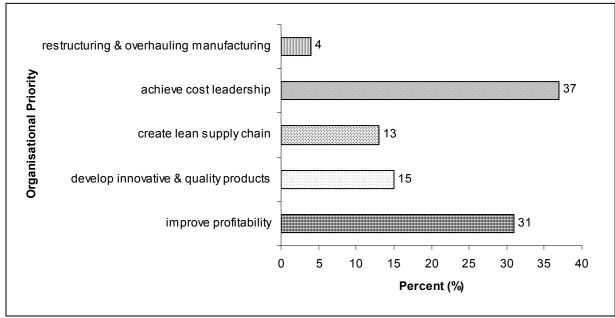
Figure A: Organizational Priority Of Respondents (Over Next Three Years)

While, Figure B illustrates firms focused on aggressive cost savings (72%) as the greatest impact on purchasing function during recession. Conversely firms (15%) stated there is no significant impact and 13% will do reassessment on the system. This indicated (minority) that a traditional model of price-driven procurement behaviour is hard to change. However, implementing long-term change management is a must if purchasing is to take its rightful place among the influencers of corporate strategy Cousins and Spekman, 2003).
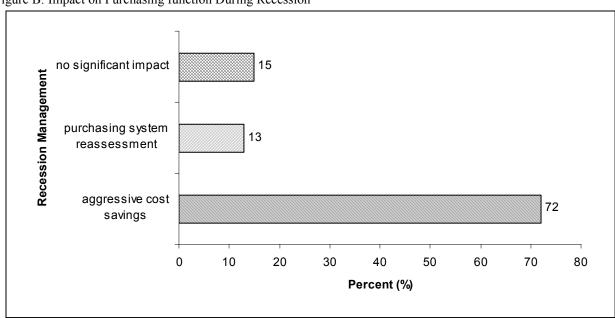
Figure B: Impact on Purchasing function During Recession

From Figure C, it shows that most of firms (46%) has integrated the purchasing strategy in other words, involved in formal business planning, while 28% only have direct support in the organizational planning. The strategic alignment model developed by Cousins and Spekman (2003) shows the importance to integrate purchasing strategy with corporate strategy as a strategic player of firm. If purchasing is not directly supports corporate strategy, the problem as exhibits in Figure D that majority of the (48%) respondents stated it was difficult to align purchasing strategy with strategic goals during implementing change in purchasing function.

Figure E shows most of the respondents perceived purchasing role to maximize cost savings have ignored to view procurement as essential to managing organization wide thinking where suppliers contribute value that is leveraged to achieve competitive advantage for the entire supply chain is becoming a reality (Carter et at., 1996).

Figure C: Integration of Purchasing Strategy with Corporate Strategy
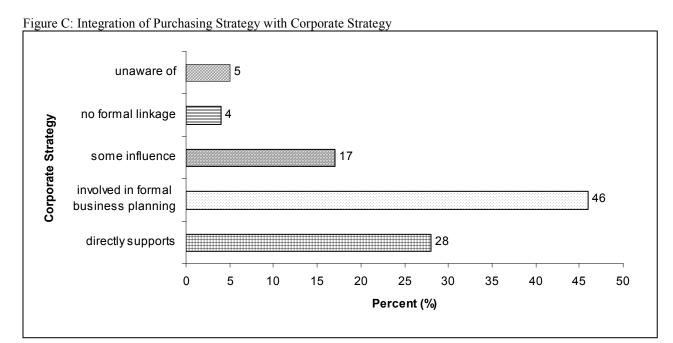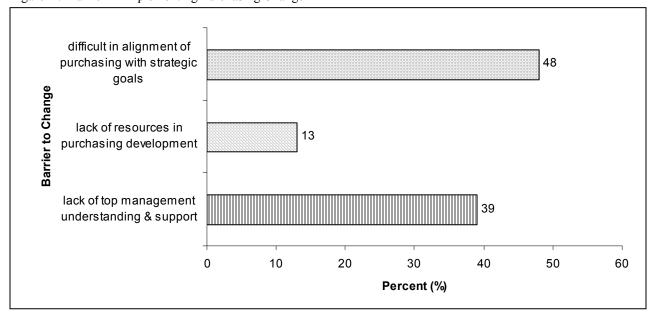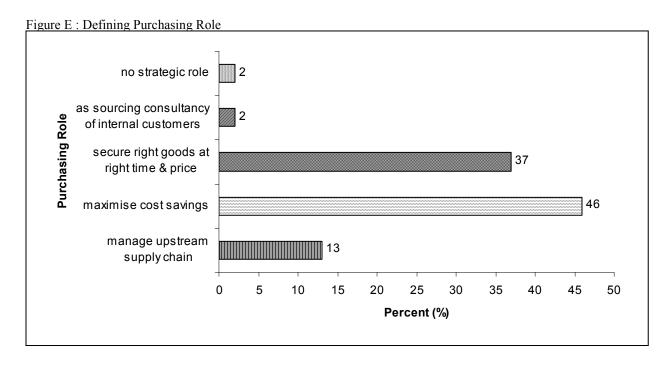
Figure D: Barrier in Implementing Purchasing Change

Figure E : Defining Purchasing Role

This revised viewpoint requires that top management recognize the critical role purchasing can play in shaping the competitiveness of the organization. The CEO regards the status of the purchasing function as important if it contributes to the overall success of the organization and is able to increase organizational profits effectively (Goh et al., 1999). While in Figure F, the majority of respondents' top executives declared that purchasing makes a valuable but secondary contribution as they were asked to assess the purchasing contribution to overall organization success.

All of these have noted that purchasing is not fully viewed as a strategic player in many organizations partly by their own deeds. There is still a substantial number of purchasing professionals have not rise to the challenge of adapting to the new concept of purchasing, this in turn will incur the company with more obstacles.

However, purchasing management is no doubt entering a new era. Such as, there are indicators that some of firm's intent to make online purchases in the future. As presented
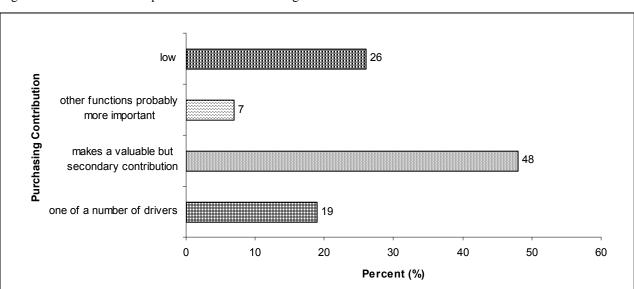
Figure F: Assessment of Top Executives on Purchasing Contribution
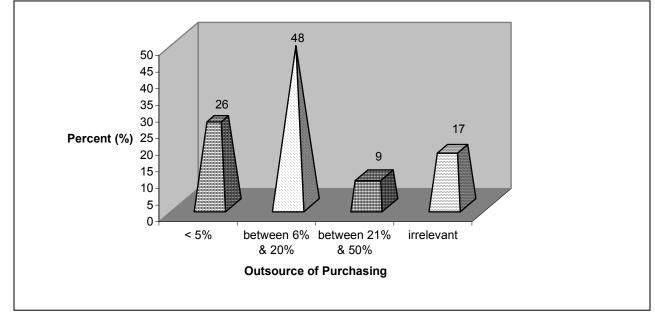
Figure G: Planning to Outsource of Purchasing Function (Over the next 3 years)

In Figure G, firms that planned to outsource their purchasing function indeed are to reinforce the purchasing role in strategic cost management (Carter et al., 1996). About 48% of firms planned to outsource the purchasing unction in between 6% to 20% of total purchases by value.

In order to compete in the new era, purchasing managers need to search for the right strategic area such as new product development and service or indirect purchasing or developing strategy that in line with organizational priority. Strategic purchasing such as eBussiness, Supply Chain Management has been widely recognized for its ability to perform value-added activities in an organization. It offers new opportunity for the purchasing management team to take advantage of in playing a lead role in strategic planning.

CONCLUSION

The study has determined the existence of purchasing awareness among organizations' top management and purchasing management team through analysis of their perceptions of the purchasing function. Though awareness exists, the understanding of purchasing in the full context is still lacking, as it is still being perceived as a secondary contributor to the organizations' success. Moreover, many did views of it prone to the conventional concept or purchasing. In terms of the integration in strategic planning, it is reveal that participation is limited. However, a shift of the purchasing function from clerical to tactical role is a good indication of a move forward towards strategic purchasing. In addition, advancement in IT poses many opportunities for organizations to co-ordinate the purchasing functions with other functions and integrates the function with strategic goals.

In reference to the results and discussions of this study, a few aspect and areas are identified for suggested future research. As this research is conducted in the state of Johor, the result of the research does not represent the Malaysia as a whole. Furthermore, this research is only carried out among manufacturing firms. It is propose that future research to be conducted in other states of Malaysia and also include non-manufacturing firms for more viable findings. With the growing acknowledgement of purchasing as a strategic role, there is a need to study the relationship between firm size and degree participation of purchasing function in strategic planning.

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REFERENCES

Ammer, D.S. (1974). "Is Your Purchasing Department a Good Buy?" *Harvard Business Review*. March-April. 36-159.

Attaran, M. (2001). "The coming age of online procurement." *Industrial Management & Data Systems*. 101 (4): 177-180.

Burt, D.N. and Soukup, W.R. (1985). "Purchasing's Role in New Product development." *Harvard Business Review*. September-October. 90-96.

Carter, J.R. and Narasimhan, R. (1996). "Purchasing and supply chain management: Future directions and trends." *International Journal of Purchasing and Materials Management.* 32 (4): 2-12.

Chao, C.N. (1989). "Purchasing performance measurement-views of purchasing nanagers, buyers and internal customers from different industries." Doctoral Dissertation, Arizona State University.

Cousins, P.O. and Spekman R. (2003). "Strategic supply and the management of interand intra-organisational relationships." *Journal of Purchasing and Supply Management.* 9 (1): 19-29.

Davis, U. (1999). "Business Research for Decision Making." 5th ed. Duxbury.

Farmer, D. (1978). "Developing Purchasing Strategies." *Journal of Purchasing and Materials Management.* 14: 6-11.

Farmer, D. (1981). "Seeking Strategic Involvement." *International Journal of Purchasing and Materials Management.* 17: 20-24.

Goh, M. Geok T.L. and Neo, L. (1999). "Strategic role and contribution of purchasing in Singapore: A survey of CEOs." *Journal of Supply Chain Management*. 35 (4): 12-23.

Lambert, D.M. and Stock, J.R. (1993). "Strategic Logistics Management." 3rd ed. Homewood, Illinois: Irwin.

Landeros, R. and Monckza, R.M. (1989). "Cooperative Buyer/Seller Relationships and a Firm's Competitive Strategy." *Journal of Purchasing and Materials Management*. 25 (3): 9-18.

Lee, L.J.and Dobbler, D.W. (1977). "Purchasing and Materials Management: Text and Cases." 8th ed. New York, N.Y.: McGraw Hill.

Macbeth, D. and Ferguson, N. (1994). "Partnership Sourcing: An Integrated Supply Chain Approach." London: Pitman.

Malhotra, N.K. (2002). "Basic Marketing Research: applications to contemporary issues." 1st ed. Upper Saddle River, N.J.: Prentice Hall.

Min H. and Galle, W.P. (1999). "Electronic commerce usage in business-to-business purchasing." *International Journal of Operations & Production Management.* 19: 909-921.

Monczka, R.M. (1992). "Integrating Purchasing and Corporate Strategy." NAPM Conference Proceedings. 1-6.

Murphy, E. (1996). "Electronic systems alter the buying process." Purchasing. May. 24-28.

Reid, D.R. (1990). "Purchasing and Manufacturing Strategy." Research Symposium.

Selltiz, C.S., Wrightsman, L.S. and Cook, S.W. (1981). "Research Methods in Social Relations." 4 ed. Holt: Rinehart and Winston.

Spekman, R. (1981). "A strategic Approach to Procurement Planning." *Journal of Purchasing and Materials Management*. Winter. 3-9.

Watts, C.A., Kee, Y.K., and Chan, K.H. (1995). "Linking Purchasing to Corporate Competitive Strategy." *Journal of Supply Chain Management*. 31 (2). 5-6.

Learning Management System

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ABSTRACT

This study emphasizes on preparing a learning mechanism to be used by users in two levels of education, school and higher level institutions. The development of the system aimed to utilize IT as an alternative learning medium to substitute conventional learning in lectures room. Besides, a good learning platform must provide an effective and efficient way of communications between instructors and students. Comparing to the conventional methods of learning, online course management system can provide better method to prepare learning materials by fully utilizing the resources online and this open up a new dimension in education field. The beauty of the system is on its system's capabilities to integrate a new effective course management system in web environment. This work attempt to develop an integrated course management system which can be used in any level of education and this is hoped to bring up ideas for education sectors in Malaysia especially to customize their own online course management system in the future.

INTRODUCTION

The opportunities and challenges associated with using the Internet in teaching have come to the forefront of debate with the rapidly increased awareness and use of this technology in recent years (Phillip Shapira & Jan Youtie, 2004). Nowadays, electronic mail (e-mail), electronic transfer and file sharing have become ubiquitous for research purposes and instructors-students communication. World Wide Web has emerged as a significant information resource and research tool. Instructors now use the Internet to make course outlines, to search for reading materials, and resource links available to their students through various pages available on the web.

Yet, the Internet can be used not only to send text-based messages, share files, or display web pages, but also to transmit audio and video content and to conduct electronic conferences. Many universities are now implementing courses online as an effective learning tools for their students. Internet-based learning technologies are also being promoted for campus-based students as well as a tool for distance learning.

Phillip Shapira & Jan Youtie (2004) says, however, while the rapid development and dissemination of Internet technology generates new possibilities for universities, it is also apparent that a series of critical pedagogic, usability, and resource issues are raised. For example, can Internet links effectively involve students in remote locations, off-site from the traditional classroom? What are the equipment, software, skill, time, and financial requirements? What additional technical support will "regular" (i.e. non-computer specialist) faculty members need to employ these new technologies? How will traditional classroom teaching change as new networked learning environments are developed which are less constrained by physical space and institutional boundaries? Will institutions, faculty, and students who do not – or cannot – embrace these new technologies be sidelined? And, most fundamentally, is student motivation, learning, and understanding actually improved by using new Internet technology?

However, the rapid and pervasive spread of the Internet is likely to generate a further, hotly contested round of controversy. Advocates of greater Internet use in teaching suggest that it can improve the support of group-based learning, as well as self-paced learning (Chute, Sayers, and Gardner 1998). The Internet can speed communication and information flows, and make courses more engaging by adding sound and video content (Ellis 1997). It also offers the potential for "classrooms without walls" or "virtual classrooms" that can allow the development of geographically dispersed learning communities (Neal 1997). Indeed, major universities plan to reach thousands of degree students through off-campus, distance teaching over the next decade. One university's vision is that future students will be able to "take courses and earn degrees free from time and space constraints" (Center for Distance Learning, 1998).

On the other hand, online education raises major issues. Garson (1996, 1997) worries that the additional faculty time needed to develop online courses may reduce student mentoring. He also highlights the difficulty of meeting user expectations, negative impacts on academic quality and traditional university scholarship, and

potential equity issues. Some students have voiced concerns about the technological transformation of university education, the severing of links between students and teachers, and the negative effects on student inquiry. "We don't want edutainment," commented one student at a recent conference on 'Digital Diploma Mills'. "What we want is people to inspire and infuriate us" (Winner 1998).

This paper attempts to discuss about how a virtual learning system can overcome the limitations in traditional classroom, what it offers, and highlighting features for an effective and efficient virtual learning system. Hopefully, the immergence of Internet technology will bring variety of ideas in preparing better methods in educational enhancement in the future.

OVERVIEW OF TRADITIONAL LEARNING

Traditionally, learning methodology will involve these processes: instructor will deliver lectures in lectures' rooms and exercises will be given right after every discussion topics are taught.

Normally, learning are started with instructors who teach followed by certain textbooks and writing notes on the teaching board in front of class. After finishing certain topics, exercises and assignments are then given to students. Typing exercises or assignments are given to students by hand. Then, students' will start answering questions under instructors' supervision in time allocated. After finishing answering questions, students will submit their answers to instructors by hand. Then, instructors will check the answers' scripts and return the mark to students after the marks and grades are recorded. This process will be repeated until students finally sit for their final examination.
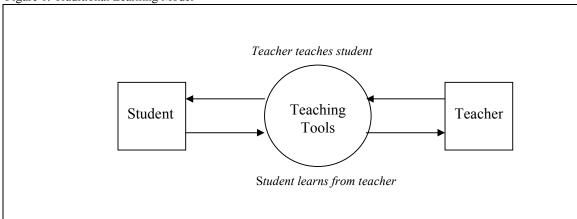
Few academicians doubt the ability of students schooled in problem based learning to exhibit strong reasoning and team building skills. Concern has been raised, however, over the breadth of content covered. Because the focus of problem based learning centers on a specific problem, academic achievement scores often favor traditional teaching methods when standardized test are used, but favor neither method when non-standardized forms of assessment are employed (Vernon & Blake, 1993). These measures include problem-solving ability, interpersonal skills, peer-faculty relationships, the ability to reason, and self-motivated learning. In contrast, traditional instruction is judged better in the coverage of science content areas (Albanese & Mitchell, 1993, Vernon, 1995) and in evaluating students knowledge content. Although problem based learning tends to reduce initial levels of learning, it improves long-term retention (Farnsworth, 1994).

Although students generally favor problem based learning courses, and their ability to solve real-life problems appears to increase over traditional instruction, instructors have not resoundly supported the movement toward this type learning. Contributing to this divergence is the time requirement placed upon faculty to assess student learning (Delafuente, Munyer, Angaran, & Doering, 1994; Vernon, 1995), prepare course materials, and allow students to complete the reduction in coverage of course material due to the inefficiency of problem based learning.

CAST (2002) says that most of traditional classes are dominated by sole medium that is text books. This domination prohibit instructors from getting into all students and otherwise forcing them to use text books instead and creating obstacles to those who do not use text book. Those who like to read text book do not promise success. This is because there is other learning medium which is more appropriate to be used in classrooms. Students' choice to certain media and learning tools can boost up their achievement and success even though they use variety of media in their learning process.

Figure1 shows traditional learning model at school. Instructors will give lectures via teaching tools such as teaching board or OHP. Notes and exercises will be written on the teaching board or printed on papers to be given to students. Then, students will copy the given notes and exercises before return them back to instructors to be marked.

Figure 1: Traditional Learning Model

Teacher teaches student

Student → Teaching Tools → Teacher

Student learns from teacher

DEVELOPMENT OF E-LEARNING PLATFORM

The emergence of Internet has brought convergence of learning including bank of data and information to flow easily through the net. Every people who engage in education sector especially and others can easily search for as many information as can through the availability of Internet technology. Internet technology has brought a variety of resources which can be used at anytime and anywhere.

Cisco Systems (2004) define an E-learning as an Internet-enabled learning. Components can include content delivery in multiple formats, management of the learning experience, and a networked community of learners, content developers and experts. e-Learning provides faster learning at reduced costs, increased access to learning, and clear accountability for all participants in the learning process. In today's fast-paced culture, organizations that implement e-Learning provide their work force with the ability to turn change into an advantage.

While the arrival of Internet technology generates new possibilities for educational institutions and businesses, it also raises a series of critical pedagogic, usability, and resource issues. For example, can Internet courses effectively involve students in remote locations, off-site from the traditional classroom? What are the equipment, software, skill, time, and financial requirements? What additional technical support is needed? How will teaching methods change in new networked learning environments less constrained by physical space and institutional boundaries? How can Internet-based courses be compared with traditional courses in terms of university credit and degree requirements? Will institutions, faculty, and students who do not - or cannot - embrace these new technologies be sidelined? And, most fundamentally, is student motivation, learning, and understanding actually improved by using new Internet and multimedia technologies? Contrasting responses to the kinds of questions raised above are already apparent. In many ways, they are not entirely new questions. Over the last twenty years, other technologies applied to education, such as televised lectures to remote students, have stimulated similar debates. However, the rapid and pervasive spread of the Internet is generating a further, hotly contested round of controversy. Advocates of greater Internet use in teaching suggest that it can improve group-based instruction, as well as self-paced learning (Chute, Sayers, and Gardner 1998).

The Internet can speed communication and information flows, and make courses more engaging by adding sound and video content (Ellis 1997). It also offers the potential for virtual classrooms that reach geographically dispersed learning communities (Neal 1997). One university's vision is that thousands of future students will be able to "take courses and earn degrees free from time and space constraints" (Center for Distance Learning 1998). Not all educators are as sanguine. Garson (1999) worries that the additional faculty time needed to develop online courses may reduce student mentoring. He also highlights the difficulty of meeting user expectations, negative impacts on academic quality and traditional scholarship, and issues raised by inequitable access to online opportunities. Other faculty and students voice concerns about the technological transformation of university education, the rise of 'Digital Diploma Mills', the severing
of links between students and teachers, and the negative effects on student inquiry (Noble
1998; Winner 1998; Hara and Kling 1999).

Synchronous Internet delivery more closely matches what we consider the traditional classroom model than does asynchronous delivery. The traditional model could be translated into web-based learning if a number of features existed. Some of these features include:

- allowing individual and group work
- presentation formats incorporating both discussions or lectures
- learning from both the instructor and other student input
- resource tools and materials that can be introduced, presented, shared and removed
- student activity that can be monitored and facilitated by the instructor

SYSTEM OVERVIEW

LMS is developed by using a web programming language that is Active Server Pages (ASP). This programming language support the usage of scripting languages such as JavaScript, VBScript, Hypertext Markup Language (HTML) and Structured Query Language (SQL). Active Server Pages is chosen because it is Windows-based and can be connected directly to database used which is Microsoft Access.

Functional Requirement

Generally, Learning Management System (LMS) can provide facilities as follow:
1. Prepare notes
2. Prepare questions
3. Submitting and check for assignments
4. Marking tools
5. Feedback to students
6. Effective communication among student-student and student-instructor

Hardware Requirements

LMS is developed in personal computer (PC) environment which is networked in Web environment.

For client computer, minimum hardware requirements are PC with minimum capacity CPU of 486 or Pentium, memory at least 16MB, network card and modem, also SVGA monitor.

For server computer, minimum hardware requirement needed are high capacity CPU, for example Pentium 4 and larger memory, for example 256MB or more. This to ensure large processing scale can be done in one time.

Software Requirements

For client computer, system software needed to run this system is operating system like *Windows 95* or above. Meanwhile Internet browser to run the system is Java enabled browser such as *Internet Explorer*, and *Netscape Navigator*. For Server computer, system software needed is operating system like Windows 2000 meanwhile Internet browser must be Java enabled browser such as Internet Explorer and Netscape Navigator. System development tools are *Microsoft Visual InterDev 6*.0 for coding resources for programming language used which is *Active Server Pages (ASP)*.

Scripting language used to support web applications are *Visual Script* and *Java Script*. Meanwhile, *Structured Query Language (SQL)* is used to connect system application to database which is *Microsoft Access*. *Macromedia Dreamweaver 3*.0 is used to design system interfaces which include background color, pictures, layout, interfaces, etc. Application software for database is *Microsoft Access* for *Windows* version 7.0 and above. File processing software for text used is *Notepad*.

System Architecture

The proposed system (LMS) is a web-based system and run under client-server environment. It has several components including Web Server, Database, and Web Browser.

Figure 2: LMS System Architecture
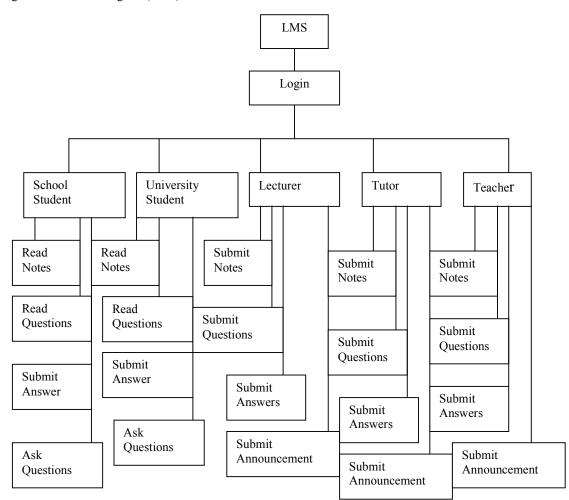
System Development

Below, is structure diagram for LMS. There are several module and sub-module provided by the system.

Figure 3: Structure Diagram (LMS)

Interface Design

Below, are examples of main interfaces of LMS. Figure 4 shows login interface of LMS. Every registered user of LMS is required to login before assessing the system. Those who is unregistered, they are required to register first before they are given their username and password to login.

Figure 4: Login Interface (LMS)
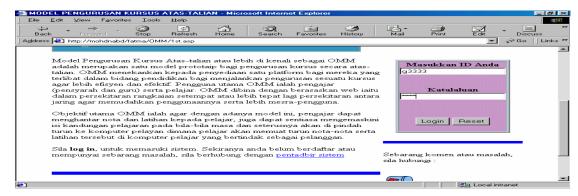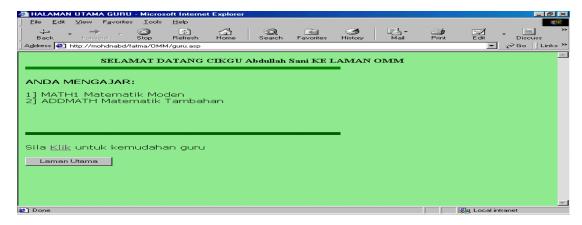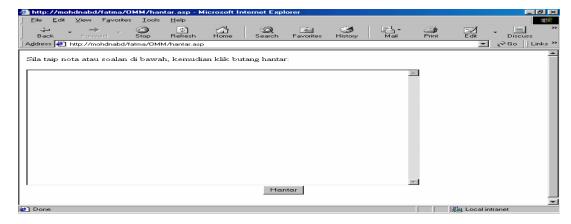
Figure 5 is interface for teacher. Every teacher who get access to the system will be recognized by LMS as registered teacher who teach certain courses.

Figure 5: User Interface (Teacher)

Below, is example of notes/questions sending facilities by teachers. Teachers will submit notes or questions in the spaces provided and then upload to a file in server that can be accessed by students later on.

Figure 6: Notes/Questions Sending Facilities

CONCLUSION

Each type of learning methods has its own strengths and weaknesses. To fully substitute traditional methods into new learning methods as E-learning, it will take time to prove to everybody that this kind of learning is better compare to traditional methods of learning. Yet, several features need to be improved such as how to make sure that effective communication can flow easily from student to student and from instructor to instructor or from instructor to students. This is very important in order to make sure what instructors intend to disseminates will come easily to students, also if students do have questions to ask, how to make sure these questions will come instantly to instructors and instructors' feedback will also come instantly. This will ensure effective and efficient learning for both parties who involve in learning and teaching.

Based on the study done by several authors and questionaires distributed to students, below are the conclusion that we can collect about E-learning:-

1. Internet-based learning requires more preparation time for the instructors than typical conventional course.
2. Preparation need to be done first before installing any course online. For instance, there must be Internet access for the students or instructors in order to make sure the course is running.
3. There must be a brave change for everybody who intend to switch to Internet-based learning as their sole learning method
4. Communication between student-student, student-instructors, or instructor-instructor should be enhance to enable effective communication among them
5. Every parties who involve in E-learning should be alert to new technology from time to time
6. Instructors must make sure that resources are sufficient for students especially course materials like notes and text references
7. There is no more face-to-face interaction between students and instructor. Course developer must find ways how to make this interaction so that learning will be transparent to everyone involved
8. Students will be highly motivated in E-learning but the content and approach must always be changed to avoid students from boring
9. Possibly, student interest in this mode of learning is temporal and will decline, as Internet-based learning becomes more common
10. In this sense, while Internet technologies offer new possibilities for teaching, these technologies offer few short cuts to educators and administrators if the goal is an improved student learning environment with high interactivity.

REFERENCES

Campus Computing Project. 1998. Colleges struggle with IT planning. *National Survey of Information Technology in Higher Education.* 10 Sep. 1999, http://www.campuscomputing.net.

Center for Distance Learning. 1998 (October). Overview of recent developments in distance learning at Georgia Tech. Atlanta, Ga.: Georgia Institute of Technology. PowerPoint presentation transmitted by email..

Chute, A., P. Sayers, and P. Gardner. 1998. Networked learning environments. CEDL Published Articles, Lucent Technologies Center for Excellence in Distance Learning, 24 Sep 1999, http://www.lucent.com/cedl/networked-learning.html.

Delafuente, J. C., Munyer, T. O., Angaran, D. M., & Doering, P. L. (1994). A problem solving active learning course in pharmacotherapy. *American Journal of Pharmaceutical Education.* 58(1), 61-64.

Dolmans, D. H., Gijselaers, W. H. & Schmidt, H. G. (1992, April). *Do students learn what their teachers intend they learn? Guiding processes in problem-based learning.* Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

Ellis, B., compiler and editor. 1997. Virtual classroom technologies for distance education: The case for online synchronous delivery. DETAC Corporation. 24 Sep. 1999, http://www.detac.com/solution/naweb97.htm.

Garson, G.D. 1999. The role of technology in quality education. Raleigh, N.C.: North Carolina State University. 24 Sep. 1999, http://hcl.chass.ncsu.edu/sscore/garson2.txt.

Hara, N., and Kling. 1999. Students' frustrations with a Web-based distance education course: A taboo topic in the discourse. CSI Working Paper, Indiana University, Bloomington, Ind. 10 Sep 1999, http://www.slis.indiana.edu/CSI/wp99_01.html.

Mandin, H., Harasym, P., and Watanabe, M. (1995). Developing a "clinical presentation" curriculum at the University of Calgary. *Academic Medicine,* 70(3), 186-193.

National Research Council. 1993. *Learning to Change: Opportunities to Improve the Performance of Smaller Manufacturers.* Washington, D.C.: National Academy Press.

Neal, L. 1997. Virtual classrooms and virtual communities. Proceedings of ACM Group 97 Conference, Phoenix, Ariz.: November 16-19. 10 Sep., http://www.lucent.com/cedl/group97.html.

Noble, D. 1998. Digital Diploma Mills: The automation of higher education. *Science asCulture* 7(1): 355-368.

Reithlingshoefer, S. J. (Ed.), (1992). The future of Nontraditional/Interdisciplinary Programs: Margin or mainstream? *Selected Papers from the Tenth Annual Conference on Nontraditional and Interdisciplinary Programs, Virginia Beach, VA,* 1-763.

Schmidt, H. G., Henny, P. A., & de Vries, M. (1992). Comparing problem-based with conventional education: A review of the University of Limburg medical school experiment. *Annals of Community-Oriented Education,* 5, 193-198.

Shapira, P. 1998. Manufacturing extension: Performance, challenges and policy issues. In *Investing in Innovation*, eds. L. Branscomb and J. Keller, 250-275. Cambridge, Mass.: MIT Press.

Speer, T.L. 1996. A nation of students. *American Demographics*, August, 32-45.

Stowers, G. 1999. Symposium on Internet-mediated learning in public affairs; Introduction. *Journal of Public Affairs Education* 5(3): 205-212.

Thornton, C. 1999. Back to school, Web style. *PC World*, July, 39-40.

Vernon, D.T. & Blake, R.L. (1993). Does problem-based learning work? A meta-analysis of evaluative research. *Academic Medicine,* 68(7) 550-563.

Vernon, D.T. (1995). Attitudes and opinions of faculty tutors about problem-based learning. *Academic Medicine,* 70(3) 216-223.

Winner, L. 1998. Report from the Digital Diploma Mills Conference. *Science as Culture* 7(1): 369-377.

Credit Management Policies and Practices:
Implications on Cash Flow and Profitability - A Preliminary Study

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ABSTRACT
Managing credit in today's business environment is difficult as well as complicated. Companies are faced with competitive pressures, different customer preferences, and plenty of attractive business opportunities. Most enterprises nowadays offer credit as a business tactic to attract customers. Credit represents a key corporate asset that can be managed to create competitive advantage, particularly in terms of liquidity. This research explores and identifies credit management policies and practices of listed and non-listed companies in Malaysia. The result suggests that credit management policies and practices affect the cash flow and profitability of firms.

INTRODUCTION

Credit is a major force in the global economy and the bulk of inter-firm, domestic and cross-border sales are made on business-to-business (B-to-B) credit terms (Wilson, Wetherhill and Summers, 2000). At the same time, trade credit is a particularly important source of funding for smaller companies, exceeding the use of all other types of financial services except checking (Bitler, Robb and Wolken, 2001). The use of trade credit is most prevalent in manufacturing, construction and tertiary (wholesale and retail) industries where physical capital is relatively high. However, its use is less prevalent in industries where human capital costs are higher.

In both the United Kingdom (UK) and the United States (US), stocks and trade credit flows are typically twice the size of bank credit (Wilner, 1996; Elliehausen and Wolken, 1993). In the UK, it is estimated that more than 80% of daily business-to- business transactions are on credit terms, representing up to 30-35% of total assets (Peel, Wilson and Howorth, 2000). A similar scenario is also found in the US, where 60% of small business surveyed use trade credit (Bradley and Rubach, 2001).

In recent years, a considerable amount of research has been devoted to understanding the function of credit markets, credit market imperfections, the phenomenon of credit rationing and the role of asymmetric information (Wilson, Summers & Singleton, 1997). At the same time, credit policy initiatives have also focused on one element of cash-flow management - the extension of trade credit and the management of trade debtors (Peel, Wilson and Howorth, 2000). However, minimal research has been undertaken on these issues although some research has recently been conducted on the credit management practices of large UK companies (Pike et al, 1998). Researchers have not fully explored the specific effects of credit management policies and practices on the cash flow and profitability of companies.

The purpose of this paper is to explore the credit management policies and practices among public listed and non-listed companies in Malaysia. It argues that sound credit management policies and practices will eventually lead to better cash flow (liquidity) for a company through shortening the payment period of debtors' accounts. Effective credit management would considerably reduce the risk of doubtful and bad debts and avoid or minimize the chance of a financial crisis occurring.

THE NATURE AND THEORETICAL FRAMEWORK OF TRADE CREDIT AND ITS MANAGEMENT

Credit begins with a buyer (a company or individual consumer) deciding to purchase a product or service. The purchaser offers a trading value for acceptance by the seller, but the seller has also to offer value to the purchaser in the form of credit or deferred payment. The purchaser becomes the debtor, or user of credit, while the seller becomes the creditor, or grantor of credit. The purchaser's ability to obtain a product or other Transaction items for example, a loan or service) is usually based on a promise of payment at a later date (The

Credit Research Foundation, 1999).

Trade credit involves supplying goods and services on a deferred payment basis. Here, sellers agree that payment can be made after the delivery of goods and services but before a certain deadline. While allowing buyers to pay at a later date, sellers would normally set certain credit terms for their buyers in order to regulate the extension of credit. Credit terms refer to the written or stated policies to a customer with regard to: the timing of payment; discounts for early settlement; the methods of payment; ownership of goods prior to payment (e.g. retention of title to the goods or other types of security); and (if applicable) interest or penalties for late payment (Peel, Wilson and Howorth, 2000). Payment of business-to-business sales can take many forms and a wide variety of possible payment terms can be offered, such as cash on or before delivery (CoD, CBD) (Wilson, Summers and Singleton, 1997). On the other hand, credit investors may suffer losses when default occurs (McQuown, Kasta, and Sullivan, 1999).

Trade credit is not new and has been around as long as trade itself, as evidenced by a study of 15th century Britain that revealed credit accounted for more than half of all transactions (Bennett, 1989). Other authors have also made similar findings in this century (Mian and Smith, 1992; Peel, Wilson and Howorth, 2000). Trade credit is an important source of funding for small business (Mian and Smith, 1992). It is also a competitive tool which can create new business, build stronger supplier-customer relations, signal product quality, financial health, and image, differentiate products and services (Peel, Wilson and Howorth, 2000), boost profits through additional sales, match the terms of sales of the competition, and as a part of a promotional effort (National Association of Credit Management of USA, 1998). Firms may also extend credit in an attempt to differentiate their own product or financial offering from their competitors' and/or use trade credit periods as a signal to the market of high and consistent product quality and/or long-term presence in the market (Crawford, 1992).

Past studies concentrated on several aspects of credit. These studies include solving the problem of customer selection that is associated primarily with the aspect of bad debts (Bierman and Hausman, 1970; Mehta, 1968; Greer, 1976), monitoring and forecasting aspects of accounts receivable (Lewellen and Edmister, 1973; Benishay, 1966), accounts receivable (Beranek, 1963), the role of accounts receivable in promotional strategy (Peterson, 1969), short-term financial planning (Orgler, 1969), packages of credit terms (Merville and Tavis, 1973) and an integrated model for accounts receivable management (Lieber and Orgler, 1975). But so far no attempt has been made to study the impact of credit management policies and practices on the cash flow and profitability of firms.

RESEARCH METHODOLOGY

The population of this study consists of companies in Malaysia. A sample of 100 companies was selected on the basis of ease of access and responsiveness. The study was done by a two-stage approach. The first stage involved the scrutiny of the financial statements of 50 of the companies for the year 2000 or 2001 and the assessment of their revenue, expenses (including provision for doubtful and bad debts), financial ratios, and the opening and closing balance of their accounts receivable. This is described in the following accounting equations:

[Rev - Exp(after Debts) = PBIT + Debts = Adjusted PBIT]; and

[OBAL AR + Revenue – CBAL AR (after Debts) = Total Cash Flow – Debts = Adjusted Cash Flow].

The analysis of the financial statements provided answers to the question of the implications of credit management to profitability, cash flow, and ratios.

The second stage consisted of the distribution of a questionnaire to the other 50 companies. Only 27 or 54% of them responded, which is an acceptable rate. The questionnaire was designed on the basis of the findings in the initial study of the financial statements of the 50 companies selected in the first stage of the study. The questionnaire was used to determine policies and practices in connection with credit management. The questionnaires were mailed to the CEOs of the companies selected from the telephone directory. The questionnaire included four sections: general information about the companies, questions with regard to their credit policies, their practices, and the implications.

Data from the financial statements were processed by noting the factors indicated earlier, and analyzed by selecting certain elements in the financial statement that would have an implication on profit and cash flow, e.g. revenue, provision for doubtful and bad debts, financial ratios, opening and closing balance of accounts receivable. Frequency and Cross-tabulation method was used to analyze data from the questionnaire.

FINDINGS

The findings of this research are derived from data collected from the completed questionnaires submitted by the respondents from the 50 selected companies as well as financial data extracted from the audited financial statements of the other set of 50 companies. The first part of the findings highlights the implications of credit management policies and practices on the cash flow and profitability of the companies concerned. The second part shows the results of the questionnaire survey.

Credit management and its implications on firms' profitability

Using the first part of the above accounting equation, a clear relationship between a company's credit management policies and practices and its profitability can be established. From the examination, it was discovered that out of the 50 selected companies, 36 or 72% of them have been adversely affected by the provision for doubtful and bad debts. The overall total profit of these companies adversely affected by doubtful and bad debts amounted to RM150,851,000 or 23% of the companies' overall total profit for the period under review. And of these 36 companies negatively affected by the provision for doubtful and bad debts, nine of them are seriously affected involving a total of RM135,106,000 in terms of accounting profit. Table 1 shows the details.

Table 1: Summary of Effect of Credit Management on Companies' Profit

Variables	RM ('000)
Revenues	15,007,355
Less: Expenses	(14,502,712)
Net Profit/(Loss)	504,643
(After current year provision for doubtful & bad debts)	
Add back: Current year provision for doubtful & bad debts	150,851
Adjusted Net Profit/(Loss) before current year provision for doubtful & bad debts	655,494
Proportion of current year provision for doubtful and bad debts to Net Profit/(Loss) before doubtful and bad debts	23%

Credit management and its implications on firms' cash flow

Using the second accounting equation, out of the 50 audited financial statements analyzed, 72% (36) of the companies were adversely affected by the provision for doubtful and bad debts, as reflected by a higher cash inflow by RM150,851,000 for the period when the overall cash inflow for the period should actually be less by the same amount. However, companies would generally experience higher cash inflow if they are able to reduce the closing balance of their receivables at year end, with or without the provision for doubtful and bad debts. Refer to Table 2 for details.

Table 2: Summary of Effect of Credit Management on Companies' Cash Flow

Variables	RM ('000)
OBAL of Accounts Receivable	64,058,223
Add: Revenues	15,007,355
Less: CBAL of Accounts Receivable	(72,200,537)
(After provision for doubtful and bad debts)	
Total Cash Inflow for the year after provision for doubtful & bad debts	6,865,041
Less: Current year provision for doubtful & bad debts	(150,851)
Revised Total Cash Inflow for the year if no provision for doubtful and bad debts	6,714,190

Assessing Credit Performance Based on Financial Ratios Analysis

A further analysis was carried out on the annual reports of 20 companies. The examination of the reports based on financial ratios revealed that the mean deferred period of creditor payables was 162 days, with only seven of them settling their account with suppliers within 60 days. In addition, the examination of the companies' inventory carrying period (ICP) indicated that the average (ICP) was 77 days. Subsequently, the ratio also revealed that the overall mean collection period (ACP) for the companies was 268 days and most companies (75%) experienced Days Sales Outstanding (DSO) exceeding 100 days. Out of these companies, only one of them managed to keep their ACPs below one month or 30 days.

From the cash conversion cycle (CCC) perspective, the study shows that the mean CCC for the companies was 183 days indicating that most of them prolonged payment to their suppliers up to 6 months. Refer to Table 3 for

details.

Table 3: Measuring Credit Management Effectiveness Based on Selected Ratios

Variables	Day(s)
Mean Debtors Collection Period	268
Mean Creditors Payment Period	162
Mean Inventory Carrying Period	77
Mean Cash Conversion Cycle	183

Assessing firms' external borrowing in relation to account receivables

For this purpose, companies with external borrowing elements in the year 2000 were extracted and analyzed. Only 10 companies indicated some elements of external borrowings in their financial statements. From Table 4 below, 23% of the companies' total sales were not paid. The companies' current liabilities and external borrowings amounted to RM1,541, 425 or 51% of current revenues, creating an extra financial cost of 2.23% of total sales.

Table 4: High Level of Account Receivables Leads to External Borrowings to Fund Operations

Variables	RM('000)
Sales	2,993,500
Account Receivables at end of financial year	690,072
Current Liabilities (excluding borrowings)	781,363
Cash and Bank Balances	47,123
External Borrowings	760,062
Finance Costs	66,782

Policies and practices of credit management among companies

From the 50 questionnaires distributed to various companies in Malaysia, 27 of them responded. The results of the survey are depicted in Table 5 below.

Table 5: Policies and Practices of Credit Management

Type of policies and practices	Frequency	Percentage
Specific personnel handling credit function in the company;		
• We have specific credit personnel	16	59
• We don't have specific credit personnel	11	41
Department responsible for credit function;		
• Finance Department	12	44
• Marketing Department	5	19
• Other Department	10	37
Conducting credit investigation before granting credit to new customers;		
• Yes	15	56
• No	12	44
Forms of credit investigation;		
• Asking customers to complete Credit Application form	10	37
• Carrying out analysis on customers' creditworthiness	15	56
• Asking references from banks or other industry groups	6	22
Tasks to perform when offering credit;		
• Evaluate the customers' credit status regularly	16	59
• Define and set credit limits with customers	16	59
• Define and set payment terms with customers	23	85
• Accuracy of invoicing and prompt issuance	25	93
• Confirm the accuracy of the outstanding accounts	21	78
• Confirm in writing all important points being discussed and agreed.	9	33
• Follow up on all outstanding accounts	25	93
• Match payment receipts against specific invoice	23	85
• Offer a further cash discount if payment is made within the credit terms	5	19
Modes and terms of payment the company normally use;		
• Cash Before Delivery	4	15

• Cash on Delivery	2	7
• Letter of Credit	2	7
• 50% upfront payment	3	11
• Credit term minimum 30 day	24	89
Percentage of total sales made in credit;		
• 50%	4	15
• 51-60%	-	-
• 61-70%	1	4
• 71-80%	-	-
• 81-90%	2	7
• Above 90%	20	74
Impose penalty for late payment;		
• Agreed	12	44
• Disagreed	15	56
Take legal action if customers do not bother to pay their outstanding accounts;		
• For legal action	25	93
• Against pursuing legal action	2	7

Table 6: Implications of Credit Management Policies and Practices

Details	Frequency	Percentage
Customers' paying pattern;		
• All paid within trading terms	15	56
• Majority paid within trading terms	11	40
• Majority paid outside trading terms	1	4
• All paid outside trading terms	-	0
Common excuses made when it comes to collection;		
• No Money	8	30
• Your payment is in process	24	89
• Waiting for somebody to pay us	19	70
• Your bills were not received	11	41
• The goods or services have been incorrectly accounted for	2	7
• The boss is out of town	11	41
Did your company suffer from provision for doubtful and bad debts;		
• Yes	17	63
• No	10	37
Poor debt collection adversely affect a company's ability to grow;		
• Strong agree	10	37
• Agree	16	59
• Neither agree or disagree	1	4
• Disagree	-	-
• Strongly disagree	-	-

Table 7: Perception on Effective Credit Management Policies and Practices

Criteria	Frequency
Called and visited the customers regularly	25
Recognised the early signal of potential bad debts	25
Established credit policy and objective	24
Sent letters of reminders and statement of account on month basis	23
Payment terms imposed on all credit sales	22
Credit investigations conducted by obtaining additional credit information from banks, and other trade references	18
Used of credit application forms	17
Automated credit activities	13
Motivated credit personnel	9
Offer of a further cash discount if payment is made within the specified credit terms	5
Used collection agency	3
Liaised with other strategic business units (SBU) such as Marketing & Operation and Finance departments	0

DISCUSSION OF FINDINGS

In today's intensely competitive marketplace, pressure on profit margins and high default rates require a complete understanding of the effects of credit losses on an organisation (Yatsko & Scheer, 2003). However, little empirical research has directly examined the factors that determine the implications of credit management policies and practices on the cash flow and profitability of firms. This study has attempted to fill this gap in the literature, focusing on the impact of credit policies and practices on firms' financial performance.

From the results of the survey of companies in Malaysia, it is clear that the credit management policies and practices of companies have a direct impact on their cash flow and bottom line. An examination of the audited financial statements of 50 companies, as well as from the feedback of our questionnaire respondents, confirmed that almost all of them suffered from the provision for doubtful and bad debts. This finding is consistent with various studies made by previous researchers (e.g., Wilner, 1996; Ellienhausen & Worlken, 1993; Mian & Smith, 1992; Borgman & Ford, 1998).

From this study, it is noted that the greatest impact of the provision for doubtful and bad debts is on the account receivable, created through credit sales. This is to be expected because most companies indicated that a large percentage (i.e. above 90%) of their sales or turnover were transacted on credit. At the same time, 97% of the respondents indicated that poor debt collection adversely affected their companies ability to grow. Previous authors have made it clear that when debtors default on their payment, credit investors would suffer losses (McQuown, Kasta and Sullivan (1999). Hence, it can be argued that the provision made for doubtful and bad debts arising from poor credit management of a company leads to foreseeable non-receipt of payments in its outstanding accounts. This is a direct or up-front deduction of the company's rightful profit. Consequently, a company that has already suffered losses even before the provision would eventually suffer a bigger loss. Therefore, it should be recognized that doubtful and bad debts could have a serious impact on a firm's profit.

The study has also shown that debtors have used various excuses when it comes to paying their suppliers. The most prevalent one is *"Your payment is in process"* (89%). Therefore, a delay of almost 270 days, for instance, before companies receive payment or cash from their customers would certainly jeopardize their abilities to take advantage of other business opportunities or promotions. Inability to pay their suppliers on time could also affect their future relationship. As indicated in Table 4, another interesting factor discovered in this research is that companies with high non-payable receivables also experienced a high level of current liabilities and external borrowings. Therefore, this suggests that companies which fail to collect their outstanding accounts promptly would have to find external funds to fund their operational obligations resulting in additional financial costs.

Therefore, sound credit management policies and practices would minimize the level to be provided for doubtful and bad debts. Likewise, poor credit management, arising from not having proper credit strategies in place, such as no proper trade and cash discounts structure, no proper follow-up strategies on overdue accounts, no effective system to monitor customers etc., would certainly necessitate a higher provision to be made for doubtful and bad debts in receivable accounts.

CONCLUSION

This paper sets out to clarify the implications of credit management policies and practices on the cash flow and bottom line of companies. Based on the findings of previous studies and of this study, it can be concluded that companies generally have not taken a serious approach in managing their credit activities. High debtors ratio to current assets results in a low cash flow level necessitating companies to borrow externally. Such a remedy leads to additional financial costs, profit squeeze and heavy debt burdens that contribute to business failure (Neophytou, Charitou & Charalambous, 2000).

The research suggests that for a company to survive in a competitive age, putting credit functions in a proper perspective is highly recommended. This includes making credit work smoothly as well as thinking ahead and building credit uncertainty or risk into margin. In addition, the ability to recognize the early signals of potential bad debts and making calls, sending reminders and statements of account and regular visits to customers are the least most companies must do.

Implications to Academics and Managers

Efficient credit and financial management have been stressed as being critical to the health and prosperity of

firms in the UK (Peel, Wilson & Howorth, 2000). However, there is little empirical evidence on credit management of companies in Malaysia. Malaysian academics should start considering credit research as an important branch of financial management research.

As for practitioners, this preliminary research should remind them of the importance of managing their credit activities effectively and efficiently at all times. Managers should understand that failure to properly manage the biggest portion of their companies' current assets, i.e. receivables, would increase the financial risk and distress of their firms and may result in corporate failure (Sori, Mohamad, Hamid & Nassir, 2002). Most respondents in this study do not place sufficient importance on necessary systemic improvements, such as automating credit activities, having properly trained and motivated credit personnel, use of cash discount structure, outsourcing of collection of outstanding accounts to collection agencies, and effective collaboration with other business units of their company. They should seriously consider these strategic actions to create competitive advantage for their companies in the present highly competitive business environment.

Limitations

n this study, no intention has been made to fully explore the credit management policies and practices in Malaysia utilizing a large sampling population taken from a specific industry. This research employed only a convenient sampling method that obtained data from selected sources. This form of data collection limits the generalizability of such findings. Therefore the findings in this paper must be looked at in conjunction with data from other studies in this specific area before any generalizations can be made. At the same time, in this study we employed largely accounting principles in our data analysis and ignored other methods of analysis.

The Way Forward

Future research needs to address the issues in relation to the predictability of firms' failure due to ineffective credit management. This can be enhanced using appropriate predicting models. Future research should also focus on specific industries, with a reasonable population size, as different industries would apply different credit policies and practices to minimize financial risks.

REFERENCES

Benishay, H. (1966). A stochastic Model of Credit Sales Debt, American Statistical Association Journal: pp.1010-1028

Bennett, E.Z. (1989). Debt and credit in the urban economy: London 1380-1460, PhD Thesis, University of Yale

Beranek, W. (1963). Analysis for Financial Decisions, Richard D. Irwin, Inc., Homewood, Illinoise: Chapter 10.

Bierman, H.,Jr. and Hausman, W. H. (1970). The Credit Granting Decision, Management Science: pp.519-532

Bitler, M.P., Robb, A.M., & Wolken, J.D. (2001). Financial services used by small businesses: I Evidence from the 1999 survey of small business finance. Federal Reserve Bulletin 8794): 183-205

Borgman, R.H. & Ford, J.K. (1998). Managing concentration risk in receivable, Volume 4, Number 2, Second Quarter 2000, The Credit and Financial Management Review

Bradley, D.B., III & Rubach, M.L. (2001). Is uniqueness enough? An examination of the services of independent pharmacies. Journal of Business and Entrepreneurship. 13(1):11-127

Crawford, P. (1992). A survey of the trade credit literature, University of Bristol DP No. 92/324

Credit and accounts receivable compensation study (1999). Credit Research Foundation

Elliehausen G.E and Wolken J.D. (1993). The Demand for Trade Credit: An investigation of motives for trade credit use by Small Businesses, Federal Reserve Bulletin, Paper 165

Greer, C.C. (1967). The Optimal Credit Acceptance Policy, Journal of Financial and Quantitative Analysis: pp. 399-415.

Lewellen.W.G. and Edminster, R.O. (1973). A General Model for Accounts Receivable Analysis and Control, Journal of Financial and Quantatitive Analysis: pp.195-206

Lieber, Z. and Orgler, Y. E. (1975). An integrated model for accounts receivable management: Management Science, Vol. 22, No.1

McQuown, J.A., Kasta, T., & Sullivan,G. (1999). EDF ™ credit measure-A market-based measure of default risk, Volume 5, Number 2, Second Quarter, The Credit and Financial Management Review

Mehta. D. (1968), The Formulation of Credit Policy Models, Management Science: pp.30-50.

Merville, L.J. and Tavis, L.A. (1973). Optimal Working Capital Policies: A change-constrained programming approach, Journal of Financial and Quantitative Analysis: pp.47-59.

Mian, S.L., Smith, C.W. Jnr (1992). Account receivable management policy: Theory and evidence, Journal of Finance, Volume 67, Number 1, 169-200

Neophytou, E., Charitou, A., & Charalambous, C. (2000). Predicting Corporate Failure: Empirical Evidence for the UK

Orgler, Y.E. (1969). An Unequal Period Model for Cash Management Decisions, Management Science: pp.B77-92.

Peel, M.J, Wilson, N., & I Howorth, C. (2000). Late payment and credit management in the small firm sector: Some empirical evidence. International Small Business Journal 18(2):17-37

Peterson, D. E. (1969). A Quantitative Framework for Financial Management, Richard D. Irwin. Inc., Homewood, Illinois: Chapter 10.

Pike, R., Cheng, N., and Chadwick, L. (1998). Managing Trade Credit for competitive advantage. CIMA Publishing

Sori, Z.M., Mohamad, S., Hamid, M.A.A.,& Nasir, A.Md. (2002). Determinants of corporate success and failure: The Malaysian Case, Akauntan Nasional, The Journal of the Malaysian Institute of Accountants, Volume 15-Number 2

Wilner, B.S. (1996). Paying your bills: An empirical study of trade credit, Working paper, University of Michigan, Ann Arbor

Wilson, N., Singleton, C. & Summers, B. (1997). The demand for trade credit, credit rationing and the late payment of commercial debt: An empirical study of growing businesses, Babson/Kauffman Entrepreneurship Research Conference, Babson College, Boston USA

Wilson, N., Wetherhill, P., & Summers, B. (2000). Business-to-Business Credit: A strategic tool for new economy. The Credit Management Quarterly Review

Yatsko, D. & Scherr, F. (2003). Replacing defaulted customers: The hidden cost of default, Volume 9, Number 3, Third Quarter, The Credit and Financial Management Review

Determinants Of Firm Performance: Evidence From Industrial Products And Trading/Services Firms

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ABSTRACT

This study empirically examines the relationship between firm performance and traditional firm determinants (i.e. size, growth opportunities, leverage, beta, and industry). Additionally, a new determinant, which is the chief executive officer (CEO)/Managing Director ethnicity is introduced into the model. Data comprising of 100 Malaysian listed main board firms from two main sectors (i.e. Industrial Products and Trading/Services) during the financial year 2000 to 2002 are used to empirically test the research model. The findings of this study indicate that growth opportunities is positively related to firm performance. However, in line with previous empirical evidence, beta (systematic risk) and leverage are negatively related to firm performance, while firm size does not influence firm performance. Lastly, firms with foreign CEO's were found to outperform those with Chinese ownership. In terms of industry, Trading/Services' firms have significantly superior performance in comparison to Industrial Products' firms.

INTRODUCTION

In this study, the factors that determine firm performance would be investigated from a slightly different perspective. In previous studies, firm performance has been measured using return on assets (Shariff, 2002; Taridi, 1999; Yap, 2001) Tobin's Q or just Q, in short (Nor, Said and Redzuan, 1999), price-earnings ratio (Nor et al., 1999) and Economic Value Added (Isa and Kam, 2001). Chung and Pruitt (1994) added that Tobin's Q could be used to measure firm performance or growth opportunities. While taking into account the said traditional factors that were previously found to influence firm performance (e.g. firm size, beta, leverage, growth and industry effect), this study also seeks to explore empirically the impact of Chief Executive Officer or Managing Director ethnicity on firm performance. This is unique because in a multi-cultural country like Malaysia, there is considerable variation in terms of CEO ethnic groupings (i.e. Bumiputera, Chinese, Indian and foreigners), which may have an influence on firm performance. It is noteworthy that there are only a few Indian CEO's in this data set. Nevertheless, this reflects the Indian-Malaysian ethnic composition where, Indians comprise of is still interesting to see if it affects firm performance.

The remaining sections of the paper are organized as follows: Section two presents a model development on firm performance is proposed. Following that, the next section describes the data and research methodology, while section four reports the results of the statistical analyses. Finally, section five summarizes the main conclusions of this study.

MODEL DEVELOPMENT

There have been numerous studies on Malaysian firm performance, in particular those (e.g. Ali & Sanda, 2001; Nor et al., 1999; Shariff, 2002; Yap, 2001; Yeboah-Duah, 1993) that examined the relationship between ownership structure and firm performance. Similarly in Indonesia, Taridi (1999) examined the ownership structure; focusing on the aspects of ownership concentration and firm performance. In similar vein, Demsetz and Villalonga (2001) had shared the same platform with data from the United States. There are also studies (e.g. Dawson, 1987; Ku Nor, Abidin & Zainudin, 1993; Yong, 1991) that link firm performance to initial public offerings in Malaysia. Additionally, there are others (e.g. Johnson & Mitton, 2003) who examine the relationship between politically connected firms and firm performance. "Politically connected firms" is defined as firms that have an identifiable connection with key government officials (Gomez & Jomo, 1997).

Broadly, firm performance can be categorized into two main measures: 1) accounting profit rate (e.g. return on equity, return on assets, profit before tax) (Boardman et al, 1997; Chee & Hooy, 2003; Demsetz & Lehn, 1985; Johnson & Mitton, 2003) and 2) Tobin's Q (Chung & Pruitt, 1994; Nor et al. 1999). The difference between the

two measures is that the former is "backward-looking" in terms of time perspective whereas Q is "forward-looking". Additionally, Demsetz and Villalonga (2001) added that accounting profit rate is constrained by accounting standards set by the accounting profession/law in Malaysia while Q is more affected by the "psychology of investors".

Size of the firm plays a major role in firm performance. Being larger, firms are able to reap economies of scale and hence may have opportunities for cost reduction that in turn increases the firm's profitability. As a result, larger firms may have more potential to be profitable than smaller firms. However, the empirical evidences remain inconclusive regarding the said outcome. Studies that detect a positive relationship between firm performance and size include Boardman, Shapiro and Vining (2001), Isa and Kam (2001), Shariff (2002) and Taridi (1999). In contrast, Chee and Hooy (2003) found a negative relationship between firm performance and size. Other studies (e.g. Boardman et al., 1997; Johnson & Mitton, 2003) found no significant relationship between performance and firm size.

Leverage indicates the capital structure of the firm. The higher the leverage (i.e. the more the debt relative to other sources of capital), the greater the firm risk. Greater risk is associated with higher profit, while leading an increase in bankruptcy risk. Taridi (1999) and Wiwattanakantang, (2001) discovered a negative relationship between leverage and firm performance using American and Indonesian data respectively. In Malaysia, Johnson and Mitton (2003) found that there is no significant relationship between leverage and firm performance. Apart from Leverage, another measure of firm risk is Beta, which slightly differes from leverage in that it is a measure of market risk.

With regards to success measures, growth or growth opportunities have been found to have an impact on firm performance. Previous researchers (Shariff, 2002; Taridi, 1999; Wiwattanakantang; 2001) have generally found that growth has a positive relationship with firm performance. However, Johnson and Mitton (2003) found that there are no significant relationship between growth opportunities and firm performance. In terms of previous studies who considered the effect of different types of industries on form performance, Taridi (1999) discovered that that are industry differences in firm performance, while Chee and Hooy (2003) believed otherwise. Both researches were carried out in Indonesia and Malaysia, respectively.

From the perspective of ownership ethnicity and firm performance, there are researchers (Haniffa & Cooke ,2002) who investigated the link between Chief Executive Officer (CEO) ethnicity and corporate disclosure, while others (e.g. Agrawal and Knoeber, 1996) studied the impact of CEO's specific human capital (as measured by number of years CEO has worked with the firm) and firm performance. Similarly, this study seeks to establish a link between CEO/Managing Director or Chairman of the Board of Directors' ethnicity and firm performance. In Malaysia, the role of CEO ethnicity is unique due to its multi-cultural ethnic population and composition in locally listed firms, which comprise of CEOs who are Bumiputeras, Chinese, Indians and others (foreigners). In Canada, Boardman et al. (1997) found that foreign multi-national enterprises (or foreign CEO controlled firms) had superior performance (as measured by return on assets) when compared with the local firms in Canada.

DATA AND METHODOLOGY

In this study, data on all firms listed on Bursa Malaysia (previously Kuala Lumpur Stock Exchange) for the period from 2000 to 2002 were used. The selection of the study period from 2000-02 as this study utilizes a more stable economic environment post-financial crisis in 1997. This study focuses on the Industrial Products and Trading/Services firms as these firms form the bulk of listed firms on Bursa Malaysia's Main Board firms. Finance sector firms were also dropped owing regulations imposed on these firms which result in non-comparability with non-financial firms. The other selection criteria for the sample firms are that firms with zero sales and negative shareholders' equity were excluded as this distorts the calculation of certain variables like debt-equity ratio which is used in this study. Companies that change their financial year have been included but their data is annualized. In the case where the financial year of samples extend more than 12 months, the data is first annualized and then the missing data is substituted with the mean value. Hence, the number of Main Board Industrial Products and Trading/Services firms that satisfy the above selection criteria is 100 firms. However, the remove of several outliers, did not result in a reduction in the number of sample firms but only data points were reduced. The 100 sample firms used in this study represent 17.8% (out of a total of 562 firms) of the Main Board firms listed on Bursa Malaysia as at end of 2002.

Model:

Briefly, the dependent variable is return on equity (ROE) and the independent variables consist of six independent variables consisting of size (represented by sales), beta (measure of systematic/non-diversifiable risk i.e. variability of the security's return resulting from variations in the general market), debt-equity ratio (capital structure), growth opportunities (Tobin's Q), industry (dummy variable) and chief executive officer/managing director/executive chairman ethnicity (dummy). Ordinary least square regression is used to test the model below:

The multiple regression equation model for this study is as follows:

$$ROE_{it} = \alpha_0 + \beta_1 Q_{it} + \beta_2 SALES_{it} + \beta_3 BETA_{it} + \beta_4 DE_{it} + \beta_5 CEO_{it} + \beta_6 IND_{it} + \varepsilon_{it}$$

Return on equity (ROE), a measure of firm performance is the dependent variable. Independent variables include growth opportunities (Q), sales (SALES), unsystematic risk (BETA), debt-equity ratio (DE), Chief Executive Officer/Managing Director/Executive Chairman ethnicity (CEO), and industry dummy (IND). Return on equity is measured by profit before tax scaled by shareholders' equity. Growth opportunities (Q) is measured by the sum of the market value of equity plus book value of long term debt and net current assets divided by total assets as defined by Chung and Pruitt (1994). This is because the replacement value of assets data as used in the original Tobin Q calculation is not available in the Malaysian context and Chung and Pruitt (1994) have used the above approximation to calculate Tobin's Q. Sales is a measure of firm size. Beta is calculated using the adjusted (to take into account capitalization changes) weekly share price for the year.

ANALYSES AND FINDINGS

From Table 1 below, for year 2000-2002, the mean return on equity of -2.5% for Industrial Products and Trading/Services firms on Bursa Malaysia is perceived to be low. This is possibly due to the recovery phase after the adverse effects of the 1997 Asian financial crisis. In terms of Tobin's Q, averaging 0.63 for the same period under study, this can be considered low implying low growth opportunities. With a mean beta of 1.1, the firms' systematic risk has moved more or less in tandem with the market. In addition, with mean debt-equity ratio of 1.2, firms can be said to have high leverage.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROE	300	-4.890	.630	-.02539	.517280
Q	300	-1.224	3.793	.63403	.524387
SALES	300	499	15375100	1235856.41	2421193.480
BETA	300	-.5437	2.895	1.142	.584
DE	300	.000	34.961	1.212	3.136
N	300				

In Table 2 below, Pearson's product moment correlation is used to identify the extent of the data points in one variable that occupies a relative position in another. This concept which build on the covariance is useful in providing an exploratory feel before multiple regression is conducted. Additionally, the Pearson's *r* provided sufficient predictive validity for this study's model except for sales.

Table 2: Pearson's Correlation Matrix

	ROE	Q	SALES	BETA	DE
ROE	1.000				
Q	.273**	1.000			
SALES	.092	.152**	1.000		
BETA	-.209**	-.313**	-.051	1.000	
DE	-.645**	-.259**	.035	.134*	1.000

Note: ** Correlation is significant at $p < .01$ level (2-tailed)
     * Correlation is significant at $p < .05$ level (2-tailed)

The findings (please see Table 3) suggest that trading/services' firms perform better than Industrial Product firms. There is a significant positive relationship between growth opportunities (Q) and firm performance as in
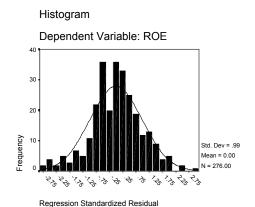
Shariff (2002), and Taridi (1999). Firm size, as measured by sales, is not significantly related to firm performance. This finding concurs with the findings of Johnson and Mitton (2003) but differs from the findings of Shariff (2002), who detected a positive relationship between sales and firm performance. With regards to leverage and beta, both were found to be negatively related to firm performance. This is in line with studies conducted by Shariff (2002) and Taridi (1999). With regards to firm performance, only firms with foreign CEOs differed with respect to their Chinese counterparts, while there are no statistical differences between firms with Bumiputera, Chinese and Indian CEOs with those led by Chinese ownership.

Table 3: Multiple Regression Results

Model	Unstandardized Coefficients		Standardized Coefficients
	β	Std. Error	β
(Constant)	.118	.023	
Q	.041	.016	.132*
SALES	5.523E-09	.000	.084
BETA	-.074	.014	-.261*
DE	-.072	.007	-.497*
IND	.071	.016	.217*
Bumi	-.011	.017	-.031
Indian	.018	.123	.006
Foreigner	.054	.033	.075[B]
R^2	.46		
Durbin Watson	1.663		

Note: dependent variable ROE
** significant at $p < 0.01$ level
* significant at $p < 0.05$ level
[B] significant at $p < 0.1$ level

It is important to note that the model have gone through a series of refinement to meet the classical statistical assumptions. A series of case wise diagnostics were carried out with 24 cases (financial year) being excluded from the final model. The initial diagrams (i.e. histogram, p-p plot and scatter plot) can be compared with those having the outliers removed (see figure 1, 2, and 3). The final model was checked to verify the existence of any violations towards the assumptions of multiple regression analyses. However, no statistical breach was found. Multicollinearity (condition index > 30, VIF < 10, tolerance > 0.1) and independence of error term (Durbin Watson between 1.5 – 2.5) were found to be within the acceptable limit. Homoscedasticity was confirmed by plotting the regression standardized residual vs. regression standardized predicted values with the scatter plot not showing significant patterns. The normality assumption was verified too from the p-p plot indicating that all the residuals were located approximately along the diagonal line.

Figure 1: Initial Histogram with 300 Cases
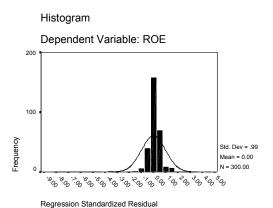
Figure 2: Histogram with 24 Outliers Removed

Figure 3: Initial P-P Plot with 300 Cases

Figure 4: P-P Plot with 24 Outliers Removed
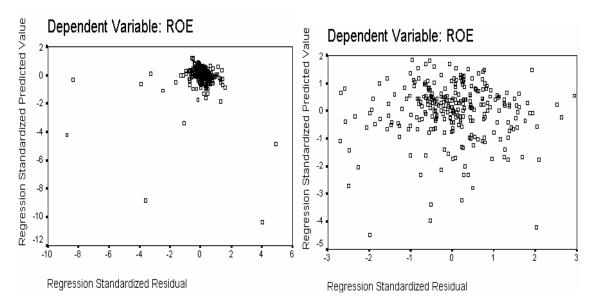
Figure 5: Initial Scatter Plot With 300 Cases

Figure 6: Scatter Plot with 24 Outliers Removed

DISCUSSIONS AND CONCLUSION

This study empirically examines the relationship between firm performance and traditional firm determinants (like size, growth opportunities, leverage, beta, and industry) and a new determinant like chief executive officer (CEO)/Managing Director ethnicity. Data from 100 Malaysian listed Main Board firms from the Industrial Products and Trading/services sectors for year 2000 through 2002 is used in this study. The findings of this study indicate that growth opportunities is positively related to firm performance. However, in line with previous empirical evidence, beta (systematic risk) and leverage are negatively related to firm performance. Firm size does not influence firm performance. However, firm performance was found to be greater for firms with foreign CEOs as compared to Chinese CEOs. Additionally, Trading/Services' firms have significantly superior performance when compared with Industrial Products' firms.

There are several limitations in this study. First, the data set is limited to three years. A better longer period of the study may be better. Second, there are only a limited number of Indian CEOs and this may to some extent distort the results of this study. Third, the 2000-2003 period involves a period of economic recovery and reasonably stable economic environment. It would be more interesting had this study cover a period of economic slowdown which would then indicate the robustness of this study.

REFERENCES

Agrawal, A. and Knoeber, C.R. (1996). Firm performance and mechanisms to control agency problems between managers and shareholders, *Journal of Financial and Quantitative Analysis*, 31(3), 377-397.

Ali, R. and Sanda, A.U. (2001), Further evidence on the relationship between insider stock ownership and firm performance in Malaysia, *Proceedings of the Third Malaysian Finance Association Symposium*, 24[th]May 2001, International Islamic University Malaysia, Kuala Lumpur, 166-189.

Boardman, A.E., Shapiro, D.M. and Vining, A.R. (1997). The role of agency costs in explaining the superior performance of foreign MNE subsidiaries, *International Business Review*, 6 (3), 295-317.

Chee, H.K. and Hooy, C.W. (2003). Firm performance of Malaysian listed companies: A revisit after the recent Asian financial crisis, *Proceedings of the Fifth Asian Academy of Management Conference 2003*, Second Volume, Kuantan, 745-752.

Chung, K.H. and Pruitt, S.W. (1994). A simple approximation of Tobin's Q. *Financial Management*, 23, 70-74.

Dawson, S.M. (1987). Secondary stock performance of initial public offers in Hong Kong, Singapore and Malaysia: 1978-1984, *Journal of Business Finance and Accounting*, 14, 65-76.

Demsetz, H. and Lehn, K. (1985). The structure of corporate ownership: Causes and consequences, *Journal of Political Economy*, 93, 1155-1177.

Demsetz, H. and Villalonga, B. (2001). Ownership structure and corporate performance, *Journal of Corporate Finance*, 7, 209-233.

Gomez, E.T. and Jomo, K.S. (1997). *Malaysia's Political Economy: Politics, Patronage and Profits*, Cambridge University Press.

Haniffa, R.M. and Cooke, T.E. (2002). Culture, corporate governance and disclosure in Malaysian corporations. *Abacus*, 38, 317-349.

Isa, M. M. and Kam, J.K. (2001). Capital structure and financial performance among listed Malaysian companies, *Proceedings of the Third Malaysian Finance Association Symposium*, 24[th]May 2001, International Islamic University Malaysia, Kuala Lumpur, 438-459.

Johnson S. and Mitton, T. (2003). Cronyism and capital controls: Evidence from Malaysia, *Journal of Financial Economics*, 6, 351-382.

Ku Nor, I.K.I, Abidin, F.Z. and Zainudin, N. (1993). Performance of new stock issues on the KLSE, *Capital Markets Review*, 1 (1), 81-95.

Nor, F.M., Said, R.M. and Redzuan, H. (1999). Structure of ownership and corporate financial performance: A Malaysian case, *Malaysian Management Review*, December, 44-48.

Shariff, F.M. (2002). Ownership structure and firm performance: Evidence from plantation firms listed on Kuala Lumpur Stock Exchange, *Proceedings of the Fourth Malaysian Finance Association Symposium*, 24[th]May 2001, International Islamic University Malaysia, Kuala Lumpur, 131-143.

Taridi (1999). Corporate governance, ownership concentration and its impact on firms' performance and firms' debt in listed companies in Indonesia. *The Indonesian Quarterly*, 27, 339-355.

Wiwattanakantang, Y. (2001). Controlling shareholders and corporate value: Evidence from Thailand, *Pacific-Basin Finance Journal*, 9, 323-362.

Yap, K.H. (2001). Director ownership and financial performance of listed companies in Malaysia, *Proceedings of the Fourth Malaysian Finance Association Symposium*, 24[th]May 2001, International Islamic University Malaysia, Kuala Lumpur, 461-486.

Yeboah-Duah, K. (1993). Stock ownership and the performance of the firm in Malaysia, *Capital Markets Review*, 1 (2), 83-116.

Yong, O. (1993). Performance of new issues of securities in Malaysia, *Malaysian Accountant*, June, 3-6.

Export-Led Growth Hypothesis in Malaysia: A Revisited

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ABSTRACT

The paper addresses the crucial question of whether export promotes economic performance in Malaysia, from both theoretical and empirical perspectives. Using *bound testing approach* proposed by Pesaran, *et al*. (2001), the estimated coefficients suggested that an increase in exports, gross fixed capital formation and the size of labour force have a positive and significant impact on the rate of economic growth, both in the short- and long run. Conversely, changes in imports have a negative and marginally significant effect on economic prosperity in both periods. In addition, we found that the devaluation of domestic currency has a positive and crucial impact on the term of trade in the short run, but has a negative and statistical significant influence on economic growth in the long run.

INTRODUCTION

In 1941 P.J. Verdoorn argued that an expansion of exports might stimulate specialization in the promotion of exports product, which in turn may boost the productivity level and may cause the general level of skills to rise in the export sector. As a consequence, this may lead to a reallocation of resources from the (relatively) inefficient non-trade sector to the higher productive export sector. This process of specialization will promote to a higher productivity and lead to output growth. This effect is sometimes called Verdoorn's Law[1]. In an open economy, this would suggest that the inclusion of exports and imports in analyzing the growth rate of economic is a must. This is consistent with an influential work by Kaldor (1966), which assumed that output growth would be demand-determined, therefore exogenous. Notably, Dixon and Thirlwall (1975) have put forth a demand-determined growth model, wherein they use the following propositions[2].

Proposition I: The rate of growth of productivity is a function of the rate of growth of output (Verdoorn's law).

Proposition II: The rate of growth of output is driven by the rate of growth of exports.

Proposition III: This growth rate of exports is in turn a function of domestic and foreign prices and the importing countries' income elasticity of demand for these exports.

Empirical works by Feder (1983); Hart (1983); and Ben-David and Loewy (1998) illustrate the close link between export and economic performance for a few countries. Therefore, export-led growth (hereafter ELG) hypothesis generally reflects the relationship between exports and economic growth, in particular, output growth is stimulated by exports. This relationship, however, remains the subject of debate[3].

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[1] For a discussion about the relevance of the Verdoorn's Law, see Mamgain (1999) and Leon-Ledesma (2000).

[2] The preposition was quoted from Mamgain (1999, pp. 303)

[3] For recent empirical work on export-led growth relationship, see Fosu (1990, 1996); Arnade and Vasavada (1995); and Thornton (1996). While, some found constrasting evidence that export is Granger caused by the economic growth (Henriques and Sadorsky, 1996; Al-Yousif, 1999), while others demonstrated that there exists a bi-directional relationship between these variables (Dutt and Ghosh, 1994; Thornton, 1997; Shan and Sun, 1998).

Broadly speaking, the emphasis of the ELG debate is on whether a country is better served by orienting trade policies to export promotion or to import substitution. The neoclassical school, for example, reveals that growth can be achieved by ELG. The success of utilizing export to enhance economic growth in the Asian newly industrializing countries (NICs) – in particular, Hong Kong, Singapore, Korea and Taiwan, and second-generation NICs (Malaysia and Thailand) – may be related to their import-substitution and export-promotion policies, along with macroeconomic policies. As the largest economy in the developing world, China is the latest country to join this group. As contended by Findlay and Watson (1996: pp.4): "China's experience during the 1980s and 1990s tend[s] to support the argument that openness to trade is a mechanism for achieving more rapid and efficient growth and better distribution of domestic resources." The World Bank (1993) admits and stresses that the experiences of these countries can be viewed as a model for development.

In this paper we study whether higher levels of export growth are positively associated with economic development using annually data on the Malaysian economy from 1959 through 2000. The choice of Malaysia is based, in part, on its strategic economic to the ASEAN economies, as well as its embrace of domestic-oriented policies beginning with the liberalisation and deregulation process in the early 1990s and the endogenously-driven growth strategy in the late 1990s and early 2000. Malaysia has been growing very rapidly with a widely held view that such growth is export-led (Al-Yousif, 1999; Reinhardt, 2000). Malaysia is highly dependent on the foreign trade. Any changes in the international markets, either the prices of commodities or international demand, will have a great impact on both exports and economic growth.

Therefore, this study is conducted to investigate the relationship between output and export in the case of Malaysia by using the most recent econometric methodology, bound test proposed by Pesaran, *et al.* (2001). Specifically, we investigate whether higher level of export and import development, human capital development, investment level and exchange rate are significantly and robustly correlated with faster economic improvements. If there exists a relationship between export and economic growth (that is, export growth does lead to the output growth), we can go on to explore what has governed the rate of growth in the past and what will govern how fast we can and will grow in the future. Our specific objectives are as follows: (1) to examine the short run and long run relationship between output and its key determinants; (2) to examine the disequilibrium of both export and growth is sustainable in the long run or just a short-run phenomenon; (3) to suggest some policy implications to monetary authorities to enhance the fundamental of the economy and stimulate long run economic growth with a stable macroeconomic environment.

The remainder of the paper is organized as follows. Section II provides review on the theoretical model of export-led growth. Section III explains the sources of data and the sets up of the econometric methodologies used. Empirical results and discussion are described in Section IV. The final section summarises some conclusions from the results and discusses some implications of the findings.

THEORETICAL MODEL OF EXPORT-LED GROWTH HYPOTHESIS

Basically, our model is formulated based on the studies conducted by Riezman, *et al.* (1996) and Al-Yousif (1999). The identified model is a six-variable model, which hypothesises that economic output (GDP) is a function of exports, imports, gross fixed capital formation, labour force and exchange rate. Notably,

$$GDP_t = f(\overset{+}{EXP_t}, \overset{-}{IMP_t}, \overset{+}{GFCF_t}, \overset{+}{LAB_t}, \overset{+}{ER_t})$$

where
GDP = real GDP
EXP = real exports
IMP = real imports
$GFCF$ = gross fixed capital formation
LAB = Labor force (as measured by total population)
ER = exchange rate (measured as RM/US$)

The sign above the variables demonstrates the anticipated relationship between each explanatory variable with the dependent variable (real GDP), as proposed by a priori. These relationships are hypothesised based on two theories, namely: trade and development theory and the aggregate production function. The international trade and development theory suggests that there exists a positive correlation between economic and export growth. Export expansion is a significant catalyst in improving productivity growth that is, total factor productivity (TFP). Various explanations have been put forward to relate export and TFP growth rates together in developing countries. For example, Balassa (1985) argued that in general, the production of export goods is focused on those sectors of the economic which are already more efficient. Therefore, export expansion helps to concentrate investment in these sectors, which in turn increase the overall total productivity of the economy. Moreover, the

growth of exports has a stimulating effect on total productivity of the economy as a whole through its positive impact on higher rates of capital (Kavoussi, 1984). The theory also recognises that the causality may run from output to export. Lancaster (1980) and Krugman (1984), for example, justify a one-way causality from output to exports. They argue that output growth has a positive impact on productivity growth and improved productivity, while cost reduction in labour and capital are expected to promote exports. Clearly, these arguments lead us to hypothesise that a causal relationship exists from export growth to output growth.

The inclusion of imports is based on the argument of Riezman, *et al*. (1996) that imports are crucial in testing this hypothesis to avoid producing a spurious causality result. They also pointed out that the finding of no cointegration between exports and output may be due to the omitted variable such as imports. Moreover, considering the fact that export externality effects are possibly due to the role of exports in relieving a foreign borrowing constraints (Serletis, 1992), the influence of imports is expected to be significant in the analysis. Besides, increase in imports may reduce the country's international reserves, thereby slowing down the economic growth. Thus, negative relationship between imports and economic growth is hypothesised[4].

In studying the export-led growth hypothesis, many models were adopted. The most common approach taken in the previous studies of the production growth relationship is based on the neoclassical aggregate production function. According to this theory – assuming Hicks-neutral technological change – aggregate growth can be written as the total factor productivity (TFP) growth and the weighted sum of the growth rate of factor inputs. The weights are the elasticities of output with respect to each input (that is, labour and capital), and under competitive conditions will equal their respective factor shares. As the input increases, it will shift the production function to the higher position and hence, increase the total output. As suggested by production function, capital and labour are the main catalysts to increase the production productivity.

Actually, the relationship between output and export growth is not simple and directly related. Price volatility and political intervention, for example, have great impacts in affecting the relationship. As a consequence, exchange rate is included in the model to reflect the price competitiveness in the international markets (Henriques and Sadorsky, 1996) and its indirect influence on economic performance via export channel (Al-Yousif, 1999). Besides, according to the "new growth theory" or neoclassical growth theory, exports in developing countries depend on the world demand for exported goods, and world demand depend on the price of goods and the income of buyers. Thus, the variability of the exchange rate is especially crucial for a small open economy like Malaysia, which is sensitively influenced by the changes in the world prices. This means that exchange rate can be viewed as a mechanism for adjusting the impacts of such external shocks. Indeed, as contended by Henriques and Sadorsky, Canada has had better economic performance than other nations such as United States mainly due to the lower Canadian dollar. It is expected that positive correlation exists between exchange rate (RM/US$) and economic growth. If the Malaysian ringgit depreciates (i.e. RM/US$ increases), then this will raise the competitiveness of the domestic commodities, and hence encourages exports.

METHODOLOGY

Stationarity and Order of Integration

In order to avoid spurious regression, we need to discern the stationarity of the series. By doing so, we ensure the validity of the usual test statistics (t- and F-statistics, and R^2). Stationarity could be achieved by appropriate number of differencing, which is called order of integration. We use Augmented Dickey Fuller (ADF) [Dickey and Fuller, 1979] test to check the stationarity of the variables.

Augmented Dickey Fuller (ADF) Test

Consider the equation

$$\Delta z_t = \beta_1 + \beta_2 t + \delta z_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta z_{t-i} + \varepsilon_t \qquad (1)$$

where z_t = is our variable of interest consists of {GDP_t, EXP_t, IMP_t, $GFCF_t$, LAB_t, ER_t}, Δ is the differencing operator, t is the time trend and ε is the white noise residual of zero mean and constant variance.

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[4] Notice, however, if a nation imports more capital goods than the consumption goods, then the relationship between imports and economic growth may turn to positive sign as the imported capital goods will lead to a higher production or productivity of a nation in the future.

$\{\beta_1, \beta_2, \delta, \alpha_1, ..., \alpha_m\}$ is a set of parameters to be estimated. Both of the null and alternative hypotheses in unit root tests are:

$H_{0:}$ $\delta = 0$ (y_t is non-stationary / a unit root process)

H_1: $\delta < 0$ (y_t is stationary)

The unit root hypothesis of the Dickey-Fuller can be rejected if the t-test statistic is less than the negative of the critical value tabulated. In other words, by the Augmented Dickey Fuller (ADF) test, a unit root exists in the series z_t (implies non-stationary) if the null hypothesis of δ equals zero is not rejected (Gujarati, 1995, pp. 719-720).

Bound Testing Approach

Following Pesaran, *et al.* (2001), we constructed the vector autoregression (VAR) of order p (VAR(p)) for export-led growth function in Malaysia.

$$z_t = \mu + \sum_{i=1}^{p} \beta_i z_{t-i} + \varepsilon_t \qquad (2)$$

where z_t is the vector of both x_t and y_t, where y_t is the dependent variable defined as economic growth (measured by real GDP) and $x_t = [EXP_t, IMP_t, GFCF_t, LAB_t, ER_t]$ is the vector matrix of represents a set of explanatory variables. $\mu = [\mu_y, \mu_x]'$, t is a time or trend variable, $\alpha = [\alpha_y, \alpha_x]$ and β_i is a matrix of VAR parameters for lag i. According to Pesaran, *et al.* (2001), y_t must be I(1) variable, but the regressors, x_t can be either I(0) or I(1).

We can further develop a vector error correction model (VECM) as follows:

$$\Delta z_t = \mu + \alpha t + \lambda z_{t-1} + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{i=0}^{p-1} \gamma_i \Delta x_{t-i} + \varepsilon_t \qquad (3)$$

where $\Delta = 1 - L$. We now partition the long-run multiplier matrix, λ as:

$$\lambda = \begin{bmatrix} \lambda_{yy} & \lambda_{yx} \\ \lambda_{xy} & \lambda_{xx} \end{bmatrix}$$

The diagonal elements of the matrix are unrestricted, so the selected series can be either I(0) or I(1). If $\lambda_{yy} = 0$, then y is I(1). In contrast, if $\lambda_{yy} < 0$, then y is I(0).

The VECM procedures described above are important in testing of at most one cointegrating vector between dependent variable, y_t and a set of regressors, x_t. Moreover, in deriving our preferred model, we follow the assumptions made by Pesaran, *et al.* (2001) in Case III that is, unrestricted intercepts and no trends. After imposing the restrictions $\lambda_{xy} = 0$, $\mu \neq 0$ and $\alpha = 0$, the export-led growth hypothesis of Malaysia can be stated as the following unrestricted error correction model (UECM):

$$\Delta GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 EXP_{t-1} + \beta_3 IMP_{t-1} + \beta_4 GFCF_{t-1}$$

$$+ \beta_5 LAB_{t-1} + \beta_6 ER_{t-1} + \sum_{i=1}^{p} \beta_{7,i} \Delta GDP_{t-i} + \sum_{i=0}^{q} \beta_{8,i} \Delta EXP_{t-i}$$

$$+ \sum_{i=0}^{r} \beta_{9,i} \Delta IMP_{t-i} + \sum_{i=0}^{s} \beta_{10,i} \Delta GFCF_{t-i} + \sum_{i=0}^{v} \beta_{11,i} \Delta LAB_{t-i} \qquad (4)$$

$$+ \sum_{i=0}^{w} \beta_{12,i} \Delta ER_{t-i} + u_t$$

where Δ is the first difference operator, u_t is white noise disturbance term and all variables are expressed in logarithms. Equation (4) also can be viewed as autoregression distributed lag (ARDL) of order (p, q, r, s, v, w). The structure lag is determined by using Akaike's information criterion[5]. From the estimation of UECMs, the long-run elasticities are the coefficient of the one lagged explanatory variables (multiplied with a negative sign) divided by coefficient of the one lagged dependent variable (Bardsen, 1989). For example the UECM, (Equation (4), the long-run export elasticity and import elasticity are (β_2/β_1) and (β_3/β_1) respectively. The short-run effects are captured by the coefficients of the first-differenced variables in Equation (4).

In this study, bound test proposed by Pesaran, *et al*. (2001) will be applied to examine the short- and long-run relationship between economic growth and its determinants. The test involves three steps. First, we estimate the Equation (4) by using ordinary least square (OLS) technique. Second, we calculate Wald test (F-statistic) to discern the long-run relationship between the concerned variables. Wald test can be conducted by imposing restrictions on the estimated long-run coefficients of GDP, exports, imports, gross fixed capital formation, labour and exchange rate. That is, the null and alternative hypotheses are construct as follows:

$$H_0 : \beta_1 = 0 \ and \ \beta_2 = \beta_3 = ... = \beta_6 = 0 \text{ (No long-run levels relationship)}$$

$$H_A : \beta_1 \neq 0 \ and \ \beta_2 \neq \beta_3 \neq ... \neq \beta_6 \neq 0 \text{ (Exist long-run levels relationship)}$$

Third, we compare the computed F-statistic with the critical value tabulated in Table CI(iii), Pesaran, *et al*. (2001), pp. 300. According to Pesaran, *et al*., the lower bound critical values assume that the explanatory variables, x_t are integrated of order zero, or I(0), while the upper bound critical values assume that x_t are integrated of order one, or I(1). Therefore, if the computed F-statistic is smaller than the lower bound value, then we do not reject null hypothesis and we conclude that economic growth and its determinants do not appear any long-run relationship. Conversely, if the computed F-statistic is greater than the upper bound value, then we conclude that both economic growth and its determinants share a long-run level relationship. On the other hand, if the computed F-statistic falls between the lower and upper bound values, then the results are inconclusive.

Data Analysis

In this paper, the Malaysian real gross domestic product, real exports, real imports, gross fixed capital formation, labour force (proxied by population[6] data) and exchange rate series are under study. The data for the variables such as exports and imports were obtained from *Monthly Bulletin* of Bank Negara Malaysia (Malaysia's Central Bank). Besides, the annual data covers the period from 1959 to 2000 for GDP, labour force and exchange rate were collected from *International Financial Statistics*, published by International Monetary Fund (IMF). All of the dependent and explanatory variables, except labour are deflated by the consumer price index (CPI), whereby the year 1995 has been treated as a base year (1995 = 100). Furthermore, all of the series are transformed into log form.

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[5] In this study, we apply Akaike's information criteria (AIC) in selecting an appropriate lag-length. Overestimation of the lag-order seems preferable. This may suggest use of criteria such as Akaike's Information Criterion (AIC) or the FPE criterion, rather than the Schwarz's as the former move away from the lowest possible lag order at a slow rate as the sample size increases.

[6] In this study, population data rather than labour force data was used due to the unavailability of labour force data over a sufficiently long period of time.

RESULTS AND INTERPRETATIONS

The results of the DF test at level are reported in Table 1, by taking into consideration of trend variable and without trend variable in the regression. Based on Table 2, the t-statistics for all series, except labour (constant with trend) from ADF test are statistically insignificant to reject the null hypothesis of non-stationary at 0.05 marginal level. This indicates that these series are non-stationary at their level form. Therefore, these variables are containing a unit root process or they share a common stochastic movement.

Table 1: Results of the Unit Root Test

Variable	ADF Test	
	Level	First Difference
	Constant / No Trend	Constant / No Trend
Data Period (1959 - 2000)		
GDP	0.5516	-4.4412**
EXP	1.2911	-5.8399**
IMP	0.9533	-4.0589**
GFCF	-1.1192	-3.8995**
LAB	-2.6921	-4.4503**
ER	-1.0479	-4.3906**

Note: The null hypothesis is that the series is non-stationary, or contains a unit root. The rejection of null hypothesis for ADF test is based on the MacKinnon critical values. ** indicates the rejection of the null hypothesis of non-stationary at 5% significance level.

When the ADF test was conducted at first difference of each variable, the null hypothesis of non-stationary was easily rejected at 0.05 marginal level as shown in Table 1. It is not surprising because most of the macroeconomic variables are non-stationary at their level form that is, they are I(1) variables. Therefore, we concluded that the series are integrated of order one, and a higher order of differencing is not required to execute. The number of lag is set equal to one in order to avoid the problem of autocorrelation that is to ensure the error terms are uncorrelated and enhance the robustness of the results.

In order to examine both short-run and long-run relationships between GDP and its determinants, the bound test was applied. Autoregression distributed lag (ARDL) model was used to estimate the model, as indicated in Table 2. Using the Hendry's general to specific method, the goodness of fit of the specification (adjusted R-squared) and the standard error of regression remain superior (0.8998 and 0.0217, respectively).

Table 2: The Estimated ARDL (2,2,2,2,2,4) Model based on Equation (4)

Variable	Coefficient	t-Statistic	Probability
Intercept	-2.8482	-1.9266*	0.0700
GDP_{t-1}	-1.1279	-5.7011***	0.0000
$EXPORT_{t-1}$	0.6857	5.2213***	0.0001
IMP_{t-1}	-0.6831	-2.2891**	0.0344
$GFCF_{t-1}$	0.3534	3.3232***	0.0038
POP_{t-1}	0.8576	3.2258***	0.0047
ER_{t-1}	-0.3819	-2.8849***	0.0099
ΔGDP_{t-1}	0.1711	1.0811	0.2939
$\Delta EXPORT_{t}$	0.5550	9.3820***	0.0000
$\Delta EXPORT_{t-1}$	-0.1279	-1.5947	0.1282
ΔIMP_{t}	-0.3584	-1.8356*	0.0830
ΔIMP_{t-1}	0.0548	0.2841	0.7796
$\Delta GFCF_{t}$	0.1961	2.7841**	0.0122
$\Delta GFCF_{t-1}$	-0.0534	-0.6971	0.4946
ΔPOP_{t}	1.1348	3.3928***	0.0032
ΔPOP_{t-1}	0.2622	2.3445**	0.0307
ΔER_{t}	0.0673	0.9807	0.3397
ΔER_{t-1}	0.2880	2.4783**	0.0233
ΔER_{t-2}	0.3806	3.4839***	0.0026
ΔER_{t-3}	0.4135	3.7522***	0.0015
Adjusted R-squared	0.8998		
Standard Error of regression	0.0217		
F-statistic	18.5040***		
Probability (F-statistic)	0.0000		

Table 2: The Estimated ARDL (2,2,2,2,2,4) Model based on Equation (4) (continued)

II. Diagnostic Checking
i) Autocorrelation (Breusch-Godfrey Serial Correlation LM Test):
F(1) = 0.2940 [0.5946]   F(2) = 0.3657 [0.6993]
F(3) = 0.2393 [0.8675]   F(4) = 1.2500 [0.8235]
ii) ARCH Test:
F(1) = 1.6174 [0.2118]   F(2) = 1.3989 [0.2611]
F(3) = 0.9529 [0.4271]   F(4) = 0.6483 [0.6325]

iii) Jacque-Bera Normality Test: $\chi^2 (2) = 0.5949$ [0.7427]
iv) Ramsey RESET Specification Test: F-statistic = 2.8678 [0.1086]   Number of fitted terms = 1

Note: ***, ** and * denote significant at 1%, 5% and 10% significance levels.
Figures in square parentheses [] refer to marginal significance level.
For both Breusch-Godfrey LM test and ARCH test, we are testing for serial correlation and heteroscedasticity at
the significance level ranging from first to fourth order.

The robustness of the model has been confirmed by several diagnostic tests such as Breusch-Godfrey serial correlation LM test, ARCH test, Jacque-Bera normality test and Ramsey RESET specification test. All the tests revealed that the model has desired econometric properties, namely the residuals are serially uncorrelated and normally distributed, homoscedasticity and has a correct functional form. In addition to these diagnostic analyses, two tests were utilised to discern the stability of the parameters estimated. From Figure 1 to Figure 2, we found that all estimated parameters are stable over time, that is, both the Recursive Residual and Cusum Square test statistics are fall within the 5% critical line[7]. Therefore, the results reported are valid and reliable.

Figure 1: Recursive Residual Plot for the ARDL (2,2,2,2,2,4) Model based on Equation (4)
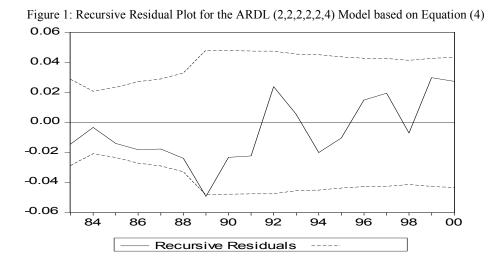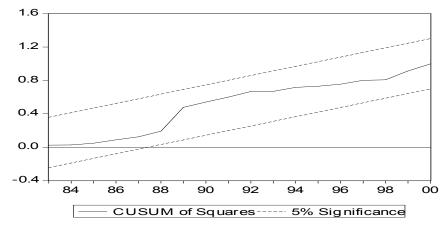
Figure 2: CUSUM of Squares Plot for the ARDL (2,2,2,2,2,4) Model based on Equation (4)

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[7] Nevertheless, it is well known that in the presence of lagged dependent variables the CUSUM of Squares test only provides a guide since the confidence lines are not correct. Given the large number of parameters being estimated in equation (5) and the small overall sample size, this test is likely to have low power.

In Table 3, the results of bound cointegration test obviously demonstrated that the null hypothesis of $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ against its alternative $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$ is easily rejected at 0.01 marginal level. The computed F-statistic (Wald test) is 6.4101 is greater than the upper critical bound value of 4.68. Therefore, based on the test results, we concluded that there exists a steady state long-run relationship among economic growth, exports, imports, gross fixed capital formation, labour and exchange rate. This means that these series cannot move "too far away" from each other and indirectly we can conclude that disequilibrium between export and economic growth is a short-run phenomenon.

Table 3: Bound Test based on Equation (4)

Computed F-statistic: 6.4101***		
Null Hypothesis: No Cointegration		
	Critical Value	
	Lower	Upper
1% significance level	3.41	4.68
5% significance level	2.62	3.79
10% significance level	2.26	3.35
Decision: Reject null hypothesis at 1% significance level		

Note: The critical values are taken from Pesaran *et al.* (2001), Table CI(iii) Case III: Unrestricted intercept and no trend. Page 300. ***, ** and * denote significant at 1%, 5% and 10% significance levels.

Table 4: Long-run and Short-run Elasticities based on Equation (4)

Variables	Short-run	Long-run
EXPORT	0.5550***	0.6079***
IMP	-0.3584*	-0.6057**
GFCF	0.1961**	0.3133***
LABOUR	1.3969***	0.7603***
ER	1.0819***	-0.3385***

Note: ***, ** and * denote significant at 1%, 5% and 10% significance levels, respectively.

Both the short- and long-run elasticities of economic performance with respect to exports, imports, gross fixed capital formation, labour and exchange rate were reported in Table 4. In the short-run, we found that there are four variables are positively correlated with economic growth, namely exports (0.5550), GFCF (0.1961), labour (1.3969) and exchange rate (1.0819), while imports are negatively correlated with growth (-0.3584). Among these positive variables, it seems that labour has greatest impact on growth, followed by exchange rate, exports and capital formation. Consistent with a priori, imports of foreign goods have a negative impact on economic growth. The result is expected because imported goods are unproductive in promoting the economic growth and do not contribute to the capital generation (especially consumption goods).

The results of long-run elasticities for both economic growth and its selected variables were shown in Table 4 (last column). We found that three variables (exports, gross fixed capital formation and labour) are significantly influence economic growth with the positive estimated elasticities of 0.6079, 0.3133 and 0.7603, respectively. The estimated coefficients imply that 1% increase in the exports, capital formation and labour will lead to a raise in the economic growth by 0.6079%, 0.3133% and 0.7603%. Other variables (imports and exchange rate) have an inverse relationship on economic growth with estimated parameters of –0.6057 and –0.3385, respectively. This means that an increase in the imports and devaluate the Malaysian currency (ringgit) by 1%, these effects will reduce the economic performance by 0.6057% and 0.3385%, respectively.

From these findings discussed above, how do we interpret the empirical results of relationship between exports and growth, especially impacts of exports on growth (measured by GDP)? We found empirical evidence to support the hypothesis of export-led growth in both short- and long-run. This indicates that the significant positive influence of exports on growth may depend on, along with others, country characteristics such as trade strategy, human capital development, technology level and macroeconomic policies. Export-promotion strategy has been recognized as a growth enhancing catalyst in both short- and long-term, however, this does not necessarily guarantee the strong positive relationship between exports and GDP. It is natural to believe that the success of utilising exports to promote economic performance by the Malaysian policy-makers may be related to her trade strategies (import-substitution and export-promotion policies from 1970s to early 1990s), human capital conditions, exchange rate regime and the effectiveness of macroeconomic policies. For example, the Malaysian government has been paying its attentions in stabilising both exports and imports. If we normalised both short-run and long-run elasticities of export variable in respect with import (Table 4), the calculated short-run elasticity is 1.5485 and the long-run elasticity is 1.0036. We found that there exists a positive one-to-one

relationship between export and import in the long run[8]. This means that short-run fluctuation between exports and imports are not sustainable in the long run and all Malaysia's macroeconomic policies being effective in bringing its exports and imports into a long-run equilibrium.

Besides, it is interesting to note that the positive elasticity of exchange rate on growth implies that the Malaysian government can promote high economic performance by devaluating its exchange rate. That is, devaluating exchange rate by 1% will lead to a rise in economic growth by 1.0819%. In the long run, however, the devaluation policy has a negative impact on economic growth that is, 1% increase in the exchange rate will incur a decrease in economic growth by 0.3385%. In fact, the Malaysian government has succeeded to devaluate its currency in order to improve the competitiveness of exported goods in the international markets and then stimulate the economic performance in early 1990s. However, the same policy may not work after the 1997 Asian financial crisis as most of the currencies in East Asian countries have already been depreciated at a large scale. In this critical period, the depreciation of one country in the region of East Asia may induce contagion effects to other countries, as they will also depreciate their currencies to improve the international competitiveness. Consequently, depreciation will make a country worse off[9]. This is why the Malaysian government has been implementing fixed exchange rate to avoid variability in the foreign exchange market, which may further jeopardise the domestic growth performance.

The negative relationship between economic growth and exchange rate in the long run also implies that the Malaysian government cannot heavily rely on the devaluation strategy in improving its competitiveness in the international markets. Conversely, the government should improve the competitiveness of domestic producers in terms of labour and capital productivity, as both variables are positive and significant to affect growth in both short run and long run.

To sum up, we conclude that the hypothesis of export-led growth is valid in the Malaysian economy in both short- and long-term with a positive effect. Nevertheless, its actual effect on domestic economic performance dependent on many factors such as trade policy, human capital development, exchange rate changes and macroeconomic policy.

CONCLUSION AND POLICY IMPLICATIONS

The aim of this paper is to comprehensively examine the relationship between exports and output growth in the Malaysian economy using longer time series data stemming from 1959 to 2000. The bound cointegration procedure introduced by Pesaran, *et al*. (2001) was applied to achieve the main objectives. Several conclusions could be drawn from the analysis. Firstly, there exists a stable long-run relationship among economic growth, exports, imports, gross fixed capital formation, labour and exchange rate (consistent with Doraisami, 1996 and Al-Yousif, 1999). Secondly, the unrestricted error correction model (UECM) indicates that exports, capital formation and labour have a positive impacts on economic growth in both short- and long-run, while imports has a negative relationship in both periods. Finally, we concluded that devaluation of exchange rate in the short run can be viewed as an effective policy in stimulating economic growth, but the strategy is not appropriate in the long run because it will slow down the economic growth.

As a small open economy, Malaysia heavily relies on foreign trade. This means that domestic economic performance is sensitive to the changes in the international markets. Therefore, the government should always implement effective macroeconomic policies in stabilising its trade balance and liberalising the country's trade and investment policies in improving the overall economic prosperity.

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[8] The one-to-one long-run relationship between export and import exists only when a country satisfies the intertemporal budget constraint (Husted, 1992 and Bahmani-Oskooee and Rhee, 1997). Husted has derived the theoretical relationship between exports and imports into a standard regression as follows:

$$X_t = a + b * MM_t + e_t$$

where X is exports, MM is imports and e_t is a white noise error term and stationary. It is expected that $b = 1$ when a country is satisfying the intertemporal budget constraint. Therefore, if the estimated coefficient of imports (MM) is equal to unity, then we say that a country has effective macroeconomic policies.

[9] This exchange rate policy objective may not be easy to attain. To do so it may be necessary, for instance, to examine the Marshall-Lerner condition is satisfied or not. That is, if the summation of the estimated coefficient of both exports and imports are above or below unity. If the summation of both estimated coefficients are below unity, then the devaluation strategy may even worse off the country's international trade condition. Besides, the success of the policy also depends on the domestic inflation level which may influence the behaviour of exchange rate. The policy-makers should ensure the high level of productivity and stable level of inflation in such a way that the later does not revert the expansionary effects of the former.

Based on the results in this paper, finally, we conclude that Verdoorn might have been right about the significance of exports for economic promotion. This export-growth link, however, is typically not the economic mechanism most closely associated with Verdoorn. Yet, an integral part of the Verdoorn's Law is that manufacturing growth drives growth of the gross domestic product, increased production rates in the manufacturing sector increase productivity in this sector, which in turn increases productivity in other sectors. Combining the export-growth hypothesis and Verdoorn's proposition, we are contributing an alternative version in testing the hypothesis of export-led growth.

ACKNOWLEDGEMENTS

REFERENCES

Al-Yousif, Y.K. (1999), On the Role of Exports in the Economic Growth of Malaysia: A Multivariate Analysis, *International Economic Journal*, 13, pp. 67 – 75.

Arnade, C. and Vasavada, U. (1995), Causality between Productivity and Exports in Agriculture: Evidence from Asia and Latin America, *Journal of Agricultural Economics,* 46, pp. 174-186.

Bahmani-Oskooee, M. and Rhee, H.J. (1997), Are Imports and Exports of Korea Cointegrated? *International Economic Journal*, 11, pp. 109-114.

Balassa, B. (1985), Exports, Policy Choices, and Economic Growth in Developing Countries after the 1973 Oil Shock, *Journal of Development Economics,* 18, pp. 23-35.

Bardsen, G. (1989), Estimation of Long-Run Coefficients in Error Correction Models, *Oxford Bulletin of Economics and Statistics*, 48, pp. 253–278.

Ben-David, D. and Loewy, M.B. (1998), Free-Trade, Growth, and Convergence. *Journal of Economic Growth*, 3, 143–70.

Dickey, D.A. and Fuller, D.A. (1979), Distributions of the Estimators for Autoregressive Time Series with a Unit Root, *Journal of American Statistical Association*, 74, pp. 427-431.

Dixon, R. and Thirlwall, A. P. (1975), A Model of Regional Growth Rate Differences on Kaldorian Lines, *Oxford Economic Papers*, 27, pp. 201–214.

Doraisami, A. (1996), Export Growth and Economic Growth: A Reexamination of Some Time Series Evidence of Malaysian Experience, *Journal of Developing Areas*, 30, pp. 233-230.

Dutt, S.D. and Ghosh, D. (1994), An Empirical Investigation of the Export Growth – Economic Growth Relationship, *Applied Economics Letters,* 1, pp. 44-48.

Feder, G. (1983), On Exports and Economic Growth. *Journal of Development Economics*, 12, 59–73.

Findlay, C. and Watson, A. (1996), Economic Growth and Trade Dependency in China. DP no.96/5, Chinese Economies Research Centre, University of Adelaide.

Fosu, A. K. (1990), Exports and Economics Growth: The African Case, *World Development*, 18, pp. 831 – 835.

Fosu, A. K. (1996), Primary Exports and Economic Growth in Developing Countries, *World Economy*, 19, pp. 465 – 475.

Gujarati, D. N. (1995), *Basic Econometrics,* 3rd ed., McGraw-Hill, US.

Hart, O. (1983), The Market Mechanism as an Incentive Scheme. *Bell Journal of Economics,* 14, 366–82.

Henriques, I. and Sadorsky, P. (1996), Export-led Growth or Growth-Driven Export? *Canadian Journal of Economics,* 3, pp. 440-555.

Husted, S. (1992), The Emerging U.S. Current Account Deficit in the 1980s: A Cointegration Analysis, *The Review of Economics and Statistics*, 74, pp. 159-166.

International Monetary Fund, *International Financial Statistics*, various issues, Washington D.C.: IMF.

Kaldor, N. (1966), *Causes of the Slow Rate of Growth of the United Kingdom: An Inaugural Lecture*, Cambridge University Press.

Kavoussi, R.M. (1984), Export Expansion and Economic Growth: Further Empirical Evidence, *Journal of Development Economics*, 14, pp. 241-250.

Krugman, P.R. (1984), Import Protection as Export Promotion. In H. Kierzkowski (ed.) *Monopolistic Competition in International Trade,* Oxford University Press, Oxford.

Lancaster, K. (1980), Intra-industry Trade under Perfect Monopolistic Competition, *Journal of International Economics,* 10, pp. 151–175.

Leon-Ledesma, M.A. (2000), Economic Growth and Verdoorn's Law in the Spanish Regions, 1962-91. *International Review of Applied E Economics*, 14, 55-69.

Malaysia, Bank Negara, *Monthly Statistical Bulletin*, various issues.

Malaysia, Ministry of Finance, *Economic Report, 1999/2000*, various issues.

Mamgain, V. (1999). Are the Kaldor–Verdoorn Laws Applicable in the Newly Industrializing Countries? *Review of Development Economics*, 3, pp. 295–309.

Pesaran, M.H., Shin, Y. and Smith, R. (2001), Bound Testing Approaches to the Analysis of Level Relationships, *Journal of Applied Econometrics*, 16, pp. 289-326.

Reinhardt, N. (2000), Back to Basics in Malaysia and Thailand: The Role of Resource-based Exports in their Export-led Growth, *World Development*, 28, pp. 55-77.

Riezman, R.G., Summers, P.M. and Whiteman, C.H. (1996), The Engine of Growth or its Handmaiden? A Time Series Assessment of Export-led Growth, *Empirical Economics*, 21, pp. 77-113.

Serletis, A. (1992), Export Growth and Canadian Economic Development, *Journal of Development Economics*, 38, pp. 133-145.

Shan, J. and Sun, F. (1998), Export-led Growth Hypothesis for Australia: An Empirical Re-investigation, *Applied Economics Letters*, 5, pp. 423-428.

Thornton, J. (1996), Cointegration, Causality and Export-led Growth in Mexico, 1895-1992, *Economics Letters,* 50, pp. 413-416.

Thornton, J. (1997), Export and Economic Growth: Evidence from 19th Century Europe, *Economics Letters*, 55, pp. 235-240.

Verdoorn, P.J. (1941), Fattori che Regoleno lo Svilupo della Produttivita del Lavaro, *L'Industria*, 1, pp.3–10.

World Bank (1993), *The East Asian Miracle: Public Policy and Economic Growth.* New York: Oxford University Press.

An Analysis of the Labour Supply in Sarawak

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ABSTRACT

This research attempts to identify the main factors that affect the labour supply in Sarawak. Labour is an important factor in the production process and sufficient attention should be given to it so as to increase the production of goods and services. This in turn will contribute to higher Gross Domestic Product and boost the economy of Sarawak. This study is based on a comprehensive econometric model for the supply of labour. The linear regression analysis is used to determine the validity of each factor identified. They include real wage, investments, inflation and taxes. This study covers a time period of 23 years from 1980 to 2002.

INTRODUCTION

In the 1980s, the Gross Domestic Product of Sarawak was growing at a rate of 6.7% annually. However, in the 1990s, this growth rate decreased to only 5.5% per annum. This was due to the financial crisis, which affected many countries in South East Asia in 1997 and continued to 1998. In 1998, the economic growth of Sarawak recorded a negative value of 7.3% as compared to negative 6.7% for Malaysia. In this study, the average growth rate of the economy of Sarawak is considered to be satisfactory.

There is an important question to be answered. Is the mobility of the labour supply among sectors in Sarawak ready to face the challenges of world globalization? This study aims to study the factors that affect the labour market in Sarawak. It also aims to gain the attention of those who are involved in developing the human resources so as to improve and train the personnel required for the various sectors of the economy. Policy makers should also be made aware of the needs of the country and implement only policies that enhance the development of the country.

The general objective of this research is to identify the factors that affect the labour supply in Malaysia specifically for Sarawak. The specific objectives are firstly to identify the independent variables that affect labour supply in Sarawak. Secondly, to estimate the independent variables' parameters using linear regression methods. Finally, the specific objective is to study the implications of the labour market and provide suggestions for formulating effective future labour policies.

This research paper is divided into five sections. The first part deals with the historical development of the labour supply in Sarawak. The second section is the literature review of previous studies. The third chapter involves the research methodology used. In the fourth section, there is the discussion of the analysis results.

The final section will provide suggestions on how to improve the labour supply in the labour market as well as the implications of the present labour market scenario to policy makers.

THE LABOUR SUPPLY MARKET IN SARAWAK

The workforce in Sarawak depends greatly on the size of the population, particularly on those who are eligible to join the labour force. According to Table 1, the total work force in Sarawak has increased from 678,338 persons in 1980 to 1.3 million in the year 2000. The annual growth rate has decreased from 4% in the period 1981-1990 to only 2.6% in the period from 1991-2000.

Table 1: The Working Age Groups and the Labour Force Growth Rate in Sarawak (1980-2002)

| | 1980 | 1985 | 1990 | 1995 | 2000 | 2001 | 2002 | Annual Growth Rate (%) | |
								1981-1990	1991-2000
Population (15-64) ('000)	678.3	851.7	1,003	1,153	1,299	2,119.0	2,214.4	4.0	2.6
Workforce ('000)	477.2	636.2	776.3	835.9	935.2	943.4	909.1	5.0	1.9
Employed ('000)	457.2	587.5	698.9	789.2	893.3	903.4	917.7	4.3	2.5
Rate of Participation (%)									
Total	70.4	74.7	77.4	72.5	71.9	70.3	68.3	-	-
Male	89.7	90.4	90.6	89.4	87.9	64.2	61.2	-	-
Female	49.5	59.2	64.1	54.7	55.3	35.8	38.8	-	-
Unemployment Rate (%)	4.2	7.6	10.0	5.6	4.5	4.2	-1.0	-	-

Source: Sarawak Annual Statistics Bulletin, 2003
Note: na - not available

The labour force has recorded an increase since the 1980s. Today, 70% of those eligible to work have joined the labour force. In 1990, the rate of the labour force participation increased to 77.4%. This was due to greater participation from the female members of the population. The greater female participation was a result of higher education achieved by the fairer sex as well as more jobs created which were suitable for the females.

However, by the 1990s, the participation of both male and female in the workforce decreased. The fall in the workforce participation and the slower growth of the population contributed to the lower growth of the labour force recording 5% in the 1980s and decreasing to 1.9% in the 1990s. The population's growth rate during the period of 1991 to 2000 was 2.5% while the growth rate for the labour force was only 1.9% as seen in Table 1.

RELATED REVIEW

Hall et.al (1989), in his paper entitled "The UK Labour market: Expectations and Disequilibrium" found that there are a few empirical elements which can bring about inequilibrium in the labour market. In this study, the labour supply is taken to depend on variables such as real consumption wage, real value of unemployment benefits, the working population, union power and real interest rate. The results of this survey indicated that an increase in real interest rate decreases the labour supply. In addition, it was also proven that real consumption wage and the working population has positive effects on labour supply while the real value of unemployment benefits and union power has negative effects.

Rochjadi, Achmad, Leuthold and Jane (1993) in their study entitled "The Effect of Taxation on Labour Supply in a Developing Country" applied modern econometric techniques to cross-sectional data to estimate the labour supply function for workers in a cross-section sample of Indonesian households. Based on the estimated data, labour supply elasticities are calculated. This study also shows that Indonesian labour supply tend to decrease if there is an increase in taxes.

Snow and Warren (1990) also did a research on the theory of human capital investment under uncertainty by incorporating post-investment labour supply as a choice variable. The results show that human capital investments decrease in response to an increase in its risk return if such investment is an inferior activity and the preferences show decreasing risk aversion. However, if the investment is normal, then the effect of an increase in risks is indeterminate. These results are based on the assumption that the level of human capital investment affects risks on future wage rate.

Both foreign and domestic investments affect the labour supply in Malaysia. Malaysia has abundant labour with high learning capacity and the labour is cheaper compared to developed countries' wages. Thus, in accordance with Lewis Two-Sector Model, it is argued that the surplus labour supply in the agriculture sector will move to the urban areas for jobs where the wage rate will be higher. It will therefore change a developing nation to a newly industrialized nation. This is the achievement Malaysia aim for by the year 2020.

Winkler (1991) in her paper The Incentive Effects on Women's Labour Supply" studied the effects of Medicaid" on women's labour supply. Medicaid is a government-provided health insurance scheme with links

to AFDC. It is an aid to help families with dependent child. It was found that cash benefits provided by the programme AFDC alter the supply of labour whose heads of households are females.

MODEL AND DISCUSSIONS

The sample for this research is taken from data taken from a time period of 23 years from 1980 to 2002. The dependent variable is labour supply. The independent variables are Gross Domestic Product, real wage, inflation, investment, taxes and employees.

The various data for this analysis are taken from Bank Negara's Monthly Report, Malaysian Economic Report (1980-2002), Bank Negara's Annual Report, World Bank Collection, The 7th and 8th Malaysian Plans, Employment Investigation Report, Sarawak Annual Statistics Reports and OPP2 (1991-2000).

In this research, the linear regression model is used to study the relationship between the dependent and the independent variables. The linear regression model is unique in that the endogenous variable in one equation may be an explanatory variable in another equation.

Model 1:

$$S_t = \beta_1 + \beta_2 W_t + \beta_3 I_t + \beta_4 INF_t + \beta_5 T_t + \beta_6 POP_t + U_t \dots (1)$$

where

S_t	=	labour supply
W_t	=	real wage rate
I_t	=	investments
INF_t	=	inflation
T_t	=	taxes
POP_t	=	number of employees
U_t	=	error

It is found that real wage (W), investment (I), Inflation (INF), tax (T) and labour supply (POP) are the variables that can affect the supply of labour in a developing country such as Malaysia in general and Sarawak in particular.

In this study, income per capita is taken as a proxy to real wage as the data for real wage is not available. Gross capital investment is taken to represent investment as it is an impetus to the economic growth of Sarawak and therefore contributes to the labour supply in Sarawak.

Consumer Price Index is indicative of the inflation rate while tax is represented by direct taxes collected by the government. The labour supply takes into account all those whose ages range from 15 to 64 be they employed or otherwise.

Model A:

$In\, S_t\ = 10.737 + 0.167 In W + 0.013 In I + 1.143 In INF - 0.154 In T - 0.069 In POP$

$\quad$ t $\quad = \ $ (14.496) (1.780) $\quad$ (2.446) $\quad$ (5.188) $\quad$ (-2.916) $\quad$ (-1.020)

R^2 = 0.985 $\qquad\qquad$ Adjusted R^2 $\qquad$ = 0.981
F = 229.070 $\qquad\qquad$ Durbin-Watson $\qquad$ = 1.116

In this model, the results show that 98% of the labour supply is explained by the variables listed. This proves that the variables listed are suitable for the analysis carried out. The F-Test is 229.070. The T-Test shows that all the variables are valid. The Durbin-Watson Test is 1.106 and is in the non-conclusive zone. The results for Model A show that all the variables have correct algebraic signs except for labour supply that has a negative sign. Thus, we reject Model A.

Model B:

$In\ S_t = \beta_1 + \beta_2\ In\ \beta_3\ InI + \beta_4\ InINF + \beta_5\ InT$

$In\ S_t = 10.072 + 0.208InW + 0.011InI + 1.051InINF - 0.162InT$

$\quad t = (28.575)\ (2.442) \qquad (2.238) \qquad (5.223) \qquad (-3.119)$

$\qquad R^2 = 0.984 \qquad\qquad\qquad \text{Adjusted } R^2 \qquad\qquad = 0.981$

$\quad F = 285.449 \qquad\qquad\qquad \text{Durbin-Watson} = 0.985$

The R2 and Adjusted R2 in Model B proves that about 98% of the labour supply is explained by the variables listed in this model. The F value is 285.449 shows that it is significant and all the values from the T-test are reliable. The Durbin-Watson value is 0.985. This value lies in the non-conclusive zone and shows that there is no first-degree correlation. In Model B, all the variables have correct algebraic signs and affect the labour supply of Sarawak.

It was found that Model B is the better regression model to depict the labour supply scenario in Sarawak. All the variables in this model have correct relationships with each other. The coefficients have high values except for investment and tax, which have lower values. There are few empirical analysis studies done on the labour supply in Malaysia. However, studies that are quite similar to this study are carried out only by researchers in developed countries. In addition, the foreign studies are quite different as their emphasis is more on the effects of taxes to the supply of labour.

In his study, Wildie (1998) used the time series method to test his econometric model. His results indicate that the value of R2 and adjusted R2 is 0.7446 and 0.7233 respectively. These values are lower than the values proven in this study in which the value for R2 is 0.984 and 0.981 respectively. The auto-correlation value for this study is 1.5612 as compared to 0.985 in Wildie's study.

The problem may be due to the different statistical methods used, which is the Johansen Long Term Relationship Method. Besides, the use of time series can also affect the results of the analysis especially the time period taken for the study be it on an annual or monthly basis. However, the coefficient in this study is suitable for our country.

The research carried out by Blomquist and Hansson-Brusewits (1990) showed that high taxes would give a wider estimate to the supply of labour. In earlier studies done by Bingley and Walker (1997), Blundell, Duncan and Meghir (1992), Duncan and Giles (1996), Ermisch and Wright (1999), it was found that the wage rate and the level of income have significant effects on the male workers as compared to the female workers.

Thus, it is noted that wage rate is a significant factor that affect the supply of labour in Sarawak. This is because wage rate affects the level of income of the workers directly. The higher the wage rate, the higher will be the income of workers. In conclusion, it is proven that the model used in this research is the best for analyzing the supply of labour in Sarawak.

SUMMARY AND IMPLICATIONS

In this study, the measurement of labour supply in Sarawak is based on the macro economy of the state. In general, this researcher has successfully formulated a model to measure the labour supply in Sarawak based on the results of previous studies.

The results of this research showed that the variable, real wage has a significant effect on the supply of labour in the labour market. The higher the real wage level, the greater will be the labour supply in the market.

Besides, investment as a variable plays a significant role in influencing the local labour market. This is because investment is a resource for the development of the economy and directly affects the usage of labour. The higher the investment level, the more will be the demand for labour. Conversely, if the level of investment is decreased, then the demand for labour will fall.

It is also found that inflation as a variable significantly influences labour supply. This is because inflation is usually linked to the level of unemployment. When there is a high rate of inflation, the level of unemployment will increase. On the other hand, if the unemployment rate is low, real wage will increase at a faster rate and there will be an increase in the supply of labour in the market.

The labour supply market in Sarawak also indicates that the amount of tax to be paid is a significant factor that affects labour supply. Direct tax directly affects labour supply. The higher the tax rate ascertained by the government, the lower would be the supply of labour. However, it may increase the supply of illegal labour.

The total work force as a variable is not a good factor for measuring the labour supply in Sarawak. This is because the results show that labour force has a negative relationship with labour suply.

Sarawak is presently making serious efforts to develop its economy in the wake of the economic globalization. It is also the human resource policy under the Eight Malaysian Plan to increase the supply of highly skilled and knowledgeable workers for the development of a knowledge-based economy. Thus, it is important that the Sarawak government take steps to produce a quality labour force in the local labour supply market.

In this study, it is found that the State government should be more sensitive towards stabilizing the development of the economy as well as the implementation of development projects.

In connection with wages policy, there is no evidence to indicate that there is a relationship between real wage rate and the labour supply in Sarawak. Therefore, it can be concluded that real wage rate is not a significant factor that affects the development of the work force.

In the discussion above, investment is considered an important factor that affects the supply of labour. A decrease in the level of investment in Sarawak, be it local investments or foreign investments will bring about direct effects on the demand for labour in the labour market. Therefore, investment policies must be carefully analyzed so as to bring about positive effects in the labour market.

Inflation is also another very important aspect and must be studied carefully. Inflation also has direct effects on the level of unemployment. Changes in the level of inflation or the rate of unemployment may have adverse effects on the level of production in the country. The implementation of good policies will help to overcome the high rate of inflation or the high rate of unemployment.

This study has also proven that tax, as a variable, has significant bearing on the supply of labour in Sarawak. Thus, any changes in tax policy may bring about different effects such as the supply of underground labour, savings or capital investments in human resource. The government needs therefore to implement tax policies carefully so that there will be no adverse effects.

During the financial crisis of 1997, a lot of unskilled labour was laid off, especially in the industrial sector. To ensure that this scenario does not recur in the future, it is hoped that the government train the workers so that they become skilled and multi-skilled workers. This is to increase the overall productivity of all workers in the State.

The participation by women in the work force has increased the labour force significantly particularly for workers coming from the 20 years old to 29 years old age group. However, it is found that young people who are in the work force are neither skilled nor productive because they do not have sufficient education or work experience. Thus, the quality of the work force is low.

In this connection, the Ministry of Human Resource through its Workers' Retraining Scheme (SLPD II) and Graduates Training Scheme (SLG) hope to produce highly skilled workers who are able to compete to enter the labour market. Besides, increasing the quality of education and the quality of industrial training will ensure that the supply of human resource is in tandem with the level of technological changes and demands of the market.

After Sarawak entered the 1990s, it was faced with limited labour supply. Therefore, employers were forced to increase its wage rate in order to attract more workers to enter the labour market. However, a consistent increase in wage rate will raise the cost per unit. This will mean that the goods produced will cost more and are less competitive in the international market.

REFERENCES

Anne E. Winklers (1990), The Incentive Effects of Medicaid on Women's Labor Supply, Journal of Human Resources, Vol16.2: p. 309-335.

Arthur Snow and Ronald S. Wassen (1990), Human Capital Investment and Labor Supply Under Uncertainty, International Economic Review, Vol 31.1, pg 195-205.

Bank Negara Malaysia , http://www.bnm.gov.my

Belton M. Fleisher and Thomas J. Kniesner (1980), Labour Economics: Theory, Evidence and Policy, Prentice-Hall.

Bingley, P., and I. Walker (1997): "Labour Supply, Unemployment and Participation in in-work Transfer Programmes," Economic Journal, 107, 1375–1390.

Blomquist, N. (1983), The effect of income taxation on the labour supply of married men in Sweden, *Journal of Public Economics*, 22, 169-197.

Blomquist, S., and U. Hansson-Bruseuitz (1990) 'The effects of taxes on male and female labor supply in Sweden.' *Journal of Human Resources* 25(3), 317–357

Blundell, R., A. Duncan and C. Meghir (1998) *Estimating Labour Supply Responses Using Tax Reforms*, Econometrica, 66:4, 827-861.

Blundell, R., A. Duncan, and C. Meghir (1992) 'Taxation in empirical labour supply models : Lone mothers in the uk.' *Economic Journal* 102, 265–278

Damodar N. Gujarati (1995), *Basid Econometrics*, Third Edition, McGraw-Hill Interbational Editions, Singapore.

Duncan, A., and C. Giles (1996): "Labour Supply Incentives and Recent Family Credit Reforms," Economic Journal, 106, 142–155.

Eissa, N. and J. Liebman (1996) *Labor Supply Response to the Earned Income Tax Credit*, Quarterly Journal of Economics, 111:2, 605-637.

Ermisch, J. and R. Wright, (1992), 'Differential Turns to Human Capital in Full-Time and Part-Time Employment', in *Women's Work in the World Economy*, ed. by Nancy Folbre. MacMillan, London.

Hansen, C., L. Pedersen and T. Sløk (1995) *Progressive Taxation, Wages and Activity in a Small Open Economy*, Copenhagen Business School EPRU Working Paper 95:21.

Hausman, J. A., and P. A. Ruud (1984): "Family Labor Supply with Taxes," American Economic Review, 74, 242–248.

Layard, R., Nickell, S. and Jackman, R. (1994*) The Unemployment Crisis*. Oxford University Press.

Malaysia (2000), *Report of Labor Force Survey*, Department of Statistics, Kuala Lumpur.

Malaysia (2002), *Buku Tahunan Perangkaan Malaysia 2002*, Jabatan Perangkaan Malaysia, Putrajaya.

Malaysia Economic Planning Unit, http://www.epu.jpm.my

Meyer, B. D., and D. T. Rosenbaum (2002) 'Welfare, the earned income tax credit, and the labor supply of single mothers.' NBER WP #7363

Patrick Wildie (1998), The Queensland Labour Market: An Empirical Analisis of Labour Supply dan Demand, Paper presented at the 27th Annual Conference of Economists, Universiti of Sydney, Sydney.

Rochjadi, Achmad: Leuthold, Jane H. (1994), The Effect of Taxation on Labor Supply in a Developing Country: Evidence from Cross-Sectional Data, Econimic Development and Cultural Change(EDC), Vol 42.2, pg 333-350.

S.G. Hall, S.G.B. Hendry et.al. (1989), The United Kingdom Labour Market: Expectations and Disequilibrium, Applied Economics, Vol 21, pg 1509-1523.

Sarawak State Planning Unit. http://www.spu.sarawak.gov.my

Liquidity Effects of Money Shock on Short Term Interest Rates

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ABSTRACT

The main purpose of this study is to empirically investigate the liquidity effects of money shocks on short-term interest rates. The research was done for selected five ASEAN countries, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. Monthly data was used in the analysis covering the period of 1983:01 to 2000:12. Liquidity effects do exists in Asean countries but were of different patterns and for different duration. A negative effect of domestic short-term interest rate immediately occurred after the money shocks for all countries accept Indonesia. The longest effect was found for Malaysia while the shortest was on the Philippines, which was only for five months. For Thailand initially negative for a brief period, turning positive, and ultimately negative. Finally, Indonesia showed the existence of liquidity effect only after twenty months subsequent to the money shock. The liquidity effects exist for a long duration. Empirical evidences and findings from this study conclusive found that liquidity effects do exists in the ASEAN countries which each country registering its own pattern and length. This is acceptable considering the large variations in the economy and the financial institutional foundation between the five countries studied.

INTRODUCTION

Today, societies often-used credit money, which is derives its value not by the substance from which it is made, but by government decree. A fiat monetary system allows the money supply to be the product of human decision rather than the bounty of nature. Changes in quantity of money have important implications for key economic variables such as output, employment and the price level. Too rapid an expansion of the money supply leads to inflation while too slow an increase typically results in recession.

The short run negative response of interest rates to shocks in the money supply has been an integral part of traditional monetary policy analysis. This "liquidity effect" of an expansionary monetary policy is intuitively appealing and many explanations have been suggested. The effect of an increase in the money supply on the level of interest rates may be divided into three channels: a *liquidity effect, an income effect and an inflation expectation effect.* Initially, an increase in the money supply increases liquidity in the economy triggering a decline in interest rate leading to higher liquidity. Lee Ohanian and Alan Stockman (1995), defines the liquidity effect as the 'purported statistical relation between expansion of bank reserves or a monetary aggregate and short run reductions in short term interest rates'. Their analysis shows that in a general equilibrium environment, exogenous changes in money can, in principal, affect real output, prices or the interest rate. If money is neutral and prices adjust instantaneously, monetary policy changes the prices level, but not output or the real interest rate. If a price does not adjust instantaneously, a liquidity effect occurs, the real interest rate declines in response to a monetary expansion. The failure of the price level to adjust immediately to its new long run equilibrium however also produces expectations of inflation. From the Fisher relation (referred to Fisher Hypothesis), the nominal interest rate may either rise or fall, depending on the relative size of the liquidity and price expectation effects. If the liquidity effect is dominant, both

the nominal and real price expectations will be affected and nominal and real rates will fall. However, if the price expectation effects are dominant, the nominal interest rates will rise.

Ohanian and Stockman's also define a liquidity effect to be the systemic change in an interest rate as the result of a monetary expansion and subsequently distinguished between real and nominal liquidity effects. Hoover(1995) however said that it would be better to reserve the term liquidity effect only to those changes in the real rate of interest induced directly by monetary expansion. The only interesting liquidity effects are real because, without a change in the real rate of interest, there can be no accompanying effect on any other variables that interest us: GNP, investment; consumption and employment.

The effect on interest rates of a change in monetary policy has long been an important topic in monetary economics and there is now a large body of literature that has studied the existence and magnitude of such effects. Such effects can be represented in money demand and supply relationship models as belows:

$$m_t^d = \alpha_1 + \alpha_2 r_t + \varepsilon_t^d \tag{1.1}$$
$$m_t^s = \beta_1 + \beta_2 r_t + \varepsilon_t^s \tag{1.2}$$
$$\therefore m_t^d = m_t^s$$

where d indicates demand, s supply, m_t is the log of nominal money, r_t is the nominal interest rate, while ε_t^d and ε_t^s are mutually correlated demand and supply shocks. r_t responds to shifts in money supply engineered by varying β_1 and the relation $dr_t / d\beta_1 = (\alpha_2 - \beta_2)^{-1}$ means that the interest rate decreases when money supply increases, provided $\alpha_2 < 0$ and $\beta_2 \leq -\alpha_2$. This negative reaction of the interest rate to a rise in money supply is termed the liquidity effect. When there is a random variable attached to money supply, a change in β_1 can be thought of as a movement in the expected value of $\beta_1 + \varepsilon_t^s$, and the money supply shock might simply be re-labeled $\varepsilon_t^{s'}$, with the conceptual experiment performed by changing the expected value of $\varepsilon_t^{s'}$ from $\beta1$ to a new value. Mathematically, there is no difference between the responses to a change in $\varepsilon_t^{s'}$, so we concentrate only on describing the effects of a change in ε_t^s. This orientation showed that the liquidity effect focused upon the simulated response of interest rates to a money supply shock, setting all other shocks to zero

Most economists believe that liquidity effects appear in the data for the U.S economy, though the size of the effects (if it even exists) is a subject to a controversy, largely due to the "identifications problems" in statistical modeling. The theoretical explanation for nominal or real liquidity effects also remains controversial. While many economists interpret liquidity effects as results of sluggish nominal price adjustments, others interpret them as reflecting costs of complete and continuous participation in markets that allow monetary changes to cause redistributions or to channel spending into certain areas (such as increased spending by firms on factors of production).

Others suggest that liquidity effects reflect part of the economy's coordination on a particular equilibrium when multiple solutions are possible. Other alternative explanations may appear in future research. Goodfriend (1995) has recently suggested a model in which imperfectly competitive firms face kinked demand curves and price sluggishness emerges endogenously, creating real effects of monetary policy in which liquidity effects play a role.

Another issue to addressed is how shocks to monetary policy are measured. Christiano and Eichenbaum (1992a) presented two measures of money shocks: one is unanticipated growth of some monetary aggregates, such as M1 and non-borrowed reserves, and the other is innovations to the short-term interest rate, such as the federal fund rate, as suggested by McCallum (1983) and Sims (1992).

The traditional explanation of the liquidity effect is based on the demand for money analysis. As Friedman (1969) shows, the analysis is dependent upon the assumption that the money supply is exogenous. If it is not exogenous, it is possible that money supply and money demand may be influenced by a set of common factors. In this case, it will be difficult to distinguish whether the short run negative relationship between the money supply and interest rates is due to other (a third factor) negative relationship between interest rates and money demand or due to third factors that influenced both money demand and money supply, or some combination of the two.

Pagan and Robertson (1992) argued that early failure to detect a liquidity effect has been replaced by a conclusion that there is generally a liquidity effect when inferences are based on system method. Early studies by Cagan and Gandolfi (1969) and Gibson (1970a) found that interest rates fall as the growth rate of the money supply increases. This same methodology was employed in later studies such as Melvin (1983) and Reichenstein (1987), but the

liquidity effect vanishes in the 1970's as the expected inflation effect dominates the liquidity effect. However in a recent study, using a similar approach, Tarhan (1995) found the significant evidences of a liquidity effect.

From a previous study, a few problems occurred while analyzing the data to capture and isolate the liquidity effect and inflation expectation effect. For example, Benjamin, J.C Kim and Noor Ghazali (1998) who studies the liquidity effect on the G-7 countries, found a consistent negative relationship between money shocks and interest rates. They used single-equation distributed-lag model to capture the existence of the liquidity effect. The impulse function (IRFs) test was used to estimate the effect of money supply shocks on interest rate for each of the six countries and the result showed strong evidences of the existence of liquidity effects. These research focus on the vector error correction model to determine the existence of long-run relationship between the selected financial variables and also to identify the endogeneity of dependent or independent variable in a short-run relationship. The IRFs was employed to VECM to estimate the effect of money supply shocks on interest rate for each of the five ASEAN countries namely as Indonesia, Malaysia, the Philippines, Singapore and Thailand. As the liquidity in the ASEAN economies increases interest rates tends to also increase and causing the inflation. This can over-shadowed the liquidity effect. The inflation expectation effect may show up more strongly in long-term interest rates rather than short-term rates.

METHODOLOGY

This analysis are used the time series data, and all the variables used are required to be stationary. First, to check the stationarity of the variables, we implement the unit root test. The unit root problem, which indicates the nonstationarity of the variable, involved two tests, namely the Augmented Dicky-Fuller (ADF) test. These common tests usually are carried out to avoid 'spurious regression'.

Second, we identified the stability of the variables in the long-run by using the Johansen-Juselius maximum likelihood procedure. This application can determine the number of cointegrating vectors that contain information about the existence of long run equilibrium relationship between the variables. The Granger causality test was then applied to identify the presence or absence of causality between the variables in the short run relationship. Finally, we implement the impulse response functions to investigate the dynamic effect of the short-term interest rates and world interest rates by the innovations of money supply. Cholesky decomposition was used to impose restrictions on the contemporaneous matrix.

Model Specification and Estimating Procedures

Early empirical studies of the liquidity effect used single distributed lag model by regressing short-term interest rate changes on changes on money growth rates assuming that there is no contemporaneous influence from other variables. This analysis will include a world interest rate to capture the influence of foreign variables on the domestic interest rate.   This is because of the rationale that capital flows moving into and out of a country in an attempt to take an advantage of interest rate differentials, are the mechanism through which any foreign variable affects the domestic interest rate.

The equation is as follows:

$$\Delta IR_t = \alpha + \beta(L)\Delta M3_t + \gamma(L)R^*_t + \varepsilon_t \qquad (3.18)$$

where, IR is the domestic interest rate, M3 is the money supply and R* is the world interest rate, ε is the disturbance term of zero mean, L is the lag operator ($L^j x_t = x_{t-j}$) and Δ is the first difference operator.

From the statistical model developed by Johansen (1988,1991), we can test the co integration in a vector autoregressive (VAR) framework, by using the methods that can be used to characterize and estimate the time profile of the effect of the shocks on one or more co integrating relations. The most obvious method that can be apply is the impulse response approach, originally due to Sims (1980), to estimate the time profile of the effect of money shocks on the short term interest rates on the co integrating relations. This approach has been recently considered by Lutkepohl and Reimers (1992) and Mellanser *et al*. (1992), but it gave them major criticism that the estimated impulse response functions are not unique and depend on the way the in the underlying VAR model are orthogonolized. The results also can be influenced by the order of the entry of the variables or equations in the VAR model, which itself is a further reflection of the non-uniqueness problem.

Lee and Pesaran (1993) find an alternative approach to estimate the time profile of the effect of the system-wide shock on the co integrating relations. They actually measured the impact of the system wide-shock on the co integrating relations by their 'persistence profiles' defined as the scaled difference between the conditional variances of the n - step and the (n-1)-step-a-head forecasts, and viewed as a function of n, the forecast horizon. This measure captures the essential difference that exists between co-integrated and non-co integrated relations, and provides unique time profiles and do not require the prior orthogonalization of the effects of the shocks to the co integrating relations. If the relations between I(1) variables that are not co integrated, the effects of the shocks remain forever, while in the case of co integrated variables, the impact of shocks will be transitory and eventually disappear as the economy returns to its steady trend or its long run equilibrium. The existing tests of co integration focused on the limiting value of the persistence profile and only test whether this measure tends to zero as the horizon of the profile, n tends to infinity.

In estimating the persistence profiles, Johansen (1988,1991) Maximum Likelihood (ML) method are used based on the full dynamic specification of the Gaussian vector error correction (VEC) model. The result does not showed the unique set of co integrating relations when the number of such relations is larger than unity.

The general error correction model (VECM);

$$\Delta y_t = a_{0y} + a_{1y}t - \Pi_y z_{t-1} + \sum_{i=1}^{p-1} \Gamma_{iy} \Delta z_{t-i} + \psi_y w_t + u_{ty} \tag{3.19}$$

where,

$$z_t = \begin{pmatrix} y_t \\ x_t \end{pmatrix}$$

- y_t is an $m_y \times 1$ vector of jointly determined I(1) variables
- x_t is an $m_x \times 1$ vector of I(1) exogenous variables
- w_t is a q x 1 vector of I(0) exogenous variables
- Intercepts and deterministic linear trends

The implicit VAR model for the I(1) exogenous variables, x_t is given by

$$\Delta x_t = a_{0x} + \sum_{i=1}^{p-1} \Gamma_{ix} \Delta x_{t-i} + \psi_x w_t + v_t \tag{3.20}$$

Combining (3.19) and (3.20)

$$\Delta z_t = a_0 + a_1 t - \Pi z_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta z_{t-i} + \psi w_t + u_t \tag{3.21}$$

where,

$$u_t = \begin{pmatrix} u_{ty} \\ v_t \end{pmatrix}, \qquad a_0 = \begin{pmatrix} a_{0y} \\ a_{0x} \end{pmatrix}, \qquad a_1 = \begin{pmatrix} a_{1y} \\ 0 \end{pmatrix},$$

$$\Pi = \begin{pmatrix} \Pi_{0y} \\ 0 \end{pmatrix}, \qquad \Gamma_i = \begin{pmatrix} \Gamma_{iy} \\ \Gamma_{ix} \end{pmatrix}, \qquad \psi = \begin{pmatrix} \psi_y \\ \psi_x \end{pmatrix}$$

The intercept and the trend coefficients, a_{0y} and a_{1y}, are $m_y \times 1$ vectors; Π_y is the long run multiplier matrix of order $m_y \times m$, where $m = m_x + m_y$, Γ_{1y}, Γ_{2y}, ... , Γ_{p-1} are $m_y \times m$ coefficients matrices capturing the short run dynamics effects; and ψ_y is the $m_y \times q$ matrix of coefficients on the I(0) exogenous variables.
The models can be implied as follows;

Indonesia Model

$$
\begin{vmatrix} \Delta LICPI \\ \Delta LMR \\ \Delta LIWP \\ \Delta LIM_3 \end{vmatrix}_t = a_0 + a_{1t} - \Pi \begin{vmatrix} LICPI \\ LIMR \\ LIWP \\ LIM_3 \end{vmatrix}_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \begin{vmatrix} \Delta LICPI \\ \Delta LIMR \\ \Delta LIWP \\ \Delta LIM_3 \end{vmatrix}_{t-i} + \begin{vmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \end{vmatrix}_t
$$

Malaysian Model

$$
\begin{vmatrix} \Delta LMCPI \\ \Delta LMTBR \\ \Delta LMIP \\ \Delta LMM_3 \end{vmatrix} = a_0 + a_{1t} - \Pi \begin{vmatrix} LMCPI \\ LMTBR \\ LMIP \\ LMM_3 \end{vmatrix}_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \begin{vmatrix} \Delta LMCPI \\ \Delta MTBR \\ \Delta LMIP \\ \Delta LMM_3 \end{vmatrix}_{t-i} + \begin{vmatrix} u1 \\ u2 \\ u_3 \\ u_4 \end{vmatrix}_t
$$

The Philippines Model

$$
\begin{vmatrix} \Delta LPCPI \\ \Delta LPTBR \\ \Delta LPIP \\ \Delta LPM_3 \end{vmatrix} = a_0 + a_{1t} - \Pi \begin{vmatrix} LPCPI \\ LPTBR \\ LPIP \\ LPM_3 \end{vmatrix}_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \begin{vmatrix} \Delta LPCPI \\ \Delta LPTBR \\ \Delta LPIP \\ \Delta LPM_3 \end{vmatrix}_{t-i} + \begin{vmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \end{vmatrix}_t
$$

Singapore Model

$$
\begin{vmatrix} \Delta LSCPI \\ \Delta LSTBR \\ \Delta LSWP \\ \Delta LSM_3 \end{vmatrix}_t = a_0 + a_{1t} - \Pi \begin{vmatrix} LSCPI \\ LSTBR \\ LSWP \\ LSM_3 \end{vmatrix}_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \begin{vmatrix} \Delta LPCPI \\ \Delta LSTBR \\ \Delta LSWP \\ \Delta LSM_3 \end{vmatrix}_{t-i} + \begin{vmatrix} u \\ u_2 \\ u_3 \\ u_4 \end{vmatrix}_t
$$

Thailand Model

$$
\begin{vmatrix} \Delta LTCPI \\ \Delta LTMR \\ \Delta LTPP \\ \Delta LTM_3 \end{vmatrix}_t = a_0 + a_{1t} - \Pi \begin{vmatrix} LTCPI \\ LTMR \\ LTPP \\ LTM_3 \end{vmatrix}_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \begin{vmatrix} \Delta LTCPI \\ \Delta LTMR \\ \Delta LTPP \\ \Delta LM_3 \end{vmatrix}_{t-i} + \begin{vmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \end{vmatrix}_t
$$

EMPIRICAL RESULTS

Unit Root Test

Table 1, shows the results of a unit root test. A formal test of the null hypothesis of non-stationary was conducted using Augmented Dicky Fuller (ADF) test by using 25 lags with a constant and a time trend. All series are noted earlier are log transformed before the analysis. The null hypothesis of a unit root is rejected if the computed ADF test statistics is greater in absolute value than the critical value. From the table 1, columns 3, 4, 5, and 6 represented the test statistic for ADF test indicate that it does not exceed the critical value tabulated in Mc Kinnon (1994) at the 5 percent significance level.

All variables are then transformed to the first difference to eliminate the presence of unit root problem. The same ADF is applied to the first differences on all series, which indicated that it is possible to reject an I(2) specification at 5 percent significance level in all cases (Table 1). Columns 7, 8, 9 and 10 showed that the results of the test statistics are found to be greater for each of the series in their first difference.. Thus, the results indicate that for all series, after differencing do not contain a unit root and are first difference stationary.

Table 1: Unit Root Test

Country	Variables	Augmented Dicky Fuller Test (ADF)	
		Level	First Difference
		Trend	No Trend
	CPI	-1.742 [13]	-4.159* [12]
Indonesia	WP	-2.107 [5]	-5.140* [4]
	MR	-3.315 [8]	-8.450* [3]
	M3	-1.763 [4]	-11.575* [1]
	CPI	-2.738 [14]	-10.506* [1]
Malaysia	IP	-2.458 [14]	-5.077* [19]
	TBR	-2.259 [1]	-9.147* [2]
	M3	0.783 [14]	-3.073* [13]
	CPI	-1.382 [18]	-6.770* [21]
Philippines	IP	-1.080 [1]	-12.570* [1]
	TBR	-3.349 [1]	-9.581* [1]
	M3	0.063 [11]	-3.553* [5]
	CPI	-1.861 [20]	-3.829* [10]
Singapore	WP	-2.034 [6]	-7.841* [5]
	TBR	-2.197 [20]	-4.538* [20]
	M3	1.597 [20]	-3.712* [11]
	CPI	-2.093 [12]	-5.219* [4]
Thailand	TPP	-3.201 [3]	-5.307* [4]
	MR	-2.563 [1]	-11.806* [1]
	M3	-1.880 [1]	-4.872* [3]

Notes : Notes : CPI = Consumer Price Index, MR = Call Money Rate, TBR = 3-month T-Bill Rate, IP = Industrial Production, WP = Wholesale Price, PP = Production Price, M3 = Money Supply Asterisk (*) denote statistically significant at 5% level while (**) denotes statistically the variables are significant at 10% level, [ ] number of significance lagged that was determined by Akaike Information Criteria (AIC).

Johansen Cointegration Test

The multivariate cointegration technique developed by Johansen and Juselius (1990) is employed to the system of five variables, which are integrated of order one. The results of multivariate cointegration analysis reported in Table 2 indicate the null hypothesis of zero co-integrating vectors is rejected using the 95% critical value for all the five countries.

The results in Table 2 suggest that all countries show the λ-max and trace statistics values that are greater than the critical value, which allowed for rejection of the null hypothesis of no cointegration vector at the 5 percent significant level. The results of multivariate cointegrating regression conclusively indicate that all the variables are tied together by some long run equilibrium. These findings revealed the existence of a stable long run relationship between the five variables. This implies that although the five time series-variables may diverge from each other in the short-run, but they will most likely stay close to each other in the long run.

In summary, the Johansen-Juselius multivariate cointegration results indicated that all models with five variables included namely consumer price index (CPI); money market rate (MR) or 3-month T-Bill rate (TBR); industrial production (IP) or wholesale price (WP) or production price (PP); money supply (M3) and US T-Bill rate (USR) are co integrated within the system of five variables.

Table 2: Johansen Test for Multiple Cointegrating Vectors

Countries	K	λ-max(maximum eigenvalue statistics)					Trace statistics				
		Ho: r=0	Ho: r≤1	Ho: r≤2	Ho: r≤3	Ho: r≤4	Ho: r=0	Ho: r≤1	Ho: r≤2	Ho: r≤3	Ho: r≤4
Variables: CPI, MR, WP, M3 and L_USR											
Indonesia	2	42.88	24.32	5.77	3.86	2.74	79.57*	36.69	12.37	6.06	2.74
Variables: CPI, TBR, IP, M3 and L_USR											
Malaysia	3	35.08*	23.03	10.02	4.22	0.09	72.44*	37.36	14.33	4.31	0.09
Variables: CPI, TBR, IP, M3 and L_USR											
Philippines	2	45.6*	26.59	11.28	2.67	0.46	86.06*	41.0	14.41	3.13	0.46
Variables: CPI, TBR, WP, M3 and L_USR											
Singapore	2	36.44*	28.86	9.61	2.27	1.46	78.64*	42.20	13.34	3.73	1.46
Variables: CPI, MR, PP, M3 and L_USR											
Thailand	2	44.60*	18.60	9.80	6.05	0.36	79.45*	34.85	16.25	6.41	0.36
5% Critical Value		33.46	27.07	20.97	14.07	3.76	68.52	47.21	29.68	15.41	3.76

Notes: CPI = Consumer Price Index, MR = Call Money Rate, TBR = 3-month T-Bill Rate, IP = Industrial Production, WP = Wholesale Price, PP = Production Price, M3 = Money Supply and L_USR = US Rate. Asterisk (*) denotes statistically significant at the 5% level. K is defined as lagged length

Granger Causality in the VECM

From the Johansen cointegration test, it was shown that all five ASEAN countries namely as Indonesia, Malaysia, the Philippines, Singapore and Thailand have clear evidence of non-cointegration. Based on the presence of cointegrating vector in the Johansen-Juselius cointegration test, these ASEAN countries have one error correction term in each equation system. The ECM based tests with the first difference VAR's tests are presented in Table 3.

Table 3 in columns 2, 3, 4, 5 and Figure 1, indicate the causal relationship between the variables in the VECM framework. The result for consumer price index as a dependent variable showed that the hypothesis of non-causality from wholesale price and money supply is rejected at one percent significant level. It implies that wholesale price and money supply affects the consumer price index in the short-run. As evidence in the results, there is a bi-directional causality running from wholesale price to money supply. The results from causality test also show the causality from the US T-Bill rates to money supply and from money market rate to consumer price index. Money market rate (MR) and world interest rate (USR) do not influence consumer price index in the short run.

For example in the case of Malaysia, the result of granger causality tests based on the VECM is also summarized in Table 3 and Figure 1. Each equation for this model has a single error correction term based on Johansen cointegration test that found at most one cointegrating vector in the long-run relationship. The 3-month T-Bill rates (TBR), industrial production (IP) and money supply (M3) indicate that the coefficient of the lagged error correction is significantly different from zero. The p-value does not exceed one and five percent significant level. This implies that the domestic interest rate (TBR), industrial production (IP) and money supply adjust themselves in the long-run to equilibrate the relationship. Thus, these variables are considered as endogenous and they are the channels of short-run adjustment to the shock in long-run equilibrium relationships. Meanwhile, none of the error correction terms for the remaining equations are statistically significant. The coefficient of the lagged error correction for consumer price index (CPI) was negative but the p-value exceeded the 5 percent significant level, indicating that the null hypothesis of the zero error correction terms cannot be rejected. The consumer price index and US T-bill rate are found to be 'weakly exogenous' in the system. Therefore, these variables do not adjust to deviations from its long-run equilibrium relationships.

Again, table 3 in columns 2, 3, 4, 5 and Figure 1 show the causal relationship between the variable in the VECM framework The results show there is no bi-directional causality running at Malaysia model. The results from causality test show the causality from the US T-Bill rates affects all other variables in the VECM framework. This evidence showed that world interest rate does affect the outflow of money supply to equilibrate the short-run relationship. The result also showed that industrial production granger causes the money supply and world interest rates.

For the short-run causality channel, results clearly showed that there are only uni-directional relationship mainly from price production to world interest rates (USR) and money supply. These results indicate the importance of these financial variables for adjustment in the short-run equilibrium relationship. The domestic interest rates (MR) also statistically significant to Granger cause the price production (PP) in the uni-directional relationship. In this model, consumer price index does not Granger cause any of the variables Again this that, the null hypothesis of non-causality between the variables cannot be rejected. In the short term consumer price index (CPI) does not affect any of the variables to equilibrate the relationship but in the long-run money supply is responsible to bring back the system to the equilibrium.

Table 3 : Granger Causality Based on VECM

Dependent Variables	ΔLCPI	ΔLWP/ ΔLIP/ ΔLPP	ΔLMR/ ΔLTBR	ΔLIM3	ΔL_USR	ECT$_{-1}$	Normality	LM Test	ARCH Test
INDONESIA									
ΔLICPI	-	11.105(0.00)***	2.819 (0.24)	15.9 (0.00)***	3.082 (0.21)	-0.219 [-4.52]***	116.23 (0.00)***	1.86 (0.39)	8.73 (0.00)***
ΔLIWP	0.878 (0.64)	-	0.630 (0.72)	4.87 (0.08)*	3.133 (0.20)	-0.038 [-2.20]**	7092.04(0.00)***	2.05 (0.35)	5.48 (0.02)**
ΔLIMR	9.386 0.00)***	1.018 (0.60)	-	2.894 (0.23)	0.172 (0.91)	0.348 [3.77]***	3944.4 (0.00)***	2.14 (0.34)	0.08 (0.76)
ΔLIM3	5.237 (0.07)*	5.610 (0.06)*	0.323 (0.85)	-	0.092 (0.95)	-0.008 [-0.31]	3446.07 (0.00)***	2.65 (0.26)	1.60 (0.20)
ΔL_USR	0.878 (0.64)	0.065 (0.96)	0.630 (0.72)	4.879 (0.08)*	-	0.015 [0.62]	313.97 (0.00)***	1.91 (0.38)	0.25 (0.61)
MALAYSIA									
ΔLMCPI	-	4.633 (0.20)	2.710 (0.43)	2.332 (0.50)	1.32 (0.72)	-0.001 [-1.06]	170.13 (0.00)***	0.57 (0.74)	3.29 (0.06)**
ΔLMIP	3.090 (0.37)	-	0.292 (0.96)	8.007 (0.04)**	10.8 (0.01)***	0.034 [1.78]*	20.53 (0.00)***	0.51 (0.77)	0.28 (0.59)
ΔLMTBR	2.589 (0.45)	2.519 (0.47)	-	5.383 (0.14)	3.846 (0.27)	-0.078 [-3.03]***	606.92 (0.00)***	1.10 (0.57)	9.01 (0.00)***
ΔLMM3	1.619 (0.65)	3.984 (0.26)	1.952 (0.58)	-	1.169 (0.76)	-0.027 [-3.78]***	858.96 (0.00)***	4.96 (0.08)*	4.08 (0.04)**
ΔL_USR	8.598 (0.03)**	8.103 (0.04)**	7.267 (0.06)*	7.155 (0.06)*	-	0.016 [0.95]	247.12 (0.00)***	2.65 (0.26)	1.46 (0.22)
PHILIPPINES									
ΔLPCPI	-	1.240 (0.53)	10.32 (0.00)***	1.334 (0.51)	3.191 (0.20)	-0.012 [-3.27]***	1036.79 (0.00)***	1.08 (0.58)	26.29 (0.00)***
ΔLPIP	1.219 (0.54)	-	0.994 (0.60)	0.016 (0.99)	0.028 (0.98)	-0.000 [-0.02]	69744.8 (0.00)***	0.98 (0.61)	0.04 (0.82)
ΔLPTBR	2.065 (0.35)	20.82 (0.00)***	-	0.724 (0.69)	0.724 (0.69)	-0.099 [-2.93]***	385.51 (0.00)***	1.27 (0.52)	9.29 (0.00)***
ΔLPM3	0.333 (0.84)	0.076 (0.96)	3.590 (0.16)	-	0.120 (0.94)	-0.013 [-0.21]	1230.0 (0.00)***	0.08 (0.96)	4.93 (0.02)**
ΔL_USR	0.987 (0.61)	13.49 (0.00)***	7.654 (0.02)**	0.150 (0.92)	-	-0.085 [-5.16]***	141.32 (0.00)***	0.58 (0.74)	1.35 (0.24)
SINGAPORE									
ΔLSCPI	-	9.28 (0.00)***	3.433 (0.17)	2.954 (0.22)	5.32 (0.06)**	0.002 [0.77]	25.08 (0.00)***	0.31 (0.85)	28.11 (0.00)***
ΔLSWP	0.513 (0.77)	-	3.477 (0.17)	4.198 (0.12)	1.669 (0.43)	-0.019 [-1.32]	705.61 (0.00)***	5.61 (0.06)*	6.62 (0.01)***
ΔLSTBR	3.103 (0.21)	3.255 (0.19)	-	2.031 (0.36)	0.974 (0.61)	-1.201 [- .93]***	60.19 (0.00)***	2.30 (0.31)	2.27 (0.13)
ΔLSM3	1.591 (0.45)	1.453 (0.48)	0.145 (0.92)	-	1.216 (0.54)	-0.030 [-1.27]	5243.7 (0.00)***	0.42 (0.80)	7.14 (0.00)***
ΔL_USR	12.76 (0.00)***	3.164 (0.20)	5.635 (0.05)**	1.113 (0.57)	-	-0.158 [-3.61]***	230.6 (0.00)***	2.10 (0.34)	1.28 (0.25)
THAILAND									
ΔLTCPI	-	3.360 (0.18)	0.167 (0.91)	3.346 (0.18)	3.022 (0.22)	-0.028 [-3.77]***	92.93 (0.00)***	5.39 (0.06)*	0.32 (0.56)
ΔLTIP	4.281 (0.11)	-	3.058 (0.21)	8.124 (0.01)	4.639 (0.09)	0.015 [1.05]	217.7 (0.00)***	6.44 (0.03)**	0.46 (0.49)
ΔLTMR	2.068 (0.35)	6.196 (0.04)**	-	1.724 (0.42)	3.269 (0.19)	0.246 [0.63]	44.13 (0.00)***	3.23 (0.19)	14.59 (0.00)***
ΔLTM3	0.994 (0.60)	1.252 (0.53)	3.461 (0.17)	-	0.413 (0.81)	-0.087 [-4.21]***	143.0 (0.00)***	1.20 (0.54)	0.66 (0.41)
ΔL_USR	1.089 (0.58)	1.128 (0.56)	2.144 (0.34)	1.717 (0.42)	-	0.045 [0.57]	263.48 (0.00)***	1.04 (0.59)	1.58 (0.20)

Notes : ECT$_{-1}$ denotes the t-statistic of the error correction term. The χ^2-statistic for the best of joint significance of lagged X_t or Y_t in respective VECM equations. Figures in ( ) are p-values, whereas figures in [ ] are t-statistics. Asterisks (***), (**), (*) denotes statistically significant at the 1 percent, five percent and ten percent level respectively. The positive and significant ECT terms in the equation indicate the instability of the equation.

Impulse Response Functions

Another constructive way to describe the relationship between the variables in the vector error correction model (VECM) is through the Impulse Response Function (IRFs). The IRFs show the responses of the variables to innovations in each structural shock. It also measures the time profile of the effect of shocks on the future states of a dynamical system. In this case, we are using the orthogonalized impulse response (IR) function advanced by Sims (1980, 1981). Sims' approach employs the following Cholesky Decomposition of Σ (i.e.: the covariance matrix of the shocks u_t,

$$\Sigma = TT' \tag{4.1}$$

where T is a lower triangular matrix. Sims' simplified the equation as below;

$$E\,(\in_t \in'_t) = T^{-1}\,E(u_t u'_t)T'^{-1} = T^{-1}\,\Sigma\,T'^{-1} = I_m \tag{4.2}$$

and the new errors, $\in_t$, obtain using the transformation matrix T are now contemporaneously uncorrelated and have unit standard errors. In other words, the shocks $\in_t = (\in_{1t},\ \in_{2t},\ \ldots\ldots\in_{mt})'$ are orthogonal to each other. These orthogonalized impulse responses are not unique and in general depend on the particular ordering of the variables in the VAR. The orthogonalized responses are invariant to the ordering of the variables only if Σ is diagonal (or almost diagonal). The non-uniqueness of the orthogonalized impulse responses is also related to the non-uniqueness of the matrix T in the Cholesky Decomposition of Σ.

The graphs of Impulse Response Functions (IRFs) for Indonesian model are presented in Figure 1. The results showed a positive response for all other variables towards the innovations of money supply except for the market rate (domestic short-term interest rate) variable. The market rate showed positive responses on half of the forecast horizon, with maximum impact at 0.03. Subsequent to that, the response declines below the pre-shock level for a negative effect. It can also be seen that the negative impact does not shows immediately after the money shock. Hence, while the negative impact confirms the existence of liquidity effect on the Indonesian economy, it however takes some time to develop. The duration of the liquidity effect was in the economy until the end of the forecast horizon.

As was mentioned before this, the inclusion of foreign variables, USR rates as a world interest rate, is to capture the influence of the variables on the domestic interest rate. The coefficient of USR rates is expected to have a positive sign, indicating that as the world interest rate rises, capital outflow from the home country will tend to raise the domestic rate. The opposite result showed to the response of USR rates to innovations of money supply. The graph showed a positive response of USR rates towards the money supply innovations. The immediate positive response with the maximum impact at 0.01 was seen for the first five months of the forecast horizon. The effect was declining but still above the zero impact effect. The positive effect of foreign interest rates would increase the capital mobility of the country, therefore raising domestic interest rates, consequently reducing the size of liquidity effect. In the long term, the liquidity effect should be smaller relative to current situations.

As pointed out by Eichenbaum (1992), the issue of proper identification if examining the effect of money could solve monetary policy shocks on other variables in the system. In this analysis, another variables are the consumer price index (CPI) referred as a price level and wholesale price (WP) as an income of the country. For the CPI and WP, the results showed positive responses to innovations of money supply. The price response was positive from the beginning with a maximum impact at 0.02. The results obtained are not consistent with the Sims (1992) that detects a 'price puzzle' in his studies. The graph also illustrates the response of wholesale price (WP) to innovations of money supply. The result showed a positive sign immediately after a shock with the impact at 0.02. The effect was consistent after five months with a value at 0.03. The positive effects showed that the output was not significantly affected by money shocks in the short run. The result also indicated the response of money supply to innovations of domestic interest rate and world interest rate (USR rates). The result of the responses is not similar for the domestic interest rate, which showed a positive sign while foreign interest rates results were inconsistent. Money supply response positively to innovations of domestic interest rates which implies that an increase in money supply will decrease the domestic interest rate. The USR rates response negatively until below the pre-shock level, and then increased with the maximum impact at 0.001 before declining below the pre shock level within the forecast horizon.

Graph of Impulse Response Functions Test
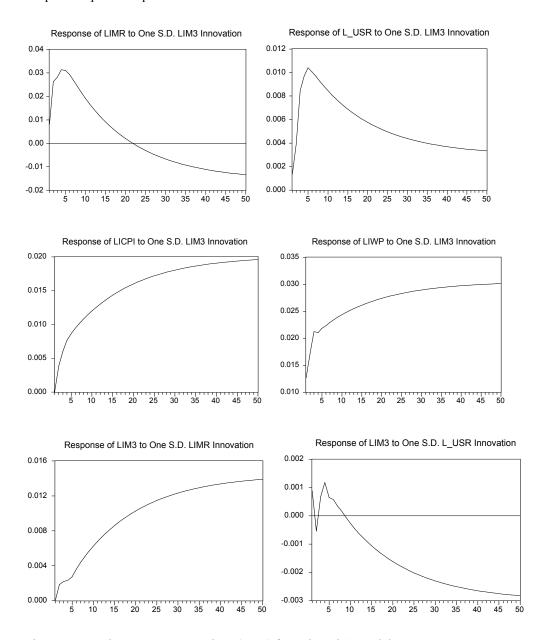
Figure 1: Impulse Response Functions (IRFs) for Indonesia's Model
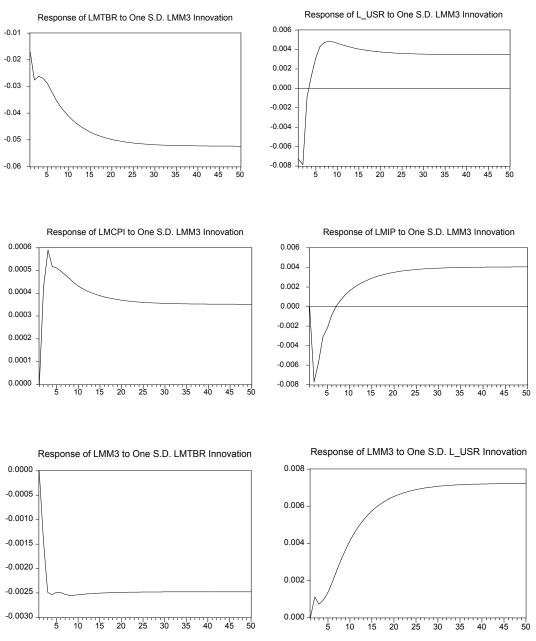
Figure 2: Impulse Response Functions for Malaysia's Model
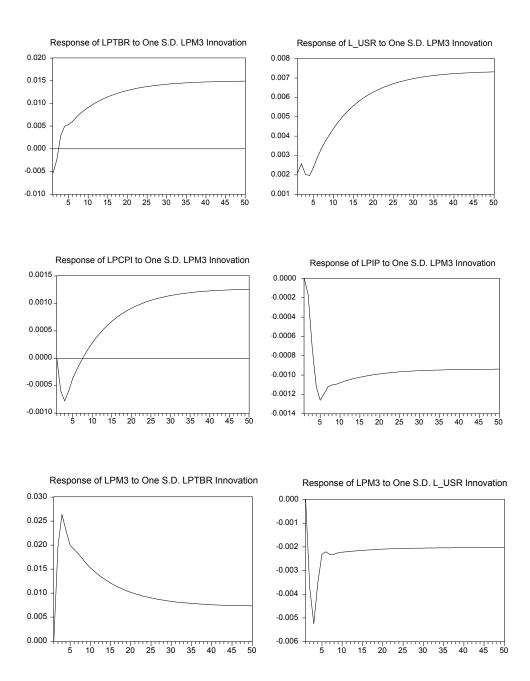
Figure 3: Impulse Response Functions for the Philippines Model
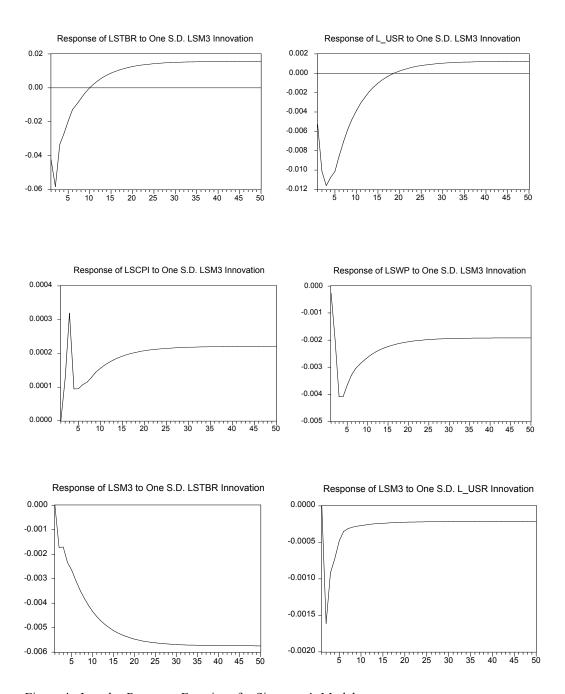
Figure 4: Impulse Response Functions for Singapore's Model
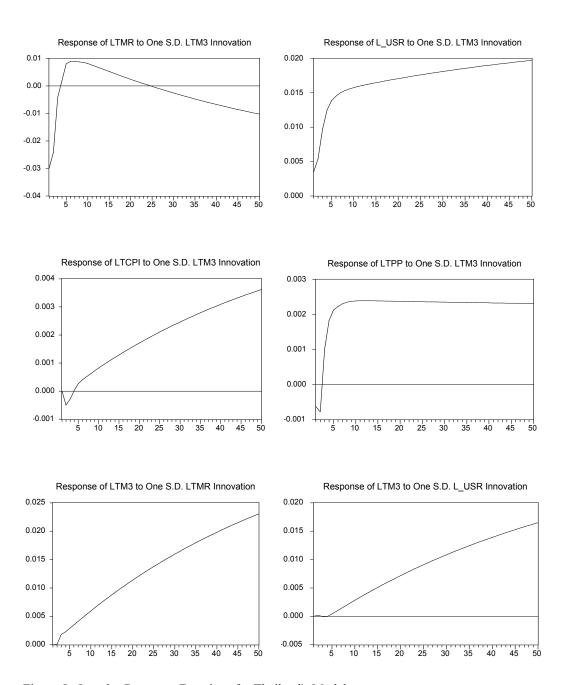
Figure 5: Impulse Response Functions for Thailand's Model

CONCLUSION AND POLICY IMPLICATIONS

This study has seek to examine the empirical evidence of the existence of liquidity effects in ASEAN countries, namely Indonesia. Malaysia, the Philippines, Singapore and Thailand, using data from 1983:01 to 2002:12. The estimated models for these countries utilized domestic interest rates, consumer price index, wholesale price or industrial production or price production, money supply and world interest rates (USR rates) as variables in evaluating the effects of monetary-shocks on the economy. Recent econometric tests including unit root test, cointegration analysis and vector error correction model was employed in this study.

In determining the presence of unit root problem using analysis of stationarity for the time series, it was found that each of the macro-economics variables in the models for ASEAN countries contains only one unit root, and thus integrated in order one, I(1) (Table 4.1). This implied that all these series under study were non-stationary in the level forms, but stationary in the first difference.

The Johansen cointegration test was then applied to determine the existence of a stable long run (equilibrium) relationship among the non-stationary time series variables and also to ascertain whether there is a long run (equilibrium) relationship between the relevant variables. The results suggested for all countries, null hypothesis of non-cointegration vectors can be rejected at the five percent significant level. The result of multivariate cointegration regression conclusively indicated that all the five ASEAN countries under study showed an existence of a stable long run (equilibrium) relationship among the non-stationary time series variables. In conclusion, the Johansen-Juselius multivariate cointegration estimation, indicated that all models with the five variables (consumer price index (CPI), call money rate (MR), 3-month T-Bill rate (TBR), industrial production (IP), wholesale price (WP), production price (PP), money supply (M3) and US T-Bill rate (USR)) were co-integrated within the system of five variables with at least one cointegration. For Singaporean economy, at least two cointegration vectors existed in the model.

Subsequently, the vector error correction model (VECM) to examine the effective adjustment towards equilibrium in the long run through significance or otherwise of the t-test of the lagged error correction terms (ect$_{-1}$) of the equations was also conducted. As mentioned previously, the Granger causality test based on VECM framework allows determining the short-run relationship and the impact of selected financial variables within the ASEAN economics model.

As a conclusion, the short-run causality channel showed that consumer price index and money supply are not the important variables that equilibrate the system equation in the short-run. The result only reveal for the Philippines, Singapore and Thailand's model. From the Granger Causality Based on VECM,

This study had shown negative effect exhibiting of interest rates in most of the countries although different patterns and time profiles. Four countries (Malaysia, the Philippines, Singapore and Thailand) gave immediate responses to a money shock, with Malaysia showing the longest duration of effect, followed by Singapore and the Philippines. Singapore's negative impact occurred for ten months before changing into a positive impact. The impact changed might be due to the positive effect of world interest rate due to a shock in money supply. The positive impact occurred after ten months and explaining why the existence of liquidity effect in Singapore was longer than in the Philippines. The negative impact in the Philippines occurred for less than five months, the shortest existence of liquidity effect among the ASEAN countries studied. This might be due that the world interest rate did give a positive response to a shock in money supply. The findings for Thailand gave an interesting time profile for this case of the existence of a liquidity effect. The immediate negative response occurred for less than five months, followed by a positive impact for about twenty months and reverting back to a negative impact at the end of forecast horizon. The response was not consistent with the theory, which could result in a higher capital mobility to the country for a positive response of world interest rate. The results were contrary for Malaysian economy where the positive response of world interest rate does affect the capital mobility of the country.

POLICY IMPLICATION

The results of our analysis point out several facts that need to be considered in formulating monetary policies in developing countries. The empirical results seems to suggest that money supply and domestics interest rates of the countries play an important role in the monetary economics of a country. World interest rate could equilibrate the system equation when there is an increased in the interest rate.

Through containing inflation that take place when the price level does not adjust instantaneously, a liquidity effect occurs resulting in declining real interest rates in response to a monetary expansion. However for some cases, the failure of the price level to adjust immediately to its new long run equilibrium also produces expectations of inflations. The reasonable interest rate may be a difficult to target to achieve and maintain, given the need for the banking sector to operate high lending spreads under inflationary conditions, with high liquidity and high reserve requirements.

The issue of which policy instruments and target variables to use becomes increasingly complicated in an open economy. Countries with a weak financial sector should first strengthen their domestic financial institutions, improve regulatory capacity and only gradually implement reform. This means, above all, that there should be investment in people and skills to build efficient institutions capable of managing the new liberalized financial system. In an open economic system, banking institutions should be required to make timely and transparent disclosures to investors, including details of their non-performing loan portfolio.

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REFERENCE

Ahamed Kamel Meera, Niranjan Tirapathy, Michael R. Redferns, Wealth and   Liquidity Effects of Stock Delistings: Empirical Evidence from the Stock Exchanges of Singapore and Malaysia, *Applied Financial Economics*, 2000, p: 199 – 206.

A.R Pagan and J.C Robertson, Models of the Liquidity Effect, *Review of Economics and Statistics*, 1992.

A. R. Pagan, Models of the Liquidity Effect, *Review of Economics and Statistics*, 1998, p: 202

A.R Pagan and J.C Robertson, Structural Models of the Liquidity Effect, *Review of Economics & Statistics*, May, 1998, Vol. 80, Issue 2.

Ben Fung, Rohit Gupta, Searching for the Liquidity Effect in *Canada, working paper 94 – 12*, Department of Monetary Financial Analysis, Bank of Canada, 1994.

Benjamin J. C. Kim, Noor A. Ghazali, The Liquidity Effect of Money Shocks on Short Term Interest Rates: Some International Evidence, *International Economics Journal*, November, 1998

Bernanke, Ben and Blinder, Alan, The Federal Funds Rate and the Channels of Monetary Transmission, *American Economic Review*, September 1992, p: 901 - 921

Chien-Chung Nieh, The Effect of the Asian Financial Crisis on the Relationships Among Open Macroeconomic Factors for Asian Countries, *Applied Economics,* 2002, p: 491 – 502

Christiano, Lawrence. J., Modelling the Liquidity Effect of a Monetary Shock, Federal Reserve Bank of Minneapolis, *Quarterly Review*, Winter 1991, p:3 - 34

Christiano, Lawrence. J and Eichenbaum, Martin, Liquidity Effects and the Monetary Transmission Mechanism, *American Economic Review*, May 1992, p: 346 - 353

Christiano, Lawrence J, Modelling the Liquidity Effect of a Money Shock, Federal Reserve Bank of Minneapolis, *Quarterly Review*, 1991

Cochrane, John. H., The Return of the Liquidity Effect: A Study of Short Run Relation Between Money Growth and Interest Rates, *Journal of Business and Economics Statistics*, January 1989, p: 75 – 83

Dicky, D. and Fuller, W., Distribution of the Estimators for Time Series Regression with a Unit Root, *Journal of the American Statistical Association*, 1979, p: 427 – 431

Don Bredin, Keith Cuthbertson, Liquidity Effect and Precautionary Saving in the Czech Republic, *Applied Economics Letter*, 2002, p: 405 - 413

Eichenbaum, Martin and Evans, Charles L., Some Empirical Evidence on the Effects of Shocks to Monetary Policy on Exchange Rates, *Quarterly Journal of Economics*, September 1995, p: 975 - 1009

Eric M. Leeper and David B. Gordon, 1992, In Search of the Liquidity Effect, *Journal of Monetary Economics*, p:341 - 369

Friedman, Milton, The Role of Monetary Policy, *American Economic Review*, 1968, p: 3 – 17

Fuerst, Timothy, Liquidity, Loanable Funds and Real Activity, *Journal of Monetary Economics*, January 1992, p: 3 - 24

Gali, Jodi, How Well Does the IS-LM Model Fit Postwar U.S Data*?, Quarterly Journal of Economics*, May 1992, p: 709 – 738

Gazi H. Shabikat, The Liquidity Effect and the Transmission Mechanism of Money, *Applied Economics Letter*, 2001, p: 779 - 785

Gregory E. Goering, Michael K. Pippenger, A Note Regarding ARCH and Threshold Process: Results from A Monte Carlo Study, *Applied Economics Letters*, 1994, p: 210 – 213

Gujarati D.N, Basic Econometrics (Third Edition), *Mc Graw Hill International   Edition,* 1995

Hamilton James D., Measuring the Liquidity Effect, *American Economic Review*, March, 1997

John Huizinga, Frederic S. Mishkin, Inflation and Real Interest Rates on Assets with Difference Risk Characteristics, *Journal of Finance*, July 1984, p: 699 - 711

Jordi Gali, How Well Does the IS-LM Fit Postwar U.S Data?, *Quarterly Journal of Economics*, May 1992

Junxi Zhang, Liquidity, Transaction Costs and Real Activity, *Southern Economic Journal*, 1998 p: 308 - 321

Kevin B. Grier and Mark J. Perry, The Effect of Money Shocks on Interest Rates in the Presence of Conditional Heteroscedasticity, *The Journal of Finance,* Vol. XLVIII, No. 4, Sept 1993.

Kim, Benjamin J.C and Ghazali, Noor A., Has the Liquidity Effect of Money Shocks n Interest Rates Really Vanished?: Further Evidence on the Liquidity Effect, mimeo, Department of Economics, University of Nebraska-Lincoln, 1996

Lastrapes, W.D., G. Selgin, The Liquidity Effect: Identifying Short-Run Interest Rate Using Long-Run Restrictions, working paper, 1994, University of Georgia, Departments of Economics.

Lastrapes and William D., The Dynamic Effects of Money: Combining Short-run and Long-run Identifying Restrictions Using Bayesian Techniques, *Review of Economics and Statistics,* Vol. 8, Issue 4,   Nov 1998

Leeper, Eric and Gordon, D,. In Search of the Liquidity Effect, *Journal of Monetary Economics*, April 1990, p: 341 - 369

Lee Ohanian, Alan Stockman, Theoretical Issues of Liquidity Effects, Federal Reserve Bank of St. Louis, May/Jun 1995

Lucas, Robert E., Liquidity and Interest Rates, *Journal of Economics Theory*, April 1990, p: 237 - 264.

Martin Eichenbaum, Charles L. Evans, Some Empirical Evidence on the Effects of Shocks to Monetary Policy on Exchange Rates, *Quarterly Journal of Economics*, November, 1995

Mc Kinnon J., 1991, Critical Values of Cointegration Test, *Oxford University Press,* New York

Melvin, Michael, The Vanishing Liquidity Effect of Money on Interest: Analysis and Implications for Policy, *Economic Inquiry*, April 1983, p: 188 – 202

M. Hashem Pesaran, Yongcheol Shin, Cointegration and Speed of Convergence to Equilibrium, *Journal of Econometrics*, 1996, p:117 – 143

Michael Dotsey and Peter Ireland, Liquidity Effects and Transaction Technologies, *Journal of Money, Credit and Banking,* 1995, Vol. 27, No 4, Part 2.

Michael T. Bond, A Note on Liquidity Effects on Long and Short-term Interest Rates, *American Business Review,* Jan1990.

Mishkin, Frederic S., Monetary Policy and Long Term Interest Rates: An Efficient Markets Approach, *Journal of Monetary Economics*, 1981, p : 29 – 55

Mishkin, Frederic S., The Economics of Money, Banking an Financial Markets, Harper Collins, 1992

Ohanian, L.E., Stockman, A.C., Short-Run Effects of Money When Some Prices are Sticky, *Federal Reserve Bank of St. Louis Review*, 1995, p: 3 – 25

Pesaran & Pesaran, Microfit 4.0, Oxford University Press, 1997

Philip Hans Franses, Time Series Models for Business and Economic Forecasting, Cambridg University Press, 1998

Piya-Oui, Panita, Felix Ayadi, O., The Puzzling Effect of Money Shocks on Interest Rates, *Journal of Applied Business Research*, Spring 1996

Rumi Masih and Abul M.M Masih, Macroeconomic Activity Dynamics and Granger Causality: New Evidence from a Small Developing Economy Based on a Vector Error Correction Modeling Analysis, *Economic Modeling,* vol. 13, Issue 3, July 1996, p 407 - 426

Reichenstein, W., The Impact of Money on Short-Term Interest Rates, *Economic Inquiry*, 1987, p: 67 – 82

Robert E. Lucas Jr., Liquidity and Interest Rates, Department of Economics, University of Chicago, April 1989

Rossiter R. D., Identifying Credit and Liquidity Effects Using a Rank Condition, *Applied Financial Economics*, 1998

Rotermberg, Julio, A Monetary Equilibrium Model with Transaction Costs, *Journal of Political Economy*, February 1984, p: 40 – 58

Said Elfakhani, Short Positions, Size Effect and the Liquidity Hypothesis: Implications for Stock Performance, *Applied Financial Economics*, 2000

Sims, Christopher A., Seasonality in Regression, *Journal of the American Statistical Association*, 1974, p: 618 – 626

Sims, C., Interpreting the Macroeconomic Time Series Facts: The Effects of Monetary Policy, *European Economic Review*, 1992, p: 975 – 1000

Strongin, S., The Identification of Monetary Policy Disturbances: Explaining the Liquidity Puzzle, *Journal of Monetary Economics*, 1995, p: 463 – 497

Tarhan, V. Does the Federal Reserve Affect Asset Prices?, *Journal of Economic Dynamics and Control*, 1995, p: 1199 – 1222

Timothy S. Fuerst, Liquidity, Loanable Funds and Real Activity, *Journal of Monetary Economics*, September 1991

Thomas Urich and Paul Wachtel, The Effects of Inflation and Money Supply Announcements on Interest Rates, *The Journal of Finance,* Vol. XXXIX, No. 4, Sept 1984

T.H. Root and D. Lien, Impulse Responses in a Threshold Cointegrated System, The Case of Natural Gas Markets, *Applied Financial Economics,* 2003, p: 23 – 35.

Walter Wasserfallen, Guido Kursteiner, Interest Rates and Exchange Rates under Money Supply Targets (The Swiss Evidence), Elsevier Science, 1994

Wilbur John Coleman II, Christian Giles, Pamela Labadie, The Liquidity Premium in Average Interest Rates, *Journal of Monetary Economics*, 1992

William E. Gibson, Interest Rates and Monetary Policy, *Journal of Political Economics,* 2001.

APPENDIX I

Estimated of Error Correction Model for ASEAN Countries

A. Indonesia

ΔICPI = 0.0040 + 0.4150ΔICPI(-1) - 0.07406ΔICPI(-2) + 0.0486ΔIM3(-1) - 5.4509e-05ΔIM3(-2)
        (4.7909)*** (5.499)***   (-1.143)   (3.915)***   (-0.0043)

+ 0.0026ΔIMR(-1) - 0.0049ΔIMR(-2) + 0.07607ΔIWP(-1) + 0.0233ΔIWP(-2) + 0.0025ΔUSR(-1)
  (0.7573)   (-1.4332)   (3.2629)***   (1.0230)   (0.1984)

+ 0.02099ΔUSR(-2) - 0.02196I_ECT$_{t-1}$
  (1.5252) (-4.5263)***

B. Malaysia

ΔMCPI = 0.0017 + 0.2088ΔMCPI(-1) - 0.0082ΔMCPI(-2) + 0.0006ΔMCPI(-3) + 0.0164ΔMM3(-1) + 0.0096ΔMM3(-2)
        (4.1455)*** (3.0089)***   (-1.2498)   (0.0089)   (1.2684)   (0.7432)

- 0.0033ΔMM3(-3) - 0.0049ΔMTBR(-1) + 0.0050ΔMTBR(-2) - 0.0017ΔMTBR(-3) + 0.0671ΔMIP(-1) - 0.0017ΔMIP(-2)
  (-0.2585)   (-1.3848)   (1.3330)   (1.0230)   (1.2249)   (-0.2872)

- 0.0061ΔMIP(-3) - 0.0011ΔUSR(-1) + 0.0020ΔUSR(-2) - 0.0061ΔUSR(-3) - 0.0014M_ECT$_{t-1}$
  (1.2659)   (-0.2181)   (0.3437)   (-1.0957)   (1.0672)

C. The Philippines

ΔPCPI = 0.0036 + 0.5158ΔPCPI(-1) + 0.0223ΔPCPI(-2) - 0.0036ΔPM3(-1) + 0.0002ΔPM3(-2)
        (4.0239)***   (7.4174)***   (0.3321)   (-1.1119)   (1.2684)

+ 0.0231ΔPTBR(-1) - 0.0022ΔPTBR(-2) + 0.0004ΔPIP(-1) - 0.0071ΔPIP(-2) - 0.0199ΔUSR(-1)
  (3.1506)***   (-0.2862)   (0.0678)   (-1.0745)   (-1.2421)

- 0.00141ΔUSR(-2) - 0.0122 P_ECT$_{t-1}$
  (-.08550)   (-3.2771)***

D. Singapore

ΔSCPI = 0.0012   - 0.0735ΔSCPI(-1) + 5.6400e-05ΔSCPI(-2) + 0.0080ΔSM3(-1)   + 0.0152ΔSM3(-2)
           (4.2753)***   (-1.1046)   (0.0008)   (0.8792)   (1.6711)*

+ 0.0002ΔSTBR(-1) - 0.0013ΔSTBR(-2) + 0.0450ΔSWP(-1) - 0.0078ΔSWP(-2)   + 0.0067ΔUSR(-1)
   (0.2250)   (-1.7453)*   (3.0199)***   (-0.5107)   (1.2803)

+ 0.0069ΔUSR(-2)   +   0.0025 S_ECT$_{t-1}$
   (1.3502)   (0.7707)

continue

E. Thailand

ΔTCPI = 0.0031   + 0.1300ΔTCPI(-1) - 0.1386ΔTCPI(-2) - 0.0401ΔTM3(-1)   + 0.0245ΔTM3(-2)
            (5.5257)***   (1.7301)*   (-1.8525)*   (-1.5734)   (0.9583)

+ 0.0004ΔTMR(-1) + 0.0004ΔTMR(-2) + 0.0605ΔTPP(-1) + 0.0147ΔTPP(-2)   - 0.0036ΔUSR(-1)
   (0.3076)   (0.3104)   (1.5854)   (-0.3818)   (-0.5957)

+ 0.0111ΔUSR(-2)   -   0.0289 T_ECT$_{t-1}$
   (1.7334)*   (-3.7710)***

Figures in ( ) are p-values, whereas figures in [ ] are t-statistics. Asterisks (***), (**), (*) denotes statistically significant at the 1 percent, five percent and ten percent level respectively.

APPENDIX II

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)					
Country			Equation(s)		
Indonesia	LICPI	LIM3	LIMR	LIWP	L_USR	C
	1.000000	-0.054489	-0.310090	-0.748003	0.198894	1.208875
		(0.06907)	(0.15909)	(0.11713)	(0.09389)	
Malaysia	LMCPI	LMM3	LMTBR	LMIP	L_USR	C
	1.000000	1.442306	0.095291	-2.464730	-0.133606	-30.93863
		(2.65239)	(0.15813)	(3.92999)	(0.22770)	
The Philippines	LPCPI	LPM3	LPTBR	LPIP	L_USR	C
	1.000000	-0.045019	0.362449	-0.506069	9.07E-05	2.117069
		(0.03304)	(0.11876)	(0.07095)		
Singapore	LSCPI	LSM3	LSTBR	LSWP	L_USR	C
	1.000000	-0.041000	0.142430	0.764243	-0.150831	-6.908499
		(0.07354)	(0.07931)	(0.51335)	(0.09023)	
Thailand	LTCPI	LTM3	LTMR	LTPP	L_USR	C
	1.000000	-0.144511	-0.031161	-0.609214	-0.032884	2.442032
		(0.03169)	(0.01462)	(0.12143)	(0.01978)	

Figures in ( ) are t-statistics

Development for Knowledge Based Economy:
A Cross Countries Comparison

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ABSTRACT

This paper investigated the knowledge development of nine selected countries; in the two categories of developed and emerging economies, in their transition towards Knowledge-based economy (K-economy). The performances of the selected countries are evaluated by two means, namely, the radar charts and Data Envelopment Analysis (DEA). The first analysis shows that developed countries have accumulated more knowledge stock. They have also shaped a better resource environment relative to emerging countries. On the other hand, the DEA score indicates that four of the small countries (as measured by total population); Finland, Malaysia, Singapore and South Korea, are relatively more efficient in promoting and developing K-economy when compared to large economic giants like the US and Japan, and also other peers which are less developed in term of GNI per capita.

INTRODUCTION

While developed nations have long well known of their knowledge-driven industries, for emerging countries however, the emphasis on Knowledge-based economy (K-economy) only started less than a decade ago. Ever since the break off of the recent Asian financial crisis, many emerging markets, especially those in East Asia region have experienced a less encouraging growth environment. The destructed growth in the emerging economies has causes difficulty in their economic development in regaining what they have achieved prior to the crisis. As a result, most of them have begun to seek for alternative growth paths; one of which is to take a ride on the K-economy bandwagon, and opting for another successful "Asia miracle".

The concept of K-economy emerged as a resolution to the growth bottleneck faced by the conventional Production-based economy (P-economy). K-economy is perceived as a new growth generator that is believed to be able to sustain the next wave of industrial revolution. In short, K-economy is just a result from a fuller recognition of the role of knowledge and technology in economic growth (OECD, 1996). In K-economy, traditional factors of production such as land, labor and capital are still very important, but instead of these traditional inputs, knowledge now constitutes the primary engine of growth. What makes the paradigm shift from P-economy to K-economy is the incorporation of knowledge (measured by innovation and technology) to reshape and rebuilt the traditional factors of production. Concisely, knowledge brings value added to the traditional factor of production.

The main purpose of this paper is to investigate the knowledge development of the nine selected countries, which is a combination of developed and emerging economies, in their transition towards K-economy. The performances of the selected countries are evaluated by two means, namely, the radar charts and Data Envelopment Analysis (DEA). The first analysis serves to compare the knowledge stock and monetary resources devoted in these countries to develop K-economy. The second analysis, which is based on the DEA scoring, gauges the relative efficiency of the selected countries in promoting and generating knowledge outputs from the available resources.

DATA AND METHODOLOGY

Data and Descriptive Statistics

This study compares nine selected countries in areas relevant to K-economy. The US, Finland, Japan and Singapore are selected as representative models for K-economy development in the respective continents of America, Europe and Asia. The US and Finland are the most progressive countries in promoting K-economy.[1] Japan and Singapore on the other hand, represent the Asian best practice in K-economy. Four of the remaining countries in our sample are Korea, Malaysia, Philippine and Thailand. For the past few years, these countries have been actively taken on various developments for the transition towards K-economy. In addition, we also include China in our analysis seeing that this economic giant has the potential to becoming one of the worlds' leading economies in the near future.

The sample countries are grouped into two – developed versus emerging, to ease the discussion and comparison in the rest of this paper. The terms 'country's size' and 'level of development' will constantly be used henceforth, referring to total population and GNI per capita respectively. The countries' profile is presented in Table 1:

Table 1: Country Profile in 2001

	Population (million)	Labor Force (million)	GDP (billion USD)	GNI per capita (USD)
Developed Countries				
Finland	5.2	2.6	120.9	23,780
US	285.3	146.7	10,100	34,400
Japan	127	68.2	4,100	35,610
Korea	47.3	24.3	427.2	9,490
Singapore	4.1	2.0	84.9	21,100
Developing Countries				
China	1,300	763.2	1,200	890
Malaysia	23.8	10.0	88	3,400
Philippines	78.3	33.3	71.4	1,030
Thailand	61.2	37.2	115.3	1,960

Source: Development Data Group, World Bank

In the transition towards K-economy, there are various indicators to measure knowledge stock of an economy. They are commonly known as Knowledge output (K-output) and these indicators are important to designate and quantify knowledge development of a country. The k-outputs are listed in Table 2. For a comprehensive analysis, this study also included a set of variables which measures the sources and supports for the knowledge development. They are known as knowledge-input (k-input). The first two k-outputs (High-Technology Export and Scientists & Engineers) represent technology creations which indicate innovation strength in generating knowledge. The rest of the k-outputs are all ICT infostructure to signify the knowledge facilities available or achieved by the knowledge society. The k-inputs serve to gauge the supporting environment for knowledge development in each country. All the variables are obtained from the Development Data Group of World Bank.

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[1] Finland and the US were ranked first and second respectively in world's latest Growth Competitiveness Index (GCI) in 2003. GCI is inclusive of a technology sub index, where both countries were also ranked the top (the first is the US and Finland the second), showing that they are the best in providing ICT diffusion and creation. The GCI include 102 countries in the world and they account for 97.8 percent of world's GDP in 2003.

Table 2: List of K-outputs and K-inputs, and the Unit of Measurement

K-outputs	Unit of Measurement
1. High- Technology Export	billion in 1999
2. Scientists & Engineers in R&D	per million people in 2002
3. Number of Personal Computers	PC per 1000 people in 2001
4. Number of Internet Host	per 1000 people in 2001
5. Telephone Main Lines	per 1000 people in 2001
6. Mobile Telephones	per 1000 people in 2001
7. Labor Productivity	USD per person in 2001
8. International Telecommunications	outgoing traffic by minutes per subscriber in 2001
K-inputs	
1. Labor force	million in 2001
2. Gross Domestic Product	billion USD in 2001
3. Gross Capital Formation	billion USD in 2000
4. Total expenditure on ICT	million USD per capita in 2001
5. Services value added in GDP	billion USD in 2001

The descriptive statistics for all the k-outputs and k-inputs are summarized in Table 3. It is observed that the standard deviations for all the k-inputs and k-outputs are huge. The differences between the maximum and minimum values of the data are also very big, meaning that each country differs greatly in technology diffusion and creation. This is quite obvious, as the selected nine-countries are at the different stages of knowledge development, and thus having significantly varied supportive knowledge environments.

Table 3: Summary of Descriptive Statistics for K-outputs and K-inputs of the Nine Selected Countries

K-outputs	Telephone Main Lines	Mobile Telephones	Int. Telecom	Number of PC	Number of Internet Host	Scientists and Engineers	High Technology Export	Labor Productivity
Mean	356.13	368.49	159.26	261.86	30289.37	2405.22	63.00	34076.13
Std. Dev.	242.50	272.09	239.56	228.09	46186.63	2212.26	64.50	22827.87
Maximum	664.50	720.40	778.30	625.00	142823.00	5095.10	206.00	72517.50
Minimum	40.00	50.40	10.70	19.00	1500.00	73.80	9.00	6999.30

K-inputs	Labor Force	GDP	Services Value Added in GDP	Expenditure on ICT	Gross Capital Formation
Mean	120.82	1811.97	1229.33	151013.44	426.90
Std. Dev.	245.08	3371.60	2482.01	281087.69	722.31
Maximum	763.24	10100.00	7423.50	812635.00	2121.00
Minimum	2.04	71.40	37.31	3131.00	12.57

Note: Int. Telecom - International telecommunications by outgoing traffic (minutes per subscriber), Std. Dev. – standard deviation

This study employed two different methods to examine the performance of the selective countries in promoting the k-indicators, or k-outputs. Under the first method, a series of radar charts is illustrated; whereas under the second method, a relative efficiency rating determined through the Data Envelopment Analysis (DEA) is presented. The radar charting method is frequently used in many K-economy related reports; see for examples in OECD (1996) and KBE Master Plan (2002). It is a simple and clear way of comparing the k-indicators. For the purpose of scaling down, the quantities of the k-indicators are normalized to percentage (100%) scores. The scores are then plotted on a radar chart for comparison. The DEA model, on the other hand, is an established method to examine the relative efficiencies under study using multiple inputs and outputs. More detail discussion of the method is provided in the next section.

Data Envelopment Analysis

Data Envelopment Analysis is a non-parametric linear programming technique developed by Charnes, Cooper and Rhodes in 1978. Cooper et al. (2004) gives a comprehensive discussion on DEA and its uses in different countries. DEA is a multiple inputs and multiple outputs way of measuring efficiency, and it is very well known for its powerful analytical ability and has been widely used to assess the operating efficiency of commercial banks, non-profit organizations and government agencies, including universities, hospitals and airports. However, the approach is not yet widely applied at the state or country levels, so far have only identified three studies of this kind in the literature. The first study was preented by Taskin and Zaim (2001), where DEA is applied to construct an environmental efficiency indexes for a group of high-income and low-income and middle-income countries. Ali et al. (1993), and Ali and Nakosteen (2003), in the other two studies, used DEA to provide rankings of inter cities and inter states economic performances, respectively.

DEA establishes a relative scoring system leads by the benchmark efficiency score of unity. This is the highest score that none of the individual Decision Making Unit (DMU), the country, in our study, can exceed. In other words, the most efficient DMU or DMUs may score a value between zero and unity. The purpose of DEA hence is to constructure a nonparametric envelop frontier over the data points such that all observed DMUs lie on or below the production frontier. DEA then determine which particular unit operates on the efficiency frontier and which unit does not. The optimization procedure in DEA ensures that a particular DMU being evaluated is given highest possible score by maximizing its relative efficiency ratio, at the same time maintaining equity for all other DMU.

The relative efficiency model of E_K (efficiency score), for *k*-countries, is given as follows:

$$E_K = \frac{\sum_{j=1}^{n} V_{jk} Y_{jk}}{\sum_{i=1}^{m} U_{ik} X_{ik}} \tag{1}$$

Where Y_{jk} and X_{ik} denote the *j*-th k-output and *i*-th k-input respectively for *k*-countries (the k-th DMU). V_{jk} and U_{ik} are the weight placed on the *j*-th k-output and *i*-th k-input respectively and $\sum_{j=1}^{n} V_{jk} = \sum_{i=1}^{m} U_{ik}$ for all *k* (*k*=1,2,…9). The weights are assumed to be uniform across the k-input and k-output. Transforming the model into the linear fractional programming problem, now the focus is to seek for solving the normalized E_K, that is e_K:

$$\text{Maximizing } e_K = \sum_{j=1}^{n} V_{jk} Y_{jk} \tag{2}$$

Subject to the constraints of:

- $\sum_{i=1}^{m} U_{ik} X_{ik} = 1$

- $$\sum_{j=1}^{n} V_{jk} Y_{jk} - \sum_{i=1}^{m} U_{ik} X_{ik} \leq 0$$

- $$V_{jk} \geq 0, \quad j = 1, 2, \ldots, n$$

- $$U_{ik} \geq 0, \quad i = 1, 2, \ldots, m$$

- $$\sum_{j=1}^{n} V_{jk} = \sum_{i=1}^{m} U_{ik}$$

As a whole, the optimization procedure in DEA serves to ensure that the particular DMU being evaluated is given the highest score possible by maximizing its relative efficiency ratio, at the same time maintaining equity for all other DMUs.

With the five k-inputs, we further identified them as controlled and uncontrolled inputs. For controlled k-inputs, necessary improvement (reduction) in terms of increment or reduction can be suggested once inefficiency is detected, while for uncontrolled k-inputs, no further improvement can be suggested. The controlled k-inputs include the total expenditure on ICT, and services value added in GDP; whereas the uncontrolled k-inputs consist of labor force, GDP, and gross capital formation.

RESULTS AND DISCUSSION
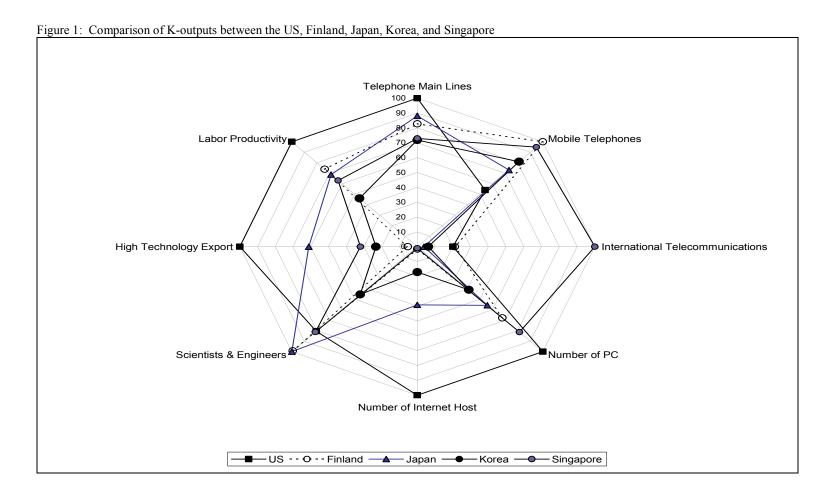
Radar Chart Analysis
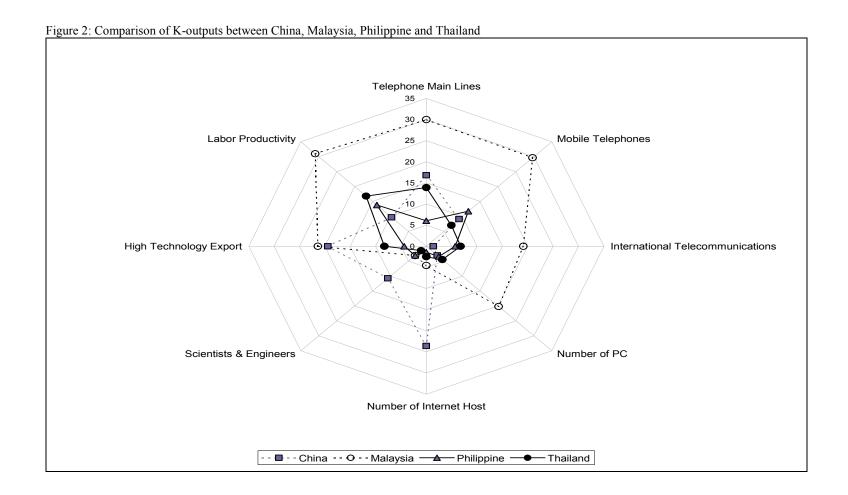
The radar chart is plotted based on the calculated scores of various k-indicators (k-outputs) and k-inputs. The calculation is done by normalizing the raw values of all the variables to percentage scores. Figure 1 and Figure 2 portray the charts of k-indicators; while Figure 3 and Figure 4 illustrate the charts of k-inputs. The first set of radar charts compare the relative development status of the countries; developed (the US, Finland, Japan, Korea, and Singapore) and emerging countries (China, Malaysia, Philippine and Thailand) while the second set of radar charts are grouped by country's size; large (US, Japan, and China) and small countries (Finland, Korea, Malaysia, Philippine, Singapore and Thailand).
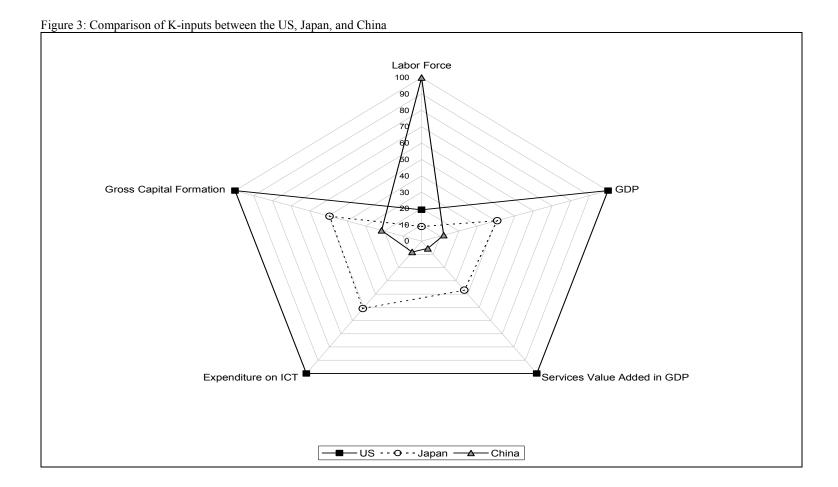
Figure 1 shows the comparison of k-outputs among the developed countries while the comparison for the emerging markets is shown in Figure 2. In general, this first set of radar charts suggest that the ICT technology diffusion and creation in emerging markets (Figure 2) are far below than that of the developed countries (Figure 1) in most instances. Apparently, the US is leading in almost all of the selected k-outputs, except in three cases. Japan on the other hand, has the most number of scientists and engineers in R&D per million people, while Finland dominates the subscriber of mobile telephones per 1000 people. For outgoing traffic in international telecommunications, Singapore tops the ranks. Among the emerging countries, Malaysia is the best performer.
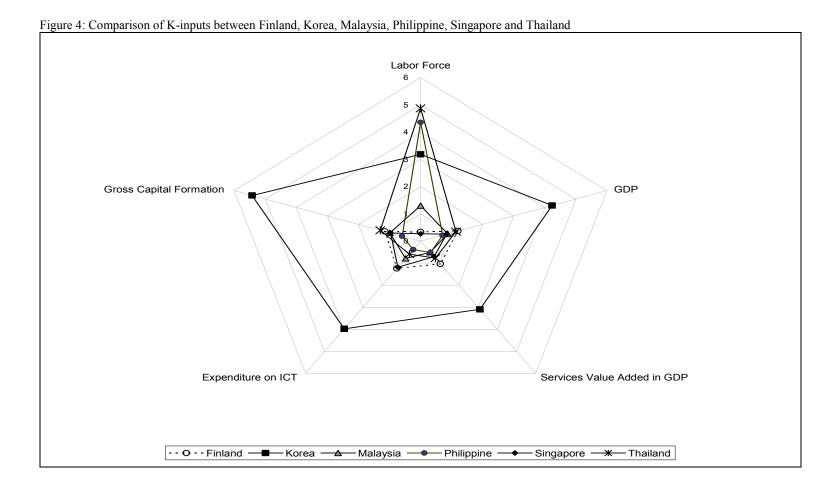
The second set of radar charts portray the k-inputs, which are mostly in absolute monetary values. Figure 3 plots the k-inputs for the large countries while Figure 4 covers all small countries. The division, which is reflected in the scaling of Figure 3 and Figure 4 (all normalized to 100%), clearly show that large countries have devoted larger pool of resources for the development of K-economy. Among the three, the US has the largest pool of k-inputs, follows by Japan. China, although is categorized as one of the large countries, falls far behind the US and Japan in term of k-inputs, except the available large labor force. While among the small countries, Singapore, the smallest in size compared to others, has devoted the most resources to promote K-economy (except in labor force).

As a summary, the radar charts show that developed countries, which achieved a high degree of technology diffusion and creation, have accumulated more knowledge stock. They have also shaped a better resource environment relative to emerging countries like China, Malaysia, Philippine and Thailand. Although China has devoted a large pool of resources especially in ICT expenditure and labor, as a developing country she falls far behind the developed countries in creating knowledge as the country has to deal with problems such as uneven income distribution, with some provinces developing faster than the others. All these could have slowed down the country's efforts in riding towards K-economy. Other emerging countries like Malaysia, Philippine and Thailand lagged behind due mainly to constraint in resources as they are all small economies.

Figure 1: Comparison of K-outputs between the US, Finland, Japan, Korea, and Singapore

Figure 2: Comparison of K-outputs between China, Malaysia, Philippine and Thailand

Figure 3: Comparison of K-inputs between the US, Japan, and China

Figure 4: Comparison of K-inputs between Finland, Korea, Malaysia, Philippine, Singapore and Thailand

Data Envelopment Analysis

Total Relative Efficiency Score

Table 4 reports the total DEA score for relative efficiency of the sample countries. The results show that Finland, Malaysia, Singapore, and Korea achieved a full score of 100%. The US and Japan only achieved 97.07% and 82.03% respectively, while Philippine scored 79.08%. This is followed by Thailand, with a score of 72.42%. China only managed to attain 49.23%, which is the lowest among all. The above results imply that Finland, Korea, Malaysia and Singapore are relatively efficient in using the selected inputs to help in diffusion and creation of the corresponding k-outputs.

An interesting finding is that all the full-score countries are small in size. The result indicates that there is an advantage for small countries in k-resource utilization. They are more efficient in controlling and managing their knowledge resources (k-inputs) compared to the two large economic giants, the US and Japan. The size of these two giants has probably dampened the dissemination of the knowledge parameters and thus lowers the efficiency level in their resources allocation. Although both the US and Japan have promoted a good dissemination of k-outputs (as reported in section 3.1), the DEA scoring implies that the utilization of their resources (k-inputs) are not as efficient as the four small countries. Another possible explanation is that the two developed economic giants are close to their saturation point in knowledge-based growth, resulting in decreasing returns to scale in their resource utilization. This explanation is consistent with the sluggish economic growth undergone by the two economies in the past decade.

The emerging markets of Philippine, Thailand and China are the least efficient among all the countries in term of knowledge diffusion and creation. The Philippines and Thailand scored between 70% and 80% but China scored lower than 50%. A common characteristic of these three emerging markets is that they are all larger in size than the four full-score countries. In addition, they are also less developed in terms of per capita GNI.

Table 4: DEA Total Efficiency Score

Countries	Score (%)
Finland	100.00
Malaysia	100.00
Singapore	100.00
Korea	100.00
US	97.07
Japan	82.03
Philippines	79.08
Thailand	72.42
China	49.23

Generally, the above results point out that small countries with a higher level of economic development (measured by GNI per capita) are more efficient in creating knowledge to promote and build up K-economy. Large developed giants - the US and Japan, suffered a drag in country size and sluggish growth during the sample period, in maximizing the usage of their k-resources to accumulate knowledge stock. Although emerging market like Philippine and Thailand are smaller in terms of country size, they are relatively less efficient because they are less developed than Malaysia and Korea in term of GNI per capita. China ranked the lowest among all, given the fact that China is the largest and the least developed country of them.

Inefficiency and Potential Improvement

In this section, we look at the weak points of the less efficient countries. Table 5 and Table 6 provide the actual data, targets values and the potential improvement (also in %) of k-outputs and k-inputs respectively, for the less efficiency countries, i.e. the US, Japan, Philippine, Thailand and China. This is to propose how a less efficient country should improve in the direction of becoming a relatively efficient unit as compared to the full-score countries.

In terms of k-outputs (Table 5), the *Inefficiency* refers to the total amount (value) or percentage (%) of under-produce k-outputs. In order to become a full-score country, one can improve by increasing the k-outputs as suggested using the current available input resources. In general, the US and Japan are less efficient when come to supplying mobile telephones, as compared to the efficient countries. They also need to promote more number

of PC, international telecommunications and telephone main lines, given the amount of k-inputs they have devoted in. The weakest point of Philippine and Thailand is in the number of PC, followed by high technology export in terms of GDP. Other critical k-outputs that need to be promoted are: international telecommunications, mobile telephones, telephone main lines and scientists and engineers in R&D. For China, the most serious k-output to pick up is the international telecommunications. For other critical outputs, China faces the same problem areas as Philippine and Thailand.

In terms of k-inputs (Table 6), the *Inefficiency* refers to the total amount (value) or percentage (%) of the oversupply k-inputs. In order to become a full-score country, one can improve by cutting down the control k-inputs as suggested but maintaining the current level of k-outputs attained. Given the current k-outputs, the inefficiencies of Philippine and Thailand are clearly due to the big amount of gross-capital formation. This is happen as well to China and to a lesser extent, Japan and the US also. Another inefficiency cause for both Japan and the US is related to high total ICT expenditure.

Table 5: Inefficiencies in K-outputs using the Current Level of K-inputs

K-output	Actual	Ideal	Inefficiency (%)
US			
Number of Internet Host	142823	147129.15	3.02 (0.002%)
Number of PC	625	1547.93	147.67 (23.63%)
International Telecom	156.2	292.69	87.38 (55.94)
Mobile Telephones	389	3519.51	804.76 (206.88%)
Telephone Main Lines	664.5	2878.01	333.11 (50.13%)
Labor Productivity	72517.5	201775.74	178.24 (0.25%)
High Technology Export	206	289.67	40.62 (19.72%)
Scientists & Engineers	4099.4	13992.36	241.33 (0.06%)
Japan			
Number of Internet Host	55930	68180.21	21.9 (0.04%)
Number of PC	348.8	868.58	149.02 (42.72%)
International Telecom	29.3	373.74	1175.57 (40.12%)
Mobile Telephones	526.2	1829.94	247.76 (47.08%)
Telephone Main Lines	585.8	1473.47	151.53 (25.87%)
Labor Productivity	49796.6	106927.3	114.73 (0.23%)
High Technology Export	126	153.6	21.9 (17.38%)
Scientists & Engineers	5095.1	7711.59	51.35 (1.01%)
Philippine			
Number of Internet Host	2000	2528.99	26.45 (1.32%)
Number of PC	21.7	81.61	276.07 (1272%)
International Telecom	44.5	67.62	51.95 (115.93%)
Mobile Telephones	84.4	138.35	63.92 (75.73%)
Telephone Main Lines	40	118.74	196.86 (492.15%)
Labor Productivity	10007	12653.78	26.45 (0.26%)
High Technology Export	9	16.77	86.28 (958.67%)
Scientists & Engineers	157	490.6	212.48 (135.34%)
Thailand			
Number of Internet Host	3536	4882.45	38.08 (1.08%)
Number of PC	27.8	94.72	240.72 (865.90%)
International Telecom	52.6	111.85	112.63 (214.13%)
Mobile Telephones	50.4	160.14	217.75 (432.04%)
Telephone Main Lines	92.3	149.63	62.11 (67.29%)
Labor Productivity	12174.6	16853.09	38.43 (0.32%)
High Technology Export	17	33.05	94.41 (555.35%)
Scientists & Engineers	73.8	120.11	62.75 (85.03%)
China			
Number of Internet Host	33700	68455.02	103.13 (0.31%)
Number of PC	19	1328.03	6889.62 (36261%)
International Telecom	10.7	1568.15	14555.58(136033%)
Mobile Telephones	65.8	2245.32	3312.35 (5033%)
Telephone Main Lines	111.8	2097.88	1776.46 (1588%)
Labor Productivity	6999.3	236290.93	3275.92 (46.80%)
High Technology Export	40	463.39	1058.47 (2646%)
Scientists & Engineers	545.1	1683.99	208.93 (38.33%)

Table 6: Inefficiencies in K-inputs Given the Current Level of K-outputs

K-input	Actual	Ideal	Inefficiency (%)
US			
Gross Capital Formation	2121	693.5	-67.3 (3.17%)
Total ICT Expenditure	812635	194931.03	-76.01 (0.01%)
Japan			
Gross Capital Formation	1045.5	325.51	-68.87 (6.59%)
Total ICT Expenditure	413772	92667.27	-77.6 (0.02%)
Philippine			
Gross Capital Formation	12.57	9.61	-23.5 (186.95%)
Total ICT Expenditure	3131	3131	0
Thailand			
Gross Capital Formation	27.56	15.73	-42.91 (156.70%)
Total ICT Expenditure	4751	4751	0
China			
Gross Capital Formation	454.8	220.57	-51.5 (11.32%)
Total ICT Expenditure	66612	66612	0

CONCLUSION

This paper investigated the knowledge development of nine selected countries; in the two categories of developed and emerging economies, in their transition towards Knowledge-based economy (K-economy). The performances of the selected countries are evaluated by two means, namely, the radar charts and Data Envelopment Analysis (DEA). Taking into consideration most of the important knowledge-based indicators, we employed the radar charting and DEA to gauge the relative achievement and relative efficiency of the sample countries.

The radar charts show that generally, developed countries have accumulated more knowledge stock. They have also shaped a better resource environment in the transition towards K-economy. Emerging countries like China, Malaysia, Philippine and Thailand are lagged behind due possibly to country's size or constraint in resources. In terms of resource utilization, the DEA scoring implies that small countries with higher level of development are relatively more efficient in exploiting their resources (k-inputs) to promote and build up K-economy. Finland, Malaysia, Singapore and South Korea, are relatively more efficient in promoting and developing K-economy when compared to large economic giants like the US and Japan; and also other peers which are less developed. Between the country's size and level of development, the latter has more weight on the achievement towards K-economy. Malaysia has appeared as the most frequent reference peer for others in the DEA analysis. This indicates that Malaysia has done well in resource utilization given the k-inputs attained.

This result has highlight one interesting point showing that although the developed countries accumulated more knowledge stock and devoted more knowledge development resources, it is the small countries that are relatively efficient in utilizing their resources in promoting K-economy, and Malaysia appears to be the best among them. Our study indicates that Asian small countries which attained higher level of development have efficiently tuned themselves towards K-economy. This can be an indication of convergence in term of K-economy, provided there are no more unanticipated big waves such as the 1997 Asian financial crisis, these Asian countries are most likely on track to opt for another possible successful "Asia miracle" in the near future.

REFERENCES

Ali, A.I., Lerme, C.S. and Nakosteen, R. 1993. Assessment of intergovernmental revenue transfers, *Socio-Economic Planning Sciences*, Vol. 27, pp: 109-118.

Ali, A.I. and Nakosteen, R. 2004. Ranking industry performance in the US, *Socio-Economic Planning Sciences*, forthcoming.

Cooper, W.W., Seiford, L. M., Thanassoulis, E. and Zanakis, S.H. 2004. DEA and its uses in different countries, *European Journal of Operational Research*, Vol.154, pp: 337-344.

OECD, 1996. *The Knowledge Based Economy*, OECD, Paris.

Taskin, F. and Zaim, O. 2001. The role of international trade on environmental efficiency: a DEA approach, *Economic Modelling*, Vol.18, pp: 1-17.

Analysis of Meat Consumption Pattern in Peninsular Malaysia: A comparison of Different Demand System Approaches

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ABSTRACT

Meat consumption, retailed prices and per capita income data from the 1960-2002 were employed to estimate the demand for meats in Peninsular Malaysia. The focus was on the Peninsular Malaysia where about two-third of the Malaysia population reside. In order to make a more accurate estimation of meat demand in Peninsular Malaysia, this study focused more on comparison and non-nested model selection criteria, which has been paid little or no attention in the literature. Two most commonly used demand systems, the AIDS and Rotterdam are compared in this study by utilizing peninsular Malaysia per capita consumption of different data. The estimated elasticities imply that as P. Malaysia household income increases, the peninsular Malaysian inhabitants will consume more meats and fish. This potential trend will undoubtedly benefit the fishery and livestock industries as well as feed producers in Malaysia and other countries.

INTRODUCTION

Malaysia, one of the fastest growing countries in the world during the last decade, has attracted the attention of researchers and policy makers. Since the starting fast economic growth, Malaysia has changed significantly in several aspects such as the freedom of consumption choices, the marketing system, and the production technology. These spectacular changes, including a continuously increasing income, volatile prices, a heterogeneous population and family structure, and a growing disparity between urban and rural areas, make the answers to consumption pattern more complex. With economic development, food has become less important in total household expenditures and the types of food purchased have changed significantly. For example, in 1973 households in Malaysia spent almost 34 percent of their monthly expenditure on food, and this had decreased to 22 percent in 1998/99. Percentage of expenditure on food and beverages away from home increased from 8 percent in 1973 to 13 percent in 1998/99.

Demand analysis has two functions. One is to determine the structural determinants of demand; the other is to forecast. Most of the demand analysis has focused on the former function, with little or no attention paid to forecasting, but this study . In order to enhance the credibility of meat demand analysis, the assessment of its structural ability of various demand models becomes profound (Capps, 2002). Hence, this study is motivated by two aspects. On the one hand, several previous findings (Ahmed Zubaidi and Zainalabadin,1993); Ahmed Zubaidi,1993; Nik Mustapha et al. 2000) in estimating meats and food demand in Malaysia using the linear approximate almost ideal demand system (LA/AIDS) showed different elasticities for meats, which many policy makers and forecasters would find unacceptable in predicting the long-term demand for meat in Malaysia. On the other hand, there is no single "one-size-fits-all" functional form that is ideal for all applications (Pollak and Wales, 1992). The selection of functional forms will affect the analysis of specific data, the validity of forecasting, and policy implications. Therefore, this study attempts to select "the best" functional form specification in empirical meat demand research by investigating the predicting performance of the models fitting the meat consumption data in Peninsular Malaysia.

To date, several studies have already estimated meat demand systems in Malaysia employing either time series, or household data (e.g., Ahmed Zubaidi and Zainalabadin,1993; Ahmed Zubaidi,1993; Nik Mustapha et al. 2000; Zainalabadin and Abdullah, 2004). These studies focused on estimation of and explanation on structural parameters for just using one system demand model. Very limited or no attention has been paid to compare among different demand models or model specification. It would be interesting to know how different the performance would be

among these two models. Comparison of different demand systems has been of major interest in applied demand analysis for many countries in recent years. There are a number of studies for US (AC,1993; Buse, 1994; Kasten and Brester,1996, LaFrance,1998; Dameus, et al.2001), Denmark(Yu, et al.,2003), China (Chern and Wang (1994;. Chern (1997); Chern (2000). However, to our knowledge, neither a comparison between the AIDS and QES nor a comparison of the four models has been done.

The objectives of this study are fourfold: (1) to compare the theoretical properties of the selected models; (2) to estimate a demand system for peninsular Malaysia consisting of four meats and fish for 1960-2002; (3) to compare the econometric properties of the selected models, considering both expenditure and price elasticities and (4) to discuss the implication of these models to meat market opportunities.

The remainder of the paper is organized as follows. In section 2, we highlighted the meat consumption pattern of peninsular Malaysia. In section 3, we compare the model specifications and their theoretical properties. In section 4, we present the empirical results of the selected empirical models. Then, we attempt to draw implications from the empirical results for the meat sector. Lastly, a summary and conclusion are provided in section 5.

EVALUATION OF MEAT CONSUMPTION IN PENINSULAR MALAYSIA

Structural changes in dietary habits have been divided into the following stages related to increases in real income: an initial increase in the consumption of traditional staple foods (such as rice); followed by an increase in the consumption of non-traditional staple foods (such as wheat and secondary products derived from traditional staple material); diversification in consumption habits including the time and place of consumption; and finally an increase in the consumption of a greater variety and volume of higher value and higher protein foods including ruminant meat, eggs, milk and milk products in addition to fish (Yuize, 1978; Garnaut and Ma, 1992). In Malaysia, the consumption of livestock products particularly meats has generally increased since early 1970's(Ishida et al.,2003). Table 1 shows peninsular Malaysia's annual total and per capita consumption of beef, mutton, pork and poultry. The trend shows there has been a significant growth of all meat consumption except pork. Increasing trends in the consumption of meats and fish on a per person basis is predominantly the consequence of economic development and associated changes in dietary patterns and taste preference in the country. These trends together with relatively large sizeable population growth rates and expanding urbanization in Malaysia has led to large increases in total demand for meat generally, and especially meat products, in particular. The majority of the observed changes in total meat consumption over time can be explained in terms of population expansion, consumer income growth and price effects (Zainal Abadin and Ahmed Zubaidi, 1993; Nik Mustapha at el, 1999). Although the base levels of consumption are low, the total amount of meat per capita consumed has grown 16.56% since the 1990 to 2001. While the rate of consumption growth has been different for each meat type, poultry and pork have remained the dominant meats consumed (Table 1). The highest growths were beef and mutton, which have increased 60% and 69% from 1990 to 2001. While the consumption of pork per capita declined 16.70 (Table 1).

Table 1: Total and Per Capita Consumption of Meat 1990-2001

Product	1990	1993	1996	1999	2001	Changes (%) 1990-2001
Total Consumption(1000 metric ton)						
All meats	581.6	814.1	886.7	847.7	936.1	14.99
Beef	57.4	70.1	70.1	92.6	112.8	60.91
Mutton	7.6	9.2	14.5	13.6	15.6	69.57
Pork	179.4	195.8	209.0	147.0	163.1	-16.70
Poultry	337.3	539.0	570.1	594.6	644.6	19.59
Per Capita Consumption(kg)						
All meats	32.64	42.38	41.89	37.33	49.4	16.56
Beef	3.22	3.65	4.40	4.08	5.9	61.64
Mutton	0.42	0.48	0.69	0.60	0.7	45.83
Pork	10.07	10.19	9.87	6.47	7.8	-23.45
Poultry	18.93	28.06	26.93	26.18	34.9	24.38

Source: Ministry of Agriculture, Malaysia 2002, own calculations

The relatively high total consumption of poultry and pork can be partly attributed to differences in the relative prices of meats, as pork and poultry are cheaper than beef. These prices influenced by Malaysian's comparative advantage in producing these meats and the existing advanced distribution channels, marketing and processing stages. For example, domestic beef is relatively more expensive in Malaysia due to the ability of distributors to dictate beef prices and high demand during festivals such as Hari Raya and Chinese New Year.

Religion and the ethnic background of the population are also important factors influencing meat consumption. Islam, the main religion in Malaysia, discourages pork consumption, while Indian do not take beef. However, Malaysia's large Chinese population has contributed to a relatively high aggregate pork consumption.

THEORETICAL COMPARISONS OF THE DEMAND SYSTEMS

Since this paper focuses on appraisal of demand models with respect to their forecasting ability, the most popular demand systems in applying meat demand in Peninsular Malaysia, the LA/AIDS, Rotterdam and log-linear, are discussed and compared in this study. Let *wi* denote the budget share of food *i*, *pi* and *g (.)* the corresponding price and quantity demanded, respectively, *X* the total expenditure, and **P** the (n x 1) vector of prices. In addition, let log indicate the natural logarithm operator and all Greek letters denote the parameters to be estimated.

The absolute price version of the Rotterdam model (Theil, 1980) is in short form the Rotterdam model is:

$$\overline{w}_{it} Dq_{it} = a_i + \sum_{i=1}^{N} \gamma_{it} Dp_{it} + \beta_i Q^* + \mu_i \tag{1}$$

Where

$$Q^* = \sum_{i=1}^{N} \overline{w}_i Dq_{it}, Dq_{it} = \log q_{it} - \log q_{it-1}, Dp_{it} = \log p_{it} - \log p_{it-1}, \text{and } \overline{w}_{it} = \frac{1}{2}(w_{it} + w_{it-1}), w_i \text{ is}$$

the observed budget share of the *i*th category in the *t*th period, p_{it} and q_{it} are the price index and the real expenditure for the *i*th good, in *t*th period, respectively.

X is total expenditure on the n goods at time t, α_i, γ_i and β_i are parameters to be estimated, and μ_i is a zero-mean, normally distributed constant variance disturbance. The Rotterdam model has a different dependent variable but especially the same right hand side with AIDS; any differences are in the specification of the income term. The dependent variable is given by $\overline{w}\Delta \ln q_i$, where q_i denotes the quantity consumed of good i and s(bar) denotes the average of $s_{i,t}$ and **s$_{i,t-1}$**. For instance the eq(6) can be write as:

$$\Delta\overline{w}_i \Delta \ln q_i = \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i DQ \tag{2}$$

where

$$DQ = \sum_{t=1}^{n} \Delta\overline{w}_i \Delta \ln q \tag{3}$$

DQ thus plays the role of real income term; it is referred to by Theil and Clements as "finite change version of the Divisia volume index". It is approximately equal to

$$DQ^* = \Delta \ln x - \Delta \ln p * \tag{4}$$

(e.g. Theil 1971 or Theil and Clements) where

$$\Delta \ln P^* = \sum_{j=1}^{n} \Delta\overline{w}_i \Delta \ln p_j \tag{5}$$

The similarity of $\Delta \ln P^*$ to the first difference of Stone's price index in (4.4) is evident. It is the same as the first and largest term of $\Delta \ln P$ except that a moving average of budget shares has been substituted for the current values of budget shares. On the right side it is only in the real income terms that the first differenced LA model can be distinguished from the Rotterdam model. If DQ^* from(9) is used in the rotterdam model, then algebraically the

only remaining differences are those between $\Delta \ln P$ and $\Delta \ln P^*$. The differences involves the use of $\bar{s}$ instead of s_j in $\Delta \ln P^*$ and the deleted Δs_i terms from $\Delta \ln P^*$ in LA model⁻

The Rotterdam model has the following specification (in AC.s paper):

$$\overline{w}_i \Delta \ln q_i = \tau_i + \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i DQ^*$$

$$= \tau_i + \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i \left[\Delta \ln x - \sum_{i=1}^{n} \overline{w}_i \Delta \ln p_j \right]$$

(6)

The above model has satisfied the following restrictions:

Adding-up: $\sum_{i=1}^{N} a_i = 1$, $\sum_{i=1}^{N} \gamma_{ij} = 0$, $\sum_{i=1}^{N} \beta_{ij} = 0$

Homogeneity: $\sum_{i=1}^{N} \gamma_{ij} = 0$

Symmetry: $\gamma_{ij} = \gamma_{ji}$

The basic equation of the linear approximate version of the AIDS is given by

$$w_i = \alpha + \sum_{i=1}^{n} \gamma_{ij} \ln p_i + \beta_i \ln(\frac{x}{P})$$

(7)

Where w_i denotes the budget share of good i, p_j the price of good j and x the total expenditure on the n goods, P is given by Stone's geometric price index:

$$\mathbf{P} = \prod_{j=1}^{n} p_j^{s_j}$$

(8)

Theoretical constraints, imposed in the two models which will be tested with actual data, are the *adding-up*, *homogeneity*, *symmetry* and *negativity* conditions. Budget share thus depends on relative price and on a measure of real income.

However, the AIDS model is often estimated in first difference form in order to reduce the autocorrelation effect. In addition that, economic studies of meat demand often show that consumers do not adjust instantaneously to changes in prices, income and other determinants of demand. When such changes take place, consumer adjustment towards a new equilibrium is spread over several time periods. The main source of these lags is habit persistence (Dhehibi and Gill, 2003). Habit persistence means that consumers make their decisions about current consumption by taking into account consumption in previous periods. In other words, past consumption exerts an important effect on current consumption because some habits have been developed. Therefore several studies, the LA/AIDS model has been estimated in first-differenced form (Deaton and Muelbauer,1980a; Eales and Unnevehr 1991b, and Brester and Wohlgenant; Alston and Chalfant, 1993; Kastens and Brester,1996; LaFrance,1998) to deal this problems. So, to make it consistent with the Rotterdam form, first difference LAIDS is then specified as:

$$\Delta w_i = \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i \Delta \ln(\frac{x}{\mathbf{P}})$$

$$= \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i [\Delta \ln x - \Delta \ln \mathbf{P}]$$

(9)

Where Δ denotes the first-difference operator. The first difference of stone's index in (3) may be decomposed into three components:

$$\Delta \ln P = \sum_{j=1}^{n} w_j . \Delta \ln p_j + \sum_{j=1}^{n} \Delta w_j . \ln p_j - \sum_{j=1}^{n} \Delta w_j . \Delta \ln p_j \qquad (10)$$

as Alston and Chalfant(1993) showed the third term is normally small while the second part is also likely to be quite little and do not change much from one observation to next in the time-series data shares. Substituting the first term of *Δlnp* from (4.4) into the first-differenced LAIDS model in (4.5) yields:

$$\Delta w_t \approx \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i \left[\Delta \ln x - \sum_{j=1}^{n} w_i \Delta \ln p_j \right] \qquad (11)$$

These two version of the first-differenced LAIDS model equations(4.3) and (4.5) differ only in approximations to the price index to produce approximately same estimates. Equation (4.5) in particular, is quite similar to the Rotterdam model, a point first mode by Deaton and Muelbaurer (1980a).

For the AIDS model, AC used four alternative specifications of the first-difference model with seasonal dummy variables. For the purpose of this study, only the standard specifications that AC call Rotterdam II and AIDS VI are considered. The first-difference linearized version of the AIDS model without quarterly seasonal dummies variables (using the Stone index) presented as AC.s model VI is:

$$\Delta w_i = \tau_i + \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i DQ^*$$

$$= \tau_i + \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i \left[\Delta \ln x - \Delta \ln P \right] \qquad (12)$$

The final Rotterdam and FAIDS models in share equations are given by

$$\overline{w}_i \Delta \ln q_i = \tau_i + \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i \left[\Delta \ln x - \sum_{i=1}^{n} \overline{w}_i \Delta \ln p_j \right] \qquad (13)$$

$$\Delta w_i = \tau_i + \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + \beta_i \left[\Delta \ln x - \Delta \ln \mathbf{P} \right] \qquad (14)$$

The above approximation leads to both models having a common right-hand side, and thus, the linear combination is only applied with the left-hand side variables. To select the appropriate model for estimating the demand of meat we used the non-nested test which was developed by AC (1993) and LaFrance (1998). Therefore the encompassing tests to select between the AIDS and the Rotterdam models for peninsular Malaysia meat demand are:

$$(1-\lambda)\overline{w}_i \Delta \ln q_i + \lambda \Delta w_i = \tau_i + \sum_{j=1}^{n} \gamma_{ij} \Delta \ln p_j + (1-\lambda)\beta_{i0} \left[\Delta \ln x - \sum_{i=1}^{n} \overline{w}_i \Delta \ln p_j \right]$$

$$+ \lambda \beta_{i1} \left[\Delta \ln x - \sum_{i=1}^{n} \Delta w_i \ln p_i \right] \qquad (15)$$

In this compound model, testing $\lambda = 0$ is equivalent to testing that the Rotterdam model is the true model. Equation (9) compounds AC's FDAIDS with their approximate Rotterdam; again, this allows combining only the left-hand side of both models. Testing $\lambda = 1$ corresponds to testing that FDAIDS is the true model. The parameters in this equation can be determined by maximum likelihood estimation and likelihood ratio test can be used to discriminate between the two competing models.

THE DATA

The meat demand models was estimated using yearly data of Peninsular Malaysia from 1960 to 2002 and it comes from a number of sources. The consumption data is per capita consumption of beef, mutton, pork, chicken and fish consumed in peninsular Malaysian and theirs retailed prices came from various issues of Annual Statistical Yearbooks published by the Department of Veterinary service and FAMA. All prices where deflated by the Malaysian consumer price index(1995=100) which came from various issues of Annual Statistical Yearbooks published by the Department of Statistics.

The number of observations in the sample is 43, typical of data series available to researchers for the estimation of demand systems. All expenditures used are on a real per capita basis, and total expenditure is the sum of the real per capita expenditures on these four meats and fish. From now on all variable are expressed as natural logarithms.

EMPIRICAL RESULTS

Two complete demand systems, the LA/AIDS and Rotterdam are estimated using the iterative seemingly unrelated regression (ITSUR) estimator with four meat types and fish. In the empirical analysis, meat is treated as a weakly separable group comprised of beef, mutton, pork, and chicken in which consumption of an individual meat item depends only on the expenditure of the group, the prices of the goods within the group, and certain introduced demand shifters. Models were estimated using iterated non-linear estimation techniques. Due to the singular nature of the share system one of the equations must be deleted (fish) with the remaining equations being estimated. Theoretical restrictions such as homogeneity and symmetry were imposed as a maintained hypothesis.

The results of joint non-nested tests designed to test only the functional form of these two systems for using the likelihood ratio test developed by LaFrance is presented in table 2. Results indicated that both the Rotterdam and FDAIDS model can be rejected. First we conducted the test where the null hypothesis is that the Rotterdam demand model is preferred model (AIDS set to 0) for estimating the demand of meat in peninsular Malaysia and result shows that we can rejected the null hypothesis at 5% significant level. In addition, the estimate of λ is close to one which confirmed the alternative hypothesis.

We repeated the same test where the null hypothesis is that the AIDS model is preferred model(Rotterdam set to 0)this time. Also the results rejected the AIDS model and accepted the Rotterdam. Thus, the finding indicated that AIDS and Rotterdam are equivalent for peninsular Malaysia. Therefore no conclusion can be drawn from the tests regarding the relative explanatory power of AIDS and Rotterdam (wang, et al.1996) This is different the findings of LaFrance(1998) and Dameus et al (2001) when they tested two model for using U.S data, but the data they applied were quarterly data, while our data is yearly. The estimation process fails to converge for some starting values and when it does converge, it produces a 'maximized' log likelihood value for the compound model that is lower than that for the Rotterdam. This difficulty in obtaining convergence is another drawback of the compound model test of non-nested method.

Table 2: Likelihood Ratio Test to Select between FDAIDS and Rotterdam for U. S. Meat Demand, as Proposed by LaFrance

Model	λ-estimates	Log likelihood	P-value	Conclusion
ROTTERDAM vs FAIDS				
Compound Model	0.975514	868.91		
FDAIDS (set to 0)		845.81	0.032*	reject
Rotterdam (set to 1)		865.49	0.652	Fail to reject
FAIDS vs ROTTERDAM				
Compound Model	1.00901	851.32		
Rotterdam (set to 0)		839.03	0.009*	reject
FDAIDS (set to 1)		850.10	0.891	Fail to reject

Based on χ^2 distribution at significant level of 5%

Estimates of the AIDS and Rotterdam parameters are not reported here but estimated coefficients, for which we have *a priori* expectations about sign, comply well with these expectations and are predominately statistically significantly different from zero in both models.

The estimates of meat demand elasticities (at sample mean) in peninsular Malaysia are summarized in tables 3. Expenditure elasticities measure the change in the demand for the four different meat products as the allocation of the household expenditures among these meat products change. As one can see in table 3, the expenditure elasticities are not very different between the selected models ranging from 0.70 to 1.694. The highest expenditure elasticity corresponds to mutton demand from the LA/AIDS. In addition, the AIDS and Rotterdam have almost similar expenditure elasticities although the Rotterdam model has more elastic expenditure for beef and fish. For example, the elasticity for fish from the LA/AIDS is 0.807, indicating fish as a normal goods, whereas that from the Rotterdam model 1.033 showing a highly elastic demand.

Net of expenditure effects, pork is more sensitive to own price changes in comparison to any of the other three meat products. Using the cross price elasticities, there is little substitutability between fish and the other three meat products, while beef shows the highest degrees of substitutability with the other products

Table 3: Expenditure and Price elasticity estimate of beef, mutton, pork, chicken and fish in both models

	Beef	Mutton	Pork	Chicken	Fish	Expenditure
Rotterdam						
Beef	**-0.463**	0.127	-0.045	-0.053	-0.157	1.099
Mutton	0.229	**0.341**	0.039	0.044	0.159	1.284
Pork	-0.025	0.001	**-0.623**	-0.594	-0.297	0.925
Chicken	0.249	0.015	-0.116	**-0.959**	-0.050	0.881
Fish	-0.117	-0.043	-0.268	-0.347	**-0.872**	1.033
AIDS Model						
Beef	**-0.915**	0.613	0.117	0.147	0.519	0.975
Mutton	0.1457	**-0.971**	0.242	0.304	1.000	1.698
Pork	-0.041	-0.004	**-1.035**	-0.043	-0.719	1.242
Chicken	0.254	0.016	0.056	**-0.929**	-0.378	0.707
Fish	-0.124	-0.032	-0.434	0.473	**-0.940**	0.885

In table 3, the uncompensated own-price elasticities show more similarity among the two models and own-price elasticities for all meat items are found to be negative, thus the corresponding demand curves are downward sloping. The range of the own-price elasticities are from -1.031 (for Chicken from the AIDS) to -0.0722 (for fish from the Rotterdam). Almost all the meats show a high price inelastic demand except for pork from the LA/AIDS. Moreover, the own-price elasticities from LA/AIDS are higher than Rotterdam model. This finding implies that the price policies for meats are not too sensitive for consumer at least in short term period. Hence, the empirical results obtained in this study suggest that price elasticities are more alike among model specifications as compared with expenditure elasticities and the uncompensated own-price elasticities.

This finding is consistent with several previous studies based upon time-series and cross-sectional data. For instance, Ahmad Zubaidi (1993), Ishida (1994) and Ishida et. al. (2003) discovered that meat, in particular poultry meat whose per capita consumption tends to increase drastically over time, has very high demand elasticity with respect to income. Ishida et. al. (2003) have mentioned that with rapid economic expansion and impressive growth of the food industry especially the fast food sector, spending on food away from home has increased drastically since the 1980s, implying that meat consumption away from home has also increased to some extent. On balance, it is expected that the importance of meat in Malaysian dietary consumption will increase steadily with economic development.

As to different meats, the expenditure elasticities from the study show most meats specially beef and mutton are elastic. This implies that as Malaysia continues its economic growth, peninsular Malaysian urban inhabitants would increase their household income and spend more on those high-protein products. This would stimulate livestock

industries in Malaysia as well as other trade partner countries. However, the highly elastic own-price elasticities of some meats would imply those consumers are highly sensitive to price changes. Hence, the pricing policy for agricultural suppliers and traders will play a key role in making profits from this market in hugely populate areas in Peninsular Malaysia.

CONCLUDING REMARKS

Malaysia, with a fast growing economy has attracted the attention of agricultural traders and research analysts. In order to make a more accurate long-run prediction of meat demand in Peninsular Malaysia, this study focused more on non-nested as a critical criterion of model selection, which has been paid little or no attention in the literature. Two most commonly used demand systems, the LA/AIDS and Rotterdam are compared in this study by utilizing peninsular Malaysia per capita consumption data

The estimated elasticities imply that as urban peninsular household income increases, the Malaysia urban inhabitants will consume more meats and fish. This potential trend will undoubtedly benefit the fishery and livestock industries as well as feed grain producers in Malaysia and other countries. However, suppliers and traders need to be cautious when instituting a price policy in order to maintain profitability.

REFERENCES

Ahmed Zubaidi Baharushah and Zainal abadin Mohamed.1993. Demand for meat in Malaysia: an application of the Ideal demand System analysis. *Pertanika J.Soc.Sci.& Hum*.1(1);91-99

Ahmed Zubaidi Baharushah.1993. Applying the almost ideal demand Systems to meat expenditure Data: Estimation and Specification Issues. *The Malaysian Journal of Agricultural economics* 10;23-37

Alston, J.M. and Chalfant, J.A. 1991. Can we Take the Com Out of Meat Demand Studies? *Western Journal of Agricultural Economics,* Vol. 16(1): 36 – 48.

Alston, J.M., Foster, T.K., and Green, R.D. 1994. Estimating Elasticities with the Linear Approximate Almost Ideal Demand System: Some Monte Carlo Results. *The Review of Economics and Statistics,* Vol. 76(2): 351 – 356.

Asche, F. and Wessels, C.R. 1997. On Price Indices in the Almost Ideal Demand System. *American Journal of Agricultural Economics*, Vol. 79: 1182 – 1185.

Bansback, B. 1995. Towards A Broader Understanding of Meat Demand. *Journal of Agricultural Economics*, Vol. 46: 287 – 308.

Ben Kaabia, M. and Gil, J.M.2001. Estimation and Inference in Cointegrated Demand Systems: an application to Tunisian meat Consumption. *European Review of Agricultural Economics*,28;349-70.

Buse, Adolf, 1994. Evaluating the Linearized Almost Ideal Demand System. *American Journal of Agricultural Economics*, Vol. 76, November 1994, 781-793.

Capps, O. Jr.,2002.New Directions in Empirical Food Demand Research. *Presentation at the 2002 AAEA Meetings*, Long Beach, CA, July 28-31.

Chalfant, J. 1987. A Globally Flexible, Almost Ideal Demand system," *Journal of Business and Economic Statistics*, Vol. 5, 233-242.

Chern, W.S., and G. Wang, 1994. The Engel function and Complete Food Demand system for Chinese Urban Households," *China Economic Review*, Vol.4, spring, 35-57.

Deaton, A. and J. Muellbauer, 1980. An Almost Ideal Demand System. *American Economic Review*, Vol. 70, 312-326.

DVS ,1999. Department of Veterinary Services, Ministry Of Agriculture, Malaysia.

Eales, J.S. and Unnevehr, L.J. 1988. Demand for Beef and Chicken Products: Seperability And Structural Change. *American Journal of Agricultural Economics,* Vol. 70: 521 - 532.

Fan, J.X. and W.S. Chern,1997.Analysis of Food Consumption Patterns in China: Nonparametric and Parametric Approaches," *Journal of Family and Economic Issues*, Vol. 18, 113-125.

Fraser, I. and Moosa, I.A. 2002. Demand Estimation in the Presence of Stochastic Trend and Seasonality: The Case of Meat Demand in the United Kingdom. *American Journal of Agricultural Economics,* Vol. 84(1): 83 - 89.

Green, R. and J.M. Alston,1990.Elasticities in AIDS Models. *American Journal of Agricultural Economics*, Vol. 72, May, 442-445.

Hahn, W., 1994. Elasticities in AIDS Models: Comments. American Journal of Agricultural Economics, Vol. 76, November, 972-977.

Hasan, M., R. Fahs, R.C. Mittelhammer, and T. Wahl, 2001. Estimation of Systems of Censored Limited Dependent Variables Models Using Simulated ML and GMM Estimation Methods. AAEA annual meeting,

Hayeng,M, and D. Hacklander, 1990. Monthly supply-demand relationships for Fed Cattle and Hogs. *American Journal of Agricultural Economics*, 52;169-210.

Johnson, S.R., Hassan, Z.A. and Green, R.D. 1984. *Demand Systems Estimation, Methods and Applications*. Ames: The Iowa State University Press.

Ishida A., Law S. and Aita,Y. 2003. Changes in Food Consumption Expenditure in Malaysia. Agribusiness, Vol. 19 (1), 61–76.

Kastens, Terry L.1996. Model Selection and Forecasting Ability of Theory-Constrained Food Demand System. *American journal of agricultural economics*, vol.78;301-312.

Lewis, P. and N Andrews, 1989. Household Demand in China. *Applied Economics*, Vol.21, 793-807.

Liu, K. E. and W. S. Chern, 2001b. Estimation of Food Demand Systems: Evidence from Micro Household Data in Urban China. Agricultural and Resource Economics Review, Selected Abstracts of the NAREA Meeting, Vol. 30, October, 2001b: 216217.

Mohm Fauzi Mohd Jani and Ibrahim Yunus.1993. An econometric Analysis of the Beef market in Peninsular Malaysia. *Malaysian Agricultural commodity forecasting and policy modeling* edited by fatimah mohd arshad, Mad Nasir shamsuding, and mohd shahwahid, 1993, center of agricultural policy studies, Univesiti Pertainian Malaysia.

Moschini, G. 1995. Units of Measurement and the Stone Index In Demand System Estimation. *American Journal of Agricultural Economics,* Vol. 77: 63 - 68.

Park, Richard W., 1969. Systems of Demand Equations: An Empirical Comparison of Alternative Functional Forms. *Econometrica*, Vol. 37, 629-650.

Pollak, R. A. and T. J. Wales 1992. Demand System Specification and Estimation, Oxford University Press, Chapter 2, pp.22-23,.

Purcell, W.D. 1989. The Case of Beef Demand: A Failure by The Discipline. *Choices,* Vol. 2: 16 – 19.

Wu, Y., E. Li, and S. N. Samuel, 1995. Food Consumption in Urban China: An Empirical Analysis. *Applied Economics*, Vol.27, 509-515.

Yu, Wusheng, Hurtel, T.W, Precket, P.V. and Eales,J.S.2003. Projecting World Food Demand Using Alternative Demand Systems. *Economic modeling* 21,99-129.

Zainalabadin Mohamed and Abdullahi F. Ahmed, 2004. Alternative Estimation of Meat Supply and Demand in Peninsular Malaysia's Beef Sector: An Application of Cointegration and Error Correction Model Techniques. A Paper presented at the Agriculture Congress: Innovation Towards Modernized Agriculture held at MIECC, Kuala Lumpur, Malaysia, 4-7 Okterber, 2004.

ASEAN-India Economic Relations: Areas of Complementarities

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ABSTRACT

This paper examines areas of complementarities between ASEAN and India economic relations and hence prospect of mutual collaborations. The motivation for collaboration is to exploit the synergies and complementarities between ASEAN countries and India in a mutually beneficial manner in factor endowments, economic structure and skills and capabilities in diverse areas, including trade and investment, infrastructure development, science and technology and tourism. The existing economic relations in the areas of merchandise and service trade, investment, tourism services, manpower flows are discussed. Areas of complementarities and competition are identified between India and selected ASEAN countries; i.e., Indonesia, Cambodia, Philippines, Thailand, Singapore and Vietnam. The analysis suggests that the two regions complement each other more than they compete. However the operationalisation of the collaborations requires more than just economic debate.

INTRODUCTION

After decades of inward-looking policy, beginning in the 1990s, India began to seek greater integration with the world economy at large and the Asian and ASEAN (Association of Southeast Asian Nations)[2] economies in particular. India has embarked on a number of market driven restructuring programmes; which include the "Look East Policy" aiming at greater integration with the Asian economy . This has led the Indian economy to grow at an annual growth rate of 5.9% during the 1992 – 93 to 2002 -03 period (Goswami, 2003). Some of the indicators of the external sector are reflected in positive balance of payments surplus, low external debt to GDP ratio, moderate foreign exchange reserves, emergence of Indian exporters and rising involvement of Indian companies in the international economy. India is well on its way to becoming a trillion dollar economy (Morgan Stanley, 2003; Wilson and Puroshothaman, 2003). A number of collaborative initiatives have been launched between India and ASEAN neighbours aiming at greater collaborations in political, social and economic ties. Many regional projects have been set up in the areas of science and technology, trade and investment, infrastructure development and tourism. This paper examines firstly; the areas of complementarities and mutual economic collaborations between ASEAN and India; and secondly; the prospect of mutual collaborations. The paper is organized as follows. The following section discusses the status of ASEAN-India relations. This is followed by a discussion on the existing economic relations. The areas of complementarities and potential economic collaborations are discussed next. The last two sections provide discussion on the prospects of such collaborations and conclusions.

STATUS OF ASEAN - INDIA RELATIONS

Since the initiation of India's Look East Policy in the1990s, bilateral relations between India and ASEAN (Association of South East Asian Nations) have progressed rapidly. The scope and intensity of relations between India and the ten member ASEAN has been steadily rising. India became a sectoral dialogue partner of ASEAN in 1992; full dialogue partner in 1995, and a member of the ASEAN Regional Forum dealing with security issues since July 1996.The first ever ASEAN-India summit hosted by Cambodia in November 2002 represented another important milestone in bilateral relations. The move was driven by the following factors. Firstly, Indian leaders have indicated a strong motivation to work closely with ASEAN members. Secondly; ASEAN leaders have recognized the need to integrate India with ASEAN economies and affairs so as to develop a more balanced relationship with all major Asian economies. Thirdly, there is a common belief among ASEAN members that there exist a complementarity between Indian economy (which is service oriented) and ASEAN economies (light manufacturing) with significant mutual gain (Sen et al., 2004). Hence, the objective of the India-ASEAN partnership is to exploit the synergies and complementarities between India and ASEAN countries in a mutually beneficial manner in factor endowments, economic structure and skills and capabilities

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[1] The author thanks Ernawati for her assistance.
[2] ASEAN comprises ten countries that are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

in diverse areas, including trade and investment, infrastructure development, science and technology and tourism (Nathan, 2000).

A number of collaborative initiatives have been launched and many regional projects have been set up in the areas of science and technology, trade and investment, infrastructure development and tourism (Sen et al., 2004). India and ASEAN are also working on a framework agreement on trade and investment. A framework agreement for the creation of a free trade area (FTA) with Thailand was signed in October 2003. Under this agreement, 84 items can be imported from Thailand from April 2004 at 50% of the normal rate of duty prevailing in India. India has also participated in other negotiations such as to form a Comprehensive Economic Cooperation Agreement (CECA) with Singapore, sub-regional cooperation between India and some of the ASEAN members such as Vietnam, Thailand, Myanmar, and Laos. Some of the sub-regional cooperations include the Mekong-Ganga Cooperation (MGC) and the BIMST-EC (Bangladesh, India, Myanmar, Sri Lanka, Thailand Economic Cooperation). India is also an active participant in Asian Cooperation Dialogue (ACD) which has representation from all parts of Asia. A Framework Agreement on establishing a Free Trade Area (FTA) between ASEAN and India was signed during the Second ASEAN-India Summit in Bali in October 2003. The aim of this framework is increase bilateral merchandise trade between ASEAN and India to USD15 bn by 2005 and USD30 bn by 2007.

The FTA provides for an early harvest programme that specifies the areas for collaboration and a common list of items for preferential tariff concessions. According to this Framework Agreement, the deadline for negotiations for an ASEAN-India FTA in goods would be between January 2004 and June 2005, and for services and investments between 2005 and 2007. A trade negotiating committee (TNC) has been established that will begin framing of the rules of origin (ROOs), the modalities for tariff reduction and the FTA in January 2004. Both have agreed to initiate tariff reductions under the FTA by January 1, 2006. It is envisaged that formal tariffs on non-agricultural goods will essentially be eliminated for all ASEAN countries, except for the Philippines, by 2011, with the CLMV countries (i.e. Cambodia, Laos, Myanmar and Vietnam) reciprocally eliminating tariffs for India with effect from 2016. India has also agreed to extend unilateral tariff concessions to the CLMV countries on 111 items to extend special and differential treatment to the newer ASEAN members, based on their levels of development. India and Philippines have agreed to eliminate tariffs on a reciprocal basis by 2016. In 2000, India's average tariff rate was about 29% compared to an average of 10-12% for ASEAN. In January 2004, India announced wide ranging reduction in tariffs to about 20%. Besides, custom procedures have also been simplified to reduce cross-border transaction costs (Business Standard, 2004)

EXISTING ECONOMIC RELATIONS

Existing economic relations between India and ASEAN involve activities such as merchandise and service trade, investments, tourism and manpower flows. The nature of economic relations between India and ASEAN is determined by the demographic and economic characteristics of each country. The following paragraphs discuss the salient demographic and economic characteristics between the two areas as presented in Table 1.[3]

(i)   As of 2002, India is the most populous country with more than one bn people which is more than twice that of ASEAN. The most populous country in ASEAN, Indonesia, has about one-fifth of India's population. In terms of density of population per square kilometer, the same pattern is observed; i.e., India with 314 person per square kilometer and Indonesia with 211.

(ii)   In terms of population composition, India has the highest percentage of young population, i.e., in 2003, 52% of the nation is under 25 years old. Almost a third of India's population are below 14 years compared to 17.3% in Singapore and 24.2% in Thailand.

(iii)   The level of urbanization is the highest in Singapore (100%). More than half of the population in Philippines and Malaysia live in the urban areas. Other countries like Thailand, Cambodia, Myanmar and Vietnam, a larger proportion of the population live in the rural areas.

(iv)   Agriculture labor accounted for more than two-thirds of the labour force in Cambodia, Myanmar and Vietnam. This is because of the predominance of agriculture in the countries' economy. The share of agricultural labour in India and Thailand is 59.2% and 55.7% respectively. Singapore is an industrial

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[3] Because of data limitation, only six ASEAN countries are included in Table 1. Brunei and Laos are excluded because of lack of comparable data.

economy where only 0.1% of the labor force is involved in agriculture. In Malaysia, about 17.9% of the labour force worked in the agriculture sector.

(v)   In terms of output structure (% of GDP), most of ASEAN countries are moving toward industrial product and services with the notable exceptions of Cambodia, Vietnam and Myanmar. In Thailand and Malaysia, agricultural output only accounts for about 9% of their GDP and almost half of their output are services. About two-thirds of Singapore's output are services.

(vi)   ASEAN's per capita income in 2002 of USD 3,587 was about seven and a half times that of India at current exchange rates, and 2.4 times that of India in PPP terms.

(vii)   In absolute terms, ASEAN's GNI in 2002 of USD 546.4 bn at current exchange rates was nearly one-tenth higher than that of India. However, in PPP terms, India's GNI of USD 2778 bn exceeded ASEAN's by more than a third.

(viii) ASEAN countries are far more integrated with the world economy than India. This is indicated by its much higher trade to GDP ratio and greater dependence on external sources of capital, technology, external borrowings and manpower. The ratio of trade to GDP for India was 30.8% in 2002 compared to Singapore (318.7%) and Malaysia (210.7%). Even the poorer countries in ASEAN are integrating their economy through trade. For instance the ratios of trade to GDP for Vietnam and Cambodia were 115% and 126.6% respectively. ASEAN's greater integration with the world economy is also indicated by its FDI inflow in 2002 of USD 12.4 bn as compared to only USD 3 bn for India; and by external debt of USD 40.3 bn (7.4 % of GNI) as compared to USD104.4 bn (21.1% of GNI) for India.

(ix)   The Human Development Index[4] in ASEAN region in 2002 varied from the highest i.e., 25 (Singapore) and the lowest i.e., 132 (Myanmar). The HDI for India was 127 (Figure 1).

(x)   The Global Competitiveness Rank placed India as the 56th country in terms of competitiveness compared to Singapore (6th), Malaysia (26th) and Thailand (29th). Other poor countries in ASEAN ranked lower such as Indonesia (72nd), Philippines (66th) and Vietnam (60th) (Figure 2).

The above observations indicate that the ASEAN countries are highly heterogeneous in terms of demographic and economic profile. Living under different political systems, ASEAN countries are at different stages of socio-economic development. In term of economic status, Singapore is considered a fully developed economy while Malaysia and Thailand are slowly moving toward industrialized nations status. Indonesia is still grappling with recovery from the crisis while war torn countries such as Vietnam and Cambodia are beginning to show some signs of sustainable growth.

MERCHANDISE TRADE

The total export and import of India to and from the world and ASEAN region are presented in Tables 2 and 3[5]. The tables provide the following observations:

(i)   India's export to the world has increased from USD180 mn in 1991-2 to USD437 mn in 2001-2 suggesting an annual growth of 13%. The value of export to ASEAN countries increased from USD1022 mn to USD 2851mn in 1996-97 before declining sharply to USD 1589.2 in 1998-89 a result of the Asian crisis. There has been a recovery since then.

(ii)   The share of India's export to ASEAN countries is still small i.e., accounting for about 5.7% in 1992-2 and reached its peak at 8.5% in 1995-96, i.e., before the onset of crisis in 1997. The share reduced to the lowest figure of 4.8% in 1999-00 and it has increased albeit slowly ever since reaching 7.7% in 2001-2002 (Figure 3). India's total value of exports to ASEAN, however, exceeded its export to Japan and Germany.

(iii)   There was a considerable shift in the share of total Indian exports to ASEAN among the individual members during the 1990s. In general, the share of India's exports to Indonesia (particularly until the 1997 crisis) and Vietnam have increased significantly, while the share to Singapore has declined. In

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[4] The HDI is a summary measure of human development. It measures the average achievements in a country in three basic dimensions of human development: (i) * A long and healthy life, as measured by life expectancy at birth; (ii) Knowledge, as measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary and tertiary gross enrolment ratio (with one-third weight); and (iii) A decent standard of living, as measured by GDP per capita (PPP US$).
[5] Data is sourced from Centre for Monitoring Indian Economy (CMIE). The data are aggregate data for April-September which represent the fiscal rather than calendar year.

absolute terms, however, Singapore remains the largest market in ASEAN for India's goods, followed by Malaysia, Thailand, Indonesia, Vietnam, and the Philippines (Figure 4).

(iv)   India's imports from ASEAN have increased nearly four times, from USD1.9 bn in 1992 to USD5.1 bn in 2001-02 (Table 3 and Figure 5). In 2001-02, ASEAN accounted for 7.8% of India's imports from the world. During the 1990s, the relative importance of ASEAN countries in India's imports has changed considerably. In 1991- 92, Singapore's share was 54.6 percent, but by 2001-02, this has reduced to 30.5%. The share of Indonesia, however, has increased from 5.3% to 26% during the said period; and Vietnam from 3% to 8.0%. Malaysia's share increased from 5.3% in 1991-92 to a high of 41.2% in 1999-2000 but began to decline to 28.5% in 2001-02. In value terms, Singapore is still the highest but in relative terms, its importance has been declining. India's exports to Malaysia, Indonesia and Vietnam have generally shown an increasing trend (Figure 6).

(v)   As India's imports from ASEAN have grown much faster than its exportss, the balance of trade has shifted sharply in favor of ASEAN (Table 4). India experienced surpluses only in 1992-3. India's trade deficit with ASEAN increased quite sharply after the 1997 crisis, reaching USD 2.7 bn in 1999-2000, more than a quarter of its total deficit with the world (Table 4). In 1999-2000, India had the highest bilateral deficit with Malaysia (USD1.6 bn), followed by Singapore (USD 0.8 bn), and Indonesia (USD 0.7 bn). If one considers trade in services, such as tourism, logistics and transportation services, India's trade deficit with ASEAN will be much larger. These data indicate the significance of ASEAN as India's trade partner while India still does not figure prominently as a trade partner for ASEAN.

(vi)   The composition of ASEAN export to India between 1993 – 2000 is depicted in Table 5. As shown in the table, ASEAN's export composition to India has changed between the said period. In terms of product section, in 1993 a total of 22.3% of ASEAN's export to India were base metal and metal articles, mineral products (20.8%), machinery and electrical appliances (19.8%). However, by 2001 machinery and electrical appliances accounted for almost 30.3% followed by mineral products (14.6%) and fats and oils (13.7%). In terms of rate of growth, the exports of fats and oils (in particular palm oil) has registered the highest rate i.e., 12.9% between the stated period. This is followed by wood products (11.4%) and vegetables products (10.2%). The other products that indicated impressive growth include hides and leather, pulp and paper, textiles and apparel, optical and precision instruments.

(vii)   ASEAN's import from India is depicted in Table 6. The composition of ASEAN imports from India has also changed between 1993 and 2001. In terms of product section, in 1993 the major import items were; prepared foodstuffs (16.2%), base metal (15.2%), machinery and electrical appliances (14.8%) and textile and apparels (12.1%). However by 2001, the major items imported by ASEAN countries from India were machinery and electrical appliances which accounted for 27.7%. This is followed by chemicals (13.3%), base metal and metal articles (9.9%) and gems (9.3%). In 2001, India's import from ASEAN countries mainly consist of artificial resins, plastic material, natural rubber, wood and wood products, electronic goods, non-ferrous metals, metaliferrous ores and metal scrap, organic chemicals, edible oils, coal, fertilizers, etc.

(viii)   The balance of trade for each of the product category is in favor of ASEAN for most of the products with notable exceptions for prepared foodstuffs, live animals, gems, base metals and textiles and apparels (Table 7). In fact the negative balance of trade of these products have widened since 1993. For instance the deficits for live animals imports have increased from USD43mn to USD 217mn between 1993 and 2001. The deficits for prepared food stuffs, gems, and hides and leather products showed a similar trend. However the deficits for textiles and apparels have somewhat narrowed from USD141mn to USD14mn. The balance of trade for base metals was positive in 1993 at USD113mn but it became negative in 20 01 at USD73 mn. ASEAN enjoyed significant positive balance of trade for items such as fats and oils (in particular palm oil), machinery and electrical appliances, mineral products, wood products and others.

SERVICE TRADE

Although data on the India-ASEAN service trade is unavailable, India fared very well in this area. India's share in Asia's exports of commercial services (as defined by WTO) increased from 3.5% to 7.3% between 1990 and 2002 (Sen et al., 2004). India's share in world trade of commercial services in 2002 was higher than Malaysia, Indonesia and the Philippines, and almost about half of Singapore (WTO, 2003). The ICT services sector accounted for about 70% of service exports, equivalent to 16% of India's total merchandise exports in the year 2000. The ICT and related services have constituted the major driving force behind services trade in India. The Indian software industry has been progressing remarkably in recent past (Mehta, 2003). The revenue of the

industry has been growing at the rate of more than 50% during the last seven years, touching a level of USD57bn in 1999-2000. A major share of the total revenue originates from export market.

The ICT industry in India comprises hardware and software production. The software sector is diversifying into Application Service Provider (ASP), e-commerce and applications to support business process operations (BPO). India has progressed in development of cost effective software solutions for various corporate applications. The exports of Indian IT software are being carried out either at clients site abroad (on-site) or at vendor's site in India (off-shore).Almost 50% of India's export originate from "off-shore." Besides, a large number of MNCs have established bases in India. Although the share of these MNCs in the Indian software industry is small (21.4%). They have higher degree of export orientation (94%). India has become the leading destination for outsourcing of ICT services, call centre support and other back-end BPOs. Outsourcing to India in particular has not only involved low-to-mid skill areas like call centres and routine data-crunching tasks, but also more sophisticated and skills-based services including software development, research and development (R&D), financial portfolio analysis, patent writing and product design and development.

INVESTMENT

The investment of ASEAN-6 countries in India between 1996 – 2001 is presented in Table 8 and Figure 7. As shown in the table, the share of ASEAN investment in India is still small, i.e., it accounted for only 1.7% of the total FDIs in India in 2001. The share of ASEAN's FDIs in India reached its peak in 1998 at 8.1% and began to decline in 1999 and it has increased a little to 1.7% in 2001. In terms of value, the total FDI from ASEAN has reduced from USD214.5 mn in 1996 to USD103.6 mn in 2001; indicating a reduction of almost half. Among the ASEAN countries, Singapore is the major investor accounting for 77.7% of ASEAN's investment. Malaysia was the largest ASEAN investor in 1997 (before the crisis) accounting for 70% of the ASEAN investment in India. However, after the crisis its share has reduced to 21.6% by 2001. The FDI from Singapore accounted for about 42.1% in 1996 and has increased significantly to 86.9% in 1999 and began to decline slowly to 77.7% in 2001. The investment from the other ASEAN countries were also declining within the said period (Figure 8).

Among the ASEAN countries, only Singapore is a net lender abroad. Singapore-based MNCs, and Singapore's government–linked-companies (GLCs) such as Singapore Telecom, Port of Singapore Authority, and Singapore Technologies have made investments in India. There have also been some investments by Singapore's private sector companies in health care, real estate, and tourism. Singapore's role as a financial center has also been important in India's transactions with the rest of the world. Malaysia has made substantial investments in expanding capacities in selected infrastructural areas such as logistics, highways, and telecommunications in India. It has also been cooperating to assist India in providing infrastructure expertise and investments in India's energy sector, particularly for oil and gas exploration and downstream activities.

The Indian investment in ASEAN countries is very limited due to the limited capacity of the companies to invest abroad. The share of Indian investment in ASEAN increased from 0.08% in 1995 to 0.25% in 1998 and began to decline to 0.07% in 1999. It began to increase to 0.16% in 2001, however, it remained marginal compared to the other investors. The bulk of the Indian FDI flowed into Singapore. Indian investment in ASEAN countries has been wide-ranging including steel, textiles, chemicals and petrochemicals, cement, sugar, pharmaceuticals and increasingly important information technology and computer software sectors. The financial crises of 1997-98 hurt this process both ways, but lately the relationship appears to be rejuvenating

TOURISM SERVICES

Tourism industry in ASEAN countries is showing a progressive development. Countries like Indonesia, Malaysia, Philippines, and Singapore have developed considerable expertise and competitive advantage in tourism services. Vietnam is catching up fast as an important tourist destination in the recent years. India's tourism industry on the other hand has not been fully exploited despite the large potential in term of cultural and historical heritage.

In 1996, the year before the East Asian crisis, tourism receipts were highest for Thailand (USD 8.7 bn), followed by Singapore (USD 8.0 bn), Indonesia (USD 6.1 bn), Malaysia (USD 4.1 bn), India (USD 3.0 bn), and the Philippines (USD 2.7 bn) (UN-ESCAP, 1999). Tourism in ASEAN was affected by the crisis in 1997 as well as the terrorist activities in 2001 and threat of SARS. Nevertheless the tourism industry picked up again in 2002. As shown in Table 10, in terms of number of tourists, Malaysia is the top in the list, receiving 13.2 mn in 2002. However, in term of receipts, Thailand received the highest at USD7.5 bn. India received a total of 2.5mn tourists in 2002 which is 5% of the ASEAN total with receipt valued at USD3bn (or 10% of the ASEAN's receipt).

Trends in visitors arrivals from India to ASEAN-5 indicate that the total number of visitors has increased from 396.2 (1.3% of total visitors) in 1995 to 883.3 thousand (2% of total visitors) in 2002 (Table 11). Singapore appeared to be Indian's favourite destination. In 1999, Singapore attracted nearly half of all Indian visitors to ASEAN-5, followed by Thailand 31.3%, Malaysia and Indonesia about 8% each, and Philippines 3.2%. Malaysia has recently been taking aggressive steps to promote the country to capture Indian tourists. Thus, in 2002, Indian visitors to Malaysia registered at 183 360 compared to 27 701 in 1995 indicating an increase of more than five-fold.

There is no data available to indicate the flow of ASEAN visitors to India. According to Sen et al. (2004), in 2001, visitors from ASEAN countries to India numbered only 140 000, less than one– fifth of that of Indian tourist visiting ASEAN. Countrywise, visitors from Malaysia constituted the highest share of ASEAN visitors to India (41%), followed by Singapore (31%), and Thailand (13%). A similar imbalance in tourism flows is likely to prevail with respect to other ASEAN countries, the balance of trade in tourism services is likely to significantly favor ASEAN countries.

MANPOWER FLOWS

India is endowed with one of the largest pools of internationally competitive and scientific manpower that are highly demanded world wide, including ASEAN countries. There is a significant flow of Indian manpower ranging from lowly skilled labourers to highly skilled professionals to the ASEAN countries. Excess supply of labourers and professionals in India provide the offset to the shortage of manpower in Singapore, Malaysia and Thailand in particular for mid and high skill levels particularly in the ICT sectors.

Unfortunately, there is no data available to support this outflow of Indian manpower to the ASEAN region. Worldwide, Indian skilled labours have helped to offset the shortages in the USA, United Kingdom and some other Western Countries in the past two decades. According to recent estimates by the International Organization for Migration, about 1.3 million Indians lived in North America in 2001, compared to about 0.25 million in Europe and about 0.12 million in Australia and New Zealand in 2000. Among ASEAN countries, in 2001, about 28 thousand (0.028 million) Indian nationals were residing in Singapore, while about 6 thousand were residing in Malaysia (Celestine, 2004).

COMPLEMENTARITIES AND AREAS FOR MUTUAL ECONOMIC COOPERATION

The above discussion indicates that while India-ASEAN economic partnership in trade and investment relations, particularly the former, has shown impressive result, the overall performance is still much below the full potential for mutually beneficial relationship. To ensure optimum economic relations between the two regions, it is necessary to systematically examine the nature of complementarities between India and ASEAN as one entity as well as individual country level. ASEAN as an entity has an important role to play in facilitating trade and investment. The ASEAN Free Trade Area (AFTA), and the ASEAN Investment Area (AIA) have laid the foundation for greater cooperation among the ASEAN members. Besides, ASEAN holds a large number of technical meetings among members and dialogues with trading partners. The heterogeneity of ASEAN members necessitates a bilateral approach to accommodate each country's unique strengths and advantages. The following paragraphs provide a brief analysis of the prospect of economic cooperation between India and ASEAN and members.

Table 12 summarises areas of complementarities and competition as well as areas of mutual cooperation between India and ASEAN members based on the trade and investment statistics in 2002.

Indonesia-India

Indonesia is India's second largest export market in ASEAN (after Singapore) and one of India's leading export destinations among developing countries. Indonesia's market of 220 mn is the largest among India's ASEAN partners. Indonesia's strength lies in its enormous natural resources (oil, gas, coal, copper, gold, forestry and plantation products) and manufacturing for the domestic and export markets (textiles, footwear, electronics, automotive, pulp and paper). In terms of trade exchanges, both countries appear to complement each other although bilateral trade tended to be in Indonesia's favour. India is Indonesia's largest buyer of crude palm oil (CPO) indicating that India is a net importer of vegetable oils. In 2002, almost half of Indonesian exports to India were vegetable fats and oils. Other Indonesian exports to India include coal, petroleum products, copper concentrate, paper and paper board, pulp, raw cashew, chemicals, spices, textile yarn, aluminum, plywood,

leather and office equipment. On the other hand, India's exports to Indonesia include soybean meal, groundnuts, iron and steel, chemicals, textile yarn, dye, electric power and machinery, granite and marble, explosives, auto spare parts, pharmaceutical drugs, mica, castor oil. The export basket is varied and no one item is prominent, except in years when India got to export wheat and rice to Indonesia.

Indian investments in Indonesia are mainly in the areas of textiles and garments, sugar, steel and hand tools, three and two wheelers, cement, railways and infrastructures. There are around 16 Indian manufacturing joint ventures in Indonesia with direct Indian participation or financed by overseas Indians. Most of the joint ventures were set up in 1970s and 80s. Of late, Indian investors are coming to Indonesia for telecommunication, power supply and IT education projects.

The pattern of bilateral trade between India and Indonesia suggests a number of observations and implications. Firstly, food security issue is important to both countries. India relies on Indonesia (besides Malaysia) for its supply of vegetables fats (for cooking oil) and Indonesia relies on India for its supply of rice and wheat. In other words, both countries complement each other for food supply. Indonesia relies on imports of feed stuffs (particularly soyabean meal) from India for its livestock industries. This complementarity provides the scope for mutual cooperation in biotechnology and other knowledge-intensive activities to improve the productivity in the agricultural sector. The same applies in the area of food-processing industries in particular processing plants for oil extraction. In short, there exist significant avenues to enhance the cooperation in food security. Secondly, Indonesia is a major exporter of forest products to India; which suggests another potential area of expansion of bilateral trade.

Indonesia's gas and oil sector offers several opportunities for mutual cooperation. The areas of cooperation include exploration and production, establishing and upgrading refineries and gas stations, information technology, consultancy services, R&D cooperation and training. India is seeking to diversify its conventional energy sources, and significantly increase exploration of oil in its territory. India possesses enough expertise in this area as well as in the nuclear power sector, providing considerable scope for energy cooperation (Asher et al., 2001).

The other area of economic cooperation includes infrastructure development particularly in railways, aviation and in commercialization of space activities. The recent move made by the Indonesian government to ease its regulations on import of medicines to allow import of formulations, provides an opportunity for mutual cooperation in the areas of pharmaceuticals and health care. This mutual cooperation would reduce Indonesia's dependency on imported drugs and health care equipments while maintaning price of pharmaceutical products at reasonable level. In the area of information technology, India has much to offer Indonesia particularly in software development and also IT education. Indonesia also plans to establish a technology park, a project that India's IT specialists could provide technical expertise and training.

Malaysia-India

The bilateral trade between India and Malaysia is heavily in favour of Malaysia. India's imports of Malaysia products have increased more than its exports to Malaysia. Besides Indonesia, India imports vegetable oil from Malaysia. In fact India is one of the major importers of Malaysia palm oil besides China and Pakistan. In 2002, palm oil accounted for 38.8% of Indian imports from Malaysia. This is followed by electronic goods (23.5%), wood and wood products (10.1%), organic chemicals (6.7%) and man made fabrics and spun yarn (92.7%). On the other hand, Indian exports to Malaysia were sugar (10.8%), meat preparations (10.4%), non-basmati rice (6.9%), cotton yarn, fabrics, made ups etc (5.1%) and wheat (3.8%).

The above pattern of trade flow between the two countries suggests a lot of room for further trade expansion. For instance, there is room for exports of Malaysian computer hardware and peripherals including microchips, consumer electronics and business machines to India. On the other hand, the potential Indian exports to Malaysia include; paper and wood products, transport equipments, gems and jewellery, rubber, groundnuts, man-made yarns and fabrics, dye and coal tar chemicals and glassware.

The progress of the Malaysian economy since the late eighties and the liberalization of the Indian economy since 1991 have triggered a sharp turn around in bilateral commercial and economic relations. Malaysian companies are aggressively looking to enter into India wit both capital and expertise in areas such as road buildings, telecommunications, ports, automotive components, petroleum, tourism, property development and software. Malaysia's FDI in India include fuel, power and oil refinery sectors, telecommunication, electrical equipment, photographic raw film and paper and transportation industry. The highest technical collaborations have been in the electrical equipment followed by food processing, telecommunications, rubber goods and hotel

and tourism. Indian involvement in Malaysia is in palm oil refining, power, railways, civil construction, training and information technology.

Malaysia has embarked on a massive programme (such as Multimedia Super Corridor) of turning the country as an important centre for information technology. It has invested heavily in infrastructure development but lacks the skilled labour in IT. On the other hand, India has excessive supply of highly skilled professionals in the areas of IT. Hence, IT is an area where Malaysia and India could work in a mutually beneficial cooperation both in software development and training. Malaysia is also embarking on a programme to spearhead its biotechnological research and development to help increase its agricultural productivity. Under the Malaysia Eighth Malaysia Plan, agriculture is envisaged to be the third engine of growth in the country. Hence, the government is investing heavily in agriculture in particular agro-biotechnological development. This would provide an area of mutual cooperation between India and Malaysia as agriculture in both countries are still "undeveloped" in terms of biotechnological applications.

India and Malaysia had for a long time established a strong relationship in the areas of education and training in the field of medical education. That is, India is one of the major centres for medical education for Malaysian students. This collaboration could be further expanded in the area of information technology. Given the rapidly rising health care costs in Malaysia, opportunities exist in health care activities and in generic and other drugs including HIV-AIDS.

Malaysia has the capital and experience to assist India in providing infrastructure expertise and investments. The Malaysian businesses have been successful in securing contracts for building roads and highways in India. The prospect for mutual cooperation in the area of oil and gas exploration and in downstream processing activities appears good.

Philippines-India

Given the potential of these two countries, India-Philippine bilateral trade is comparatively small. India's exports to the Philippines constitute only 0.8% of total Philippine imports. Indian exports to the country suffered during '98 and '99 due to the Asian financial crisis. During 2000 and 2001 Indian exports have recovered considerably recording a healthy growth of 23% and 43% respectively. India's major exports to Philippines in 2001 in order of importance were buffalo meat, yarn, rice and wheat, electrical and electronic machinery, transport equipment, pharmaceutical products and oil cake. On the other hand, major imports from the Philippines to India were newsprint, phosphoric acid, gear boxes, semi conductors and parts and accessories of motor vehicle. These data show the importance of India as the major supplier of food (meat and cereals) to the Philippines. Philippines reciprocated by supplying inputs such as phosphoric acid, semiconductors, news print and transport equipments for India's heavy industry and ICT sectors.

Indian investments in the Philippines are mainly confined to the areas of textiles and IT. In the area of IT, Indian companies are opening up firms providing network solutions and IT educational training centres. Indian companies were also awarded contracts in transmission line and geothermal projects. The potential sectors for Indian investment in Philippines include textile machinery, drugs and pharmaceuticals, software development and training, steel and metal, manufacturing and design of gold jewellery, engineering consultancy and transport equipment.

Philippines investments in India are primarily confined in the fields of telecommunications, reprocessing of waste and human resource development in the field of management education. The potential sectors for Philippines investments in India include food processing, fashion designing, packaging of products, telecommunication, coconut based products and tourism.

Areas of mutual cooperation for these two countries lie in the areas of IT, pharmaceuticals, railways, embryo biotechnology, agriculture and food processing. Philippines and India are internationally competitive in selective niches in the ICT sector. However, they could still work together to pursue mutually beneficial opportunities. The possible area for cooperation include cartoon animation i.e., an area which the Philippines has a clear competitive advantage compared to other ASEAN countries and even India. Hence, India's strength in software could be combined with Philippines' strength in graphics and designing in a mutually beneficial manner. Like Indonesia, Philippines is also keen to develop an information technology park following the model of the same in Bangalore. The other potential areas include call service centres, shared financial services, software development services and construction related engineering and design.

The prices of pharmaceutical products in the Philippines were as high as 20 times those in India. The Philippines government has instituted programmes to reduce the price of drugs and pharmaceuticals through allowing

cheaper imports from India and some other structural changes in drugs distribution. Given the size of the Philippines market and the advances made by the Indian pharmaceutical industry, the potential cooperation and mutual gain is enormous.

The Philippines government has proposed to rehabilitate the country's six existing railway lines and other infrastructural development. Given India's experience in railway technology, this provides an opportunity for Indian companies to work together with local counterparts in rehabilitating the lines. Since agriculture in both countries are important, cooperation could be established in the areas of embryo biotechnology to produce high genetic buffalo embryos as well agriculture and food processing.

Singapore-India

Singapore is India's largest trading and investment partners in ASEAN. Singapore is a manufacturing, trading, and financial services centre, and is now focusing on hi-tech areas. The increasingly close relations between India and Singapore in recent years have been characterized by a dramatic growth in bilateral trade and investment linkages. The two economies are in synergistic in needs. i.e., India is looking for infrastructure investments, critical technology and export markets. Singapore on the other hand has surplus capital and a useful partner in infrastructure development in India as well as investment in Indian companies. Singapore is well ahead of her ASEAN counterparts in taking advantage of mutual collaborations with India.

In terms of trade the major items of India's export to Singapore include electrical and electronic products, machinery and transport equipment, chemicals, food, mineral fuels, crude materials, beverages and tobacco and other manufactured items. Major items exported to India include machinery and transport equipment, mineral fuels, chemicals, computer and computer peripherals, electrical and electronic products, crude materials, food, beverages and tobacco. In terms of investment, Singapore has emerged amongst the top foreign investor in India. Some of the Singapore investments in India are done through Government Linked Corporations (GLCs) of Singapore which are involved in projects such as Information Technology Park in Bangalore. The Port of Singapore Authority is involved in equity and management of Pipavav port, Tuticorin port and joint ventures with local corporation in telecommunication projects. The Government of Singapore Investment Corporation (GIC) has registered itself in India as a Financial Institutional Investors, investing in stock and equities.

The emerging opportunities of mutual cooperation between Singapore in India are largely in the services sector, particularly in ICT, logistics services, business and financial services, tourism and health services (Asher et al.,2001). The importance of the IT industry in both Singapore and India provides a strong ground for further cooperation. Singapore has a well developed infrastructure and capital surplus while India has trained human capital. A large number of opportunities exist for designing, manufacturing, distribution and trading of commodities in which software is an important input. Hence, Indian IT professionals could contribute to the development of software applications for these processes. The Indian software companies have achieved significant progress in the areas financial services, manufacture, marketing and distribution, infrastructure sector like railway, transport, port etc. electric and engineering, telecommunication and education, health and medical services. Clearly there exists a complementarity in the needs of the two countries. Besides, Singapore is strategic to Indian companies as it functions as a hub for linkages to other ASEAN and Asian countries in the region. The other obvious areas for mutual cooperation are tourism, health services, education, business and financial services. The cooperation in these areas by both countries are progressing very well.

Thailand-India

Trade between India and Thailand has been steadily expanding in recent years. However in 1997 due to economic problems faced by the East Asian region, Indian exports to Thailand declined. The subsequent years have shown consistent increase in bilateral trade and the balance of trade is in India's favour. The major Indian exports to Thailand include gems and jewellery, non-ferrous metal, marine products, inorganic/organic and agro-chemical products. Major Indian import from Thailand include electronics goods, machinery, artificial resins, plastic materials, textile yarns, fabric made up articles, man made fibre and spun yarn.

India's investments in Thailand are in the areas of high tech and even capital intensive and cover a wide range of products and activities including pulp, chemicals, pharmaceuticals, textiles, nylon, tyre cord and real estate. India is the thirteenth largest investor in Thailand. In 2001, Thai investments in India accounted for 0.96% of the total FDI approved in India. The top 5 sectors in terms of amount of FDI approved were telecommunication, followed by hotel and tourism, food processing, chemicals excluding fertilizers and electrical equipment.

Like other ASEAN countries, Thailand aims to develop knowledge-based economic activities but lacks the technical manpower particularly in the IT sector. Thailand is keen in setting up a Software Technology Park similar to STPI in India. They also plan to develop a Cyber City on the lines of one set up in Bangalore. Once again India could provide the manpower and expertise to help the Thai IT sector.

The incidence of HIV-AIDS in Thailand is one of the highest in ASEAN. Thailand has taken measures to address this issue and greater cooperation between Thailand and Indian pharmaceutical industry could help curb this problem. The other area for potential cooperation is the gems and jewellery sector. Both countries have thriving gems and jewellery industry. Greater cooperation between the two could provide each with competitive advantages in the international arena. The India-Thailand-Myanmar trilateral cooperation in the roads sector provides opportunities for further cooperation for the three countries in the area of roads and highway construction, shipping, tourism and human resource development. The other specific areas of cooperation include improved transport and telecommunication network, energy including conventional and non-conventional sources, science and technology including IT, biotechnology and pharmaceuticals, education and HRD (particularly to establish network among institutions of higher learning given that Asia has world-class institutions in management, medicine, environmental science etc.).

Vietnam-India

The main items of Indian exports to Vietnam in 2002 were drugs and pharmaceuticals (16.8%), materials for plastics (10.8%), seafood (8.5%), iron and steel (5.9%), machinery and equipment (5.8%), chemicals (4.9%), pesticides (3.5%). Recent exports include crude oil, fertilizers, CKD and IKD motobikes. On the other hand, India imports crude oil (32.1%), pepper (19.1%), tea (14.5%), leather and made ups (2%), rubber (2%), cinnamon (1.8%), electric components (1.9%) and coal (1.3%). The balance of trade has been heavily in favour of India since the Vietnamese exports to India have remained small in value. The primary reason for trade in favour of India is the similarity in exports of both countries, i.e., both countries are exporting items such as garments, footwear, rice, cashew, tea, coffee, pepper, rubber, marine products etc.

Indian investments in Vietnam are mainly in oil and natural gas exploration, sugar production, edible oil, pharmaceuticals, office furniture and plastic sectors. Potential areas for mutual cooperation include agricultural research and biotechnology to boost cereal production in both countries. Facilitating trade and investments in agro chemicals and fertilizers also merit serious consideration. The two countries could also work collaboratively in the areas pharmaceuticals and healthcare particularly in the area of sourcing drugs for diseases like HIV-AIDS

PROSPECT

The previous sections have discussed the current status of trade and investments between ASEAN nations with India and identification of areas of complementarities, competition and mutual cooperation. The discussion suggests that despite the existence of vast opportunities of mutual collaborations between the two entities, it has not been fully exploited. India's recent emergence as an active partner in Asian market could explain for the lackluster performance. That is Indian economy began its "openness" policy only in the early 1990s and hence its presence in the ASEAN market as an active participant can be considered new compared to their traditional markets such as their former colonial masters in Europe as well as in Far East, North America and other regions. ASEAN trade in the past had been closely linked with the European market, China, Japan and Korea. As mentioned by Hor Namhong (2002) greater exchanges at all levels are necessary to increase the presence of India in ASEAN trade and investment. The advent of 1997 crisis has somewhat retarded temporarily the progress of trade and investment between the two entities particularly Malaysia, Thailand and Indonesia. Since 1999, the situation has somewhat improved.

Despite the slow take off, the prospect of ASEAN-India commercial relations never looked better. The emerging opportunities between ASEAN and India lie in the following areas; (i) ICT; (ii) pharmaceuticals and health care and equipments; (iii) tourism; (iv) infrastructure; (v) oil and natural gas exploration; (vi) biotechnology and life sciences; (vii) educational services; (viii) logistics; (vix) textiles and garments; (x) manpower flows and (xi) commercial use of nuclear and space technologies. In the area of ICT, without doubt India has a competitive edge in software development and it is one of the major global players besides USA, Japan, Korea and Taiwan. Indian ICT specializes in web-technology, e-commerce, software product development, software maintenance and migration and data base management. Besides, India has an excess of trained workers and professionals in this field. On the other hand, most of ASEAN countries have geared themselves towards information driven economy but lack the expertise (particularly Malaysia and Thailand). Clearly these "lack of IT trained

manpower" countries could benefit from collaboration with Indian IT industry both in terms of manpower and education.

In most ASEAN countries, the pharmaceutical industry has not developed and hence their dependence on imports from either European or far eastern countries which are higher in price. Generally the domestic price levels of drugs and pharmaceutical products are higher in ASEAN countries compared to the level in India. Besides, the wide spread of HIV-AIDS diseases in some of ASEAN countries such as Thailand and Vietnam, pharmaceutical collaboration with India would help the countries to curb this problem besides reducing the price to consumers. War stricken countries like Vietnam and Cambodia would benefit from this collaboration as there are still large number of war victims that are deformed through lost of limbs and diseases. India is said to be able to provide cheaper artificial limbs to these victims besides drugs and pharmaceuticals.

Tourism is one of the major sources of income of most of ASEAN countries. Recent terrorist activities in the west has pulled Middle Eastern visitors into the region and hence the increase in number of visitors and receipt in the ASEAN region lately. India, despite being rich in cultural and historical heritage has not been able to attract visitors. Inter country tourism between ASEAN and India has not developed as fast as intra ASEAN tourism. Clearly, there exists a vast opportunity for the two countries to boost the tourism industry between he two region through mutual collaboration.

Agriculture and hence food security and safety are important concerns to ASEAN and India alike. The concern to increase productivity through biotechnological innovation is an urgent agenda for both food deficit and surplus countries. Food production in ASEAN in particular rice is highly susceptible to natural calamities and hence unstable which makes food security a difficult target to achieve. With the exception of Thailand and Singapore, in some ASEAN countries, the food processing sector has not developed. This provides an opportunity for Indian biotechnologists to help improve biotechnological research as well as exporting some food processing technologies to the ASEAN region. India is the major consumer of Malaysian and Indonesian palm oil. Hence there is a prospect for further collaboration in processing sector in particular oil extraction from plants technology.

As the economy progresses, the infrastructural requirement increases correspondingly. Malaysia has vast experiences in building roads and highways, housing construction, Singapore in ports and logistics and India in railways construction. Together these countries could help improve the infrastructure in India and ASEAN countries.

India and ASEAN compete in the areas of textile and apparels, gems and jewellery and to certain extent some ICT sectors. Nevertheless, collaboration could ensure better competitiveness in the world market. The advancement of space technology in India could be shared with ASEAN countries through the use of remote imaging satellites for economic purposes such as to reclaim farmland, identifying remote areas for development, as well as predicting natural disasters.

CONCLUSION

The above deliberations suggest that ASEAN and Indian economies complement each other more than they compete. India's assets for ASEAN countries includes its large diversifies and liberalized economy, reservoir of manpower and scientific talent, natural resources, industrial base and one of the largest rapidly growing markets. ASEAN on the other hand offers India its rich natural resources, know-how, infrastructure, social sector development, investment capital, elaborate regional and global linkages in trade and industry and large market. ASEAN today has a combined population of 530 mn people, total GDP of USD 632.5 bn and a trade turnover of nearly USD500 bn together with its natural and energy resources. An FTA between ASEAN and India is the bridge for trade and investment ASEAN-India ties. Hence, mutual collaboration should provide an avenue to expedite growth and better resource utilization for both countries.

The under-exploitation of these potential economic collaborations is more than just an economic exercise. The prospect of these economic cooperations to materialize requires more than just market forces to pull and move the human, capital, technological factors between borders. It requires high level political commitment to spearhead the facilitation towards greater collaboration between the two entities. The groundwork for a significant expansion and intensification of economic ties is now in place with the establishment of the Framework Agreement for establishing a FTA . The two sides are also drawing up a roadmap called "Vision 2020" which is expected to be adopted at the Third ASEAN-India Summit in Laos in 2004 (Gaur, 2003). They have also agreed to undertake common efforts to help fight international terrorism and transnational crime, particularly the trafficking of drugs, weapons and humans. Steps should be taken to turn the current ASEAN plus Three (China, Japan and Korea) grouping to ASEAN plus Four by including India. This would also be an

important step in moving towards the operationalization of the bolder vision of establishing a larger Asian Economic Community (Asher and Srivastava, 2003).

While all these are happening at the political fora and arena, the progress has been disappointing. As concluded by Sen et al., (2004), there is a dearth of mutual understanding and appreciation from both parties in particular among the ASEAN elites on the benefits of deepening engagement with India. For instance there is a curious lack of expertise about or interest in India in ASEAN universities, think tanks and the media. This results in lack of trust and confidence in each other in operationalising the collaboration. Until and when these ideological and informational blinders are lifted, the prospect of realizing the benefits of mutual collaboration may be distant at this point in time.

REFERENCES

ASEAN Secretariat. 2003. ASEAN FDI Statistics Database.

ASEAN Secretariat. 2003. Website of the ASEAN Secretariat, http://www.aseansec.org.

Asher, M.G and S. Srivastava. 2003. "India and the Asian Economic Community", *Discussion Paper No. 5*3, Research and Information Systems for the Non-Aligned and Developing Countries (RIS), New Delhi, India.

Asher, Mukul, Rahul Sen and Sadhana Srivastava. 2001. "ASEAN-India: Emerging Economic Opportunities," paper prepared for ASEAN-india workshop on Economic Issues organized by the French center de Sciences Humaines, Institute of South East Asian Studies, Singapore, and School of International Studies, Jawaharlal Nehru University, New Delhi, march 17 – 18.

Celestine, A. 2004. "The pattern that is India", *Business Worl*d, January 5. Centre for Monitoring Indian Economy (CMIE). 2000. Foreign Trade and Balance of Payments, CMIE, Mumbai, India, October.

Gaur, S. 2003. "ASEAN-India Ties Entering a New Phase", *Business Time*s, Singapore, October 8.

Goswami, O. 2003. "India 2003-2010: Economic and Political Scenarios", Confederation of Indian Industry (CII), April.

Hor Namhong (2002). ASEA-India Summit Partnership: Challenges and Prospects, in India – ASEAN partnership in an Era of Globalisation, Reflections by Eminent Persons, New Delhi: Research and Information System for Non-Aligned and Other Developing Countries.

http://www.ris.org.in/july2004.html

http://www.undp.org (accessed on 10 October 2004)

http://www.weforum.org (accessed on 10 October 2004)

India (2004). Centre for Monitoring Indian Economy, Foreign Trade & Balance of Payments.

International Monetary Fund (IMF). 2001. *International Financial Statistics Yearboo*k.

Morgan Stanley. 2003. "India Economics: The Next Trillion-Dollar Economy", Equity Research Asia/Pacific, January 27

Nathan K.S. (ed.) (2000). India and ASEAN: The Growing Partnership for the 21st Century. Institute of Diplomacy and Foreign Relations, Kuala Lumpur: Government Printers of Malaysia.

Secretariat for Industrial Assistance (SIA). 2003. *SIA Newslette*r, Government of India, January.

Sen Rahul, Mukul G. Asher and Ramkishen S. Rajan (2004). ASEAN-India Economic Relations: Current Status and Future Prospects, Discussion Paper in RIS Diary, Vol. 2(3), July.

UNDP (2003). Human Development Report

UN-ESCAP, *Statistical Yearbook for Asia and the Pacifi*c, 1999

Wilson, P. and R. Purushothaman. 2003. "Dreaming with BRICs: The Path to 2050", New York: Goldman Sachs, *Global Economics Paper No. 9*9.

World Economic Forum (2004). World Competitiveness Repot.

Table 1: Comparison of Demographic and Economic Profiles of India and ASEAN Countries, 2002

1a: Population, Population Structure and Labour Force, 2002

Country	Population (mn)	Density (per sq km)	Urba-nisation	Labour Force			Population Structure		
				Agricul-ture	Industry	Service	<14 yrs	15-64 yrs	>65 yrs
India	1033.2	314	1.8	59	17	23	32.2	63.0	4.8
ASEAN	530.4	84.9	41	46.6	28.7	31.2			
Cambodia	13.5	13	18	69.7	na	na	39.9	57.6	3.1
Indonesia	211.1	211	42	47.7	16	36.3	29.7	65.4	4.9
Malaysia	24.5	24	58	17.9	54.1	28	31.7	61.9	4.4
Myanmar	52.2	52	2	69.6	7	7	28.1	67.0	4.9
Philippines	81.8	82	59	45.5	15	15	36.2	59.9	3.9
Singapore	4.2	4	100	0.1	65	35	17.3	75.5	7.2
Thailand	63.4	63	20	55.7	15	0.15	24.2	68.8	7.0
Vietnam	79.7	79	25	66.9	na	na	30.2	64.2	5.6

1b: Structure of Output and Consumer Price Index, 2002

Country	Structure of output (%)			Price Index	
	Agriculture	Industry	Services	CPI 2000=100	Annual change
India	25	25.9	49.2	477	4.1
ASEAN	22.9	33.4	44.2	128.125	9.3
Cambodia	35.6	28	36.4	103	3.3
Indonesia	17.5	44.5	38.1	262	11.9
Malaysia	9.1	48.3	46.4	103	1.8
Myanmar	57.2	10.5	32.4	288	57
Philippines	14.7	32.5	52.8	167	3.1
Singapore	0.1	33.6	66.6	101	-0.4
Thailand	9	42.5	48.5	104	0.7
Vietnam	40.2	27.4	32.5	0	0

1c: Balance of Payment, 2002

Country	Balance of Payment (% of GDP)			Current Account Balance	Overall Balance
	Export	Import	Trade Balance		
India	9.2	-11.8	-2.6	0	1.8
ASEAN	62.5	-56.5	6.1	6.3	2.5
Cambodia	44.1	-57.7	-13.6	-1.7	4.3
Indonesia	33.5	-20.1	13.4	4.2	2.1
Malaysia	98.1	-79.1	19.1	7.6	3.9
Myanmar	na	na	na	Na	na
Philippines	44.1	-43.6	0.5	5.4	0.8
Singapore	147.5	-126.2	21.3	21.5	1.5
Thailand	52.9	-45.2	7.7	6	3.3
Vietnam	na	na	na	Na	na

1d: Gross National Income, External Debt and Ratio of Trade to GDP

Country	GNI (USD bn)		GNI per capita (USD)		External Debt		Trade/GDP
	Current Value	PPP	Current value	PPP	USD bn	%ofGNI	%
India	494.8	2778	470	2650	104.4	21.1	30.8
ASEAN	546.4	1947	3587.5	6363.8	40.3	7.4	132.3
Cambodia	3.8	25	300	1970	2.9	76.3	126.6
Indonesia	149.9	650	710	3070	132.2	88.2	65.1
Malaysia	86.1	207	3540	8500	48.6	56.4	210.7
Myanmar	na	na	na	Na	6.6	na	1.5
Philippines	62.4	356	1030	4450	59.3	95.0	98.4
Singapore	86.1	99	20690	23730	0	0.0	318.7
Thailand	123.3	425	2000	6890	59.2	48.0	122.2
Vietnam	34.8	185	430	2300	13.3	38.2	115

1e: Foreign Direct Investment and GDP Growth

Country	FDI		GDP Growth (%)	
	USDbn	% of GNI	1996-2000	2002
India	3	0.6	5.7	4.6
ASEAN	12.4	29.9	2.2	5.4
Cambodia	0.5	13.2	0	5.5
Indonesia	-0.9	-0.6	-1	3.7
Malaysia	3.2	3.7	3.4	4.2
Myanmar	0.1	0.0	0	9.7
Philippines	1.1	1.8	3	4.4
Singapore	6.1	7.1	6.4	3.3
Thailand	0.9	0.7	-0.9	5.4
Vietnam	1.4	4.0	6.4	7
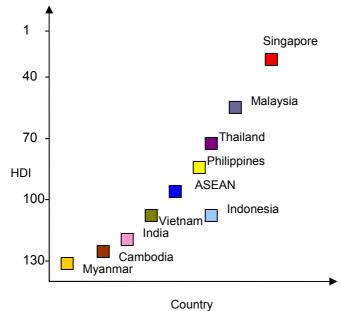
1f: Human Development Index and Competitiveness Ranking

Country	HDI	Competitiveness Ranking 2002	
		1999	2002
India	127	52	56
ASEAN	74.75	20	41
Cambodia	130		-
Indonesia	111	37	72
Malaysia	59	16	29
Myanmar	132		
Philippines	83	33	66
Singapore	25	1	6
Thailand	76	30	32
Vietnam	112		60

Source: Table 1a-1e: Asian Development Bank, 2003
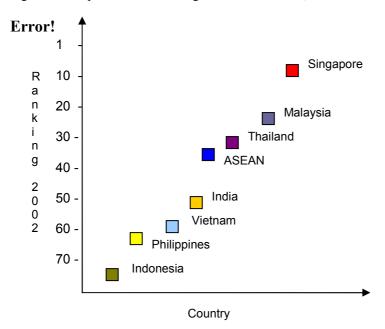
Table 1f: UNDP, 2003 and World Economic Forum, 2004

Figure 1: Human Development Index: ASEAN and India, 2002

Source: UNDP, 2003

Figure 2: Competitiveness Ranking: ASEAN and India, 2002

Source: World Economic Forum, 2004

Table 2: India's Merchandise Exports to ASEAN, 1991-1992 to 2001-2002

India's Export to	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
World (USD mn)	17998.3	18538.8	22213	26337.5	31841.9	33498	35048.7	33211	36760	44147	43708
ASEAN-6 (USD mn)	1022.3	1242.9	1675.1	1899.6	2702.8	2851.6	2419.6	1589.2	2190.3	2813.7	3383.6
Share in ASEAN (%)	100	100	100	100	100	100	100	100	100	100	100
Share in Total Exports (%)	5.7	6.7	7.5	7.2	8.5	8.5	6.9	4.8	6	6.4	7.7
Indonesia (USD mn)	149.5	138.5	234.7	277.8	663.4	592.3	437.8	185.2	325.1	394.9	539.3
Share in ASEAN (%)	14.6	11.1	14	14.6	24.5	20.8	18.1	11.7	14.8	14	15.9
Share in Total Exports (%)	0.8	0.7	1.1	1.1	2.1	1.8	1.3	0.6	0.9	0.9	1.2
Malaysia (USD mn)	203.9	189.9	247	286.6	393.8	531.6	490.5	321.6	447.2	601.1	773.6
Share in ASEAN (%)	19.9	15.3	14.7	15.1	14.6	18.6	20.3	20.2	20.4	21.4	22.9
Share in Total Exports (%)	1.1	1	1.1	1.1	1.2	1.6	1.4	1	1.2	1.4	1.8
Philippines (USD mn)	64.7	54.7	58.2	99.5	144.5	183.8	239	118.7	143.7	201.6	248
Share in ASEAN (%)	6.3	4.4	3.5	5.2	5.3	6.4	9.9	7.5	6.6	7.2	7.3
Share in Total Exports (%)	0.4	0.3	0.3	0.4	0.5	0.6	0.7	0.4	0.4	0.5	0.6
Singapore (USD mn)	391	588.9	751.2	770.5	903	978.3	780.7	517.3	669.8	862.4	970.1
Share in ASEAN (%)	38.2	47.4	44.8	40.6	33.4	34.3	32.3	32.6	30.6	30.7	28.7
Share in Total Exports (%)	2.2	3.2	3.4	2.9	2.8	2.9	2.2	1.6	1.8	2	2.2
Thailand (USD mn)	200.1	253.7	356.1	406.7	473.6	447.5	344.9	320.9	449.9	528.7	634.7
Share in ASEAN (%)	19.6	20.4	21.3	21.4	17.5	15.7	14.3	20.2	20.5	18.8	18.8
Share in Total Exports (%)	1.1	1.4	1.6	1.5	1.5	1.3	1	1	1.2	1.2	1.5
Vietnam (USD mn)	13	17.4	28	58.6	124.6	118.2	126.8	125.4	154.6	25	217.9
Share in ASEAN (%)	1.3	1.4	1.7	3.1	4.6	4.1	5.2	7.9	7.1	8	6.4
Share in Total Exports (%)	0.1	0.1	0.1	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5

Source: Calculated from CMIE, Foreign Trade & Balance of Payments, Centre for Monitoring Indian Economy.
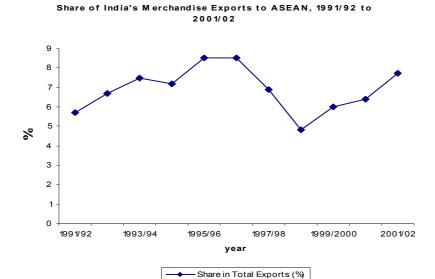
Figure 3: Share of India's Merchandise Exports to ASEAN, 1991/92-2001/02
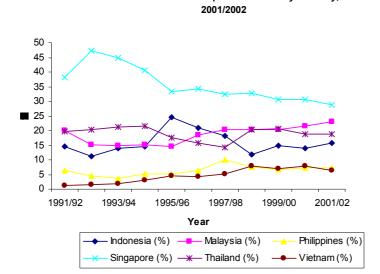
Figure 4: Share of India's Merchandise Exports to ASEAN by Country, 1991/92-2001/02

Table 3: India's Merchandise Imports to ASEAN, 1991-1992 to 2000-2002

India's Export to	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
World (USD mn)	19554.9	21883.5	23304.9	28662.2	36729.8	39165.5	41534.6	42379.2	49798.6	50056.3	51261.3
ASEAN-6 (USD mn)	1274.6	1226.7	1101.7	1940	2688	2921.1	3382.3	4142.6	4918.9	3876.14[a]	3991.57[b]
Share in ASEAN (%)	100	100	100	100	100	100	100	100	100	100	100
Share in Total Imports (%)	6.5	5.6	4.7	6.8	7.3	7.5	8.1	9.8	9.9	6.4	7.8
Indonesia (USD mn)	67.4	60	119.5	322.3	461.8	599.2	732.5	828.9	960	394.9	1039.2
Share in ASEAN (%)	5.3	4.9	10.8	16.6	17.2	20.5	21.7	20	19.5	14	26
Share in Total Imports (%)	0.3	0.3	0.5	1.1	1.3	1.5	1.8	2	1.9	0.9	2
Malaysia (USD mn)	392	405.8	249.2	490.2	904.1	1042.2	1180.3	1610.4	2026.5	601.1	1137.3
Share in ASEAN (%)	30.8	33.1	22.6	25.3	33.6	35.7	34.9	38.9	41.2	21.4	28.5
Share in Total Imports (%)	2	1.9	1.1	1.7	2.5	2.7	2.8	3.8	4.1	1.4	2.2
Philippines (USD mn)	31.5	9.8	5.9	11.8	21.5	16.5	27.8	37.3	56.3	201.6	91.6
Share in ASEAN (%)	2.5	0.8	0.5	0.6	0.8	0.6	0.8	0.9	1.1	7.2	2.3
Share in Total Imports (%)	0.2	0	0	0	0.1	0	0.1	0.1	0.1	0.5	0.2
Singapore (USD mn)	696.3	632.1	626.1	900	1115.2	1064.2	1199.3	1383.9	1536.3	862.4	1298.9
Share in ASEAN (%)	54.6	51.5	56.8	46.4	41.5	36.4	35.5	33.4	31.2	30.7	32.5
Share in Total Imports (%)	3.6	2.9	2.7	3.1	3	2.7	2.9	3.3	3.1	2	2.5
Thailand (USD mn)	48.9	58.3	57.2	171.7	170	197.4	233.6	273.1	328.2	528.7	424.5
Share in ASEAN (%)	3.8	4.8	5.2	8.8	6.3	6.8	6.9	6.6	6.7	18.8	10.6
Share in Total Imports (%)	0.2	0.3	0.2	0.6	0.5	0.5	0.6	0.6	0.7	1.2	0.8
Vietnam (USD mn)	38.5	60.6	43.8	44.1	15.5	1.7	8.7	9.1	11.7	225	-
Share in ASEAN (%)	3	4.9	4	2.3	0.6	0.1	0.3	0.2	0.2	8	-
Share in Total Imports (%)	0.2	0.3	0.2	0.2	0.04	0	0.02	0.02	0.02	0.5	-

Note: [a] The data for Vietnam is only available from April to September for the year, 2000-2001

[b] refers to only ASEAN-5 countries for the year, 2001-2002 (excluding Vietnam)

Source: Calculated from CMIE, Foreign Trade & Balance of Payments, Centre for Monitoring Indian Economy, October 2000
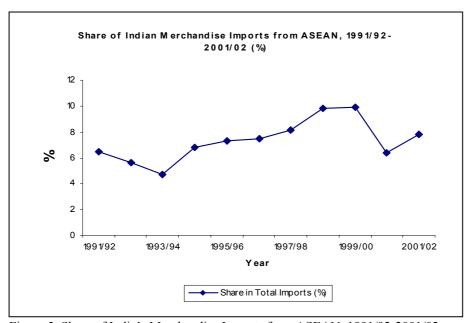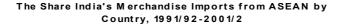
Figure 5: Share of India's Merchandise Imports from ASEAN, 1991/92-2001/02
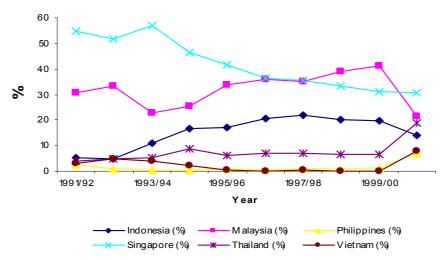
Figure 6: Share of India's Merchandise Imports to ASEAN by Country, 1991/92-2001/02

Table 4: India's Bilateral Balance of Merchandise Trade with ASEAN 6, 1991-92 to 1999-2000 (USD mn)

Year	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam	ASEAN 6	India/World*
1991-92	82.1	-188.1	33.2	-305.3	151.2	-25.5	-252.3	-1556.6
1992-93	78.5	-216	44.9	-43.2	195.3	-43.3	16.3	-3344.7
1993-94	115.2	-2.1	52.2	125.1	298.9	-15.8	573.5	-1091.9
1994-95	-44.5	-203.6	87.7	-129.5	235.1	14.5	-40.4	-2324.7
1995-96	201.6	-510.3	123	-212.2	303.7	79.1	-15.2	-4887.7
1996-97	-6.8	-510.7	167.3	-85.9	250.1	116.5	-69.5	-5667.5
1997-98	-296.6	-698.5	208.3	-459.5	104.4	112.7	-1029.2	-7513.6
1998-99	-642.2	-1292.7	79.1	-863.9	46.6	115.9	-2557.2	-8728.2
1999-2000	-665.1	-1623.8	87.1	-816.3	135.9	132.3	-2749.9	-9625.2

Note: * India's overall Balance of Trade

Source: Calculated from Centre for Monitoring Indian Economy, Foreign Trade, various issues

Table 5: ASEAN Export to India by Product (USD '000)

Section	1993 USD	%	1995 USD	%	2000 USD	%	2001 USD	%	Rate of Growth (%)
Live Animal	607.8	0.0	862.3	0.0	2,216.0	0.0	2,368.8	0.0	6.7
Vegetable Products	40,598.0	2.7	46,468.6	1.6	225,739.8	3.4	308,215.8	5.0	10.2
Fats and Oils	71,825.5	4.8	504,668.4	17.9	1,067,883.8	16.3	848,996.2	13.7	12.9
Prepared Foodstuffs	33,162.4	2.2	37,250.9	1.3	42,024.1	0.6	39,095.0	0.6	1.2
Mineral Products	308,946.6	20.8	411,103.8	14.6	1,146,437.2	17.5	909,234.7	14.6	7.3
Chemicals	111,050.1	7.5	225,089.1	8.0	542,938.3	8.3	579,203.0	9.3	8.8
Plastics	62,071.3	4.2	99,681.8	3.5	230,800.9	3.5	195,718.1	3.2	7.0
Hides and Leather	1,249.7	0.1	2,932.2	0.1	7,569.7	0.1	7,407.9	0.1	8.6
Wood and Wood articles	32,649.0	2.2	42,456.3	1.5	220,171.1	3.4	238,512.2	3.8	11.4
Pulp and paper	23,014.6	1.6	49,797.3	1.8	111,733.9	1.7	146,829.3	2.4	8.9
Textiles and apparel	31,746.0	2.1	79,015.9	2.8	201,107.5	3.1	220,421.7	3.5	9.1
Footwear	1,565.6	0.1	2,921.0	0.1	3,057.1	0.0	3,374.4	0.1	4.7
Stone/Cement/Ceramics	17,236.5	1.2	29,429.4	1.0	53,573.4	0.8	36,247.0	0.6	3.9
Gems	17,193.8	1.2	89,581.0	3.2	71,367.6	1.1	170,971.7	2.8	5.6
Base metal and Metal articles	330,400.0	22.3	181,794.7	6.4	264,460.6	4.0	290,611.0	4.7	1.8
Machinery and Electrical Appliances	294,224.4	19.8	782,559.6	27.7	1,986,430.7	30.3	1,882,869.3	30.3	9.5
Vehicles	18,398.3	1.2	84,661.5	3.0	130,828.0	2.0	74,365.0	1.2	3.7
Optical, precision & musical instruments	33,144.5	2.2	67,175.9	2.4	123,272.6	1.9	135,818.4	2.2	6.7
Arms	0.0	0.0	0.0	0.0	0.0	0.0	10.4	0.0	5.1
Miscellaneous Manufactured articles	7,787.3	0.5	9,090.4	0.3	22,419.1	0.3	24,075.7	0.4	5.8
Antiques and works of art	47,081.5	3.2	74,380.7	2.6	84,356.6	1.3	84,239.6	1.4	3.6
Other	0.0	0.0	131.2	0.0	17,214.5	0.3	12,389.1	0.2	57.3
ALL	1,483,952.9	100.0	2,821,052.0	100.0	6,555,602.4	100.0	6,210,974.2	100.0	

Note: Figures cover only Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand (1993 - 1998)

Figures cover only Brunei Darussalam, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (1999)

Figures cover only Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (2000 - 2001)

Source: ASEAN Statictical Yearbook, 2003

Table 6: ASEAN Import from India by Product (USD '000)

Product	1993		1995		2000		2001		Rate of
	USD	%	USD	%	USD	%	USD	%	Growth (%)
Live Animal	43,670.0	3.1	108,104.6	5.9	216,398.8	6.7	219,590.9	6.0	7.5
Vegetable Products	69,934.5	4.9	191,577.9	10.4	146,836.9	4.6	242,783.9	6.6	3.7
Fats and Oils	1,523.3	0.1	4,283.1	0.2	16,530.8	0.5	13,494.2	0.4	12.2
Prepared Foodstuffs	232,278.8	16.2	171,022.0	9.3	269,040.7	8.4	272,826.0	7.4	0.4
Mineral Products	97,883.2	6.8	70,567.2	3.8	217,029.9	6.8	172,848.2	4.7	3.5
Chemicals	120,415.5	8.4	179,607.1	9.8	512,300.2	15.9	487,205.7	13.3	7.8
Plastics	48,320.9	3.4	51,804.5	2.8	78,899.6	2.5	77,957.9	2.1	-0.5
Hides and Leather	21,170.8	1.5	19,672.5	1.1	28,111.5	0.9	31,434.3	0.9	-0.4
Wood and Wood articles	6,160.1	0.4	2,726.6	0.1	2,144.1	0.1	6,412.9	0.2	-2.1
Pulp and paper	5,714.2	0.4	15,267.5	0.8	23,601.0	0.7	22,970.7	0.6	5.6
Textiles and apparel	172,871.1	12.1	199,776.3	10.9	250,522.0	7.8	234,835.5	6.4	0.7
Footwear	5,364.8	0.4	8,462.0	0.5	7,439.9	0.2	5,603.8	0.2	0.8
Stone/Cement/Ceramics	16,291.4	1.1	28,505.6	1.6	26,324.3	0.8	23,112.7	0.6	0.8
Gems	107,562.9	7.5	108,188.1	5.9	278,146.8	8.7	342,656.0	9.3	6.2
Base metal and Metal articles	217,181.3	15.2	279,747.9	15.2	400,550.6	12.5	364,502.5	9.9	2.3
Machinery and Electrical Appliances	211,819.9	14.8	316,803.8	17.2	634,578.8	19.7	1,016,981.7	27.7	7.1
Vehicles	31,977.5	2.2	47,762.1	2.6	55,276.4	1.7	77,746.8	2.1	1.6
Optical, precision & musical instruments	5,371.0	0.4	9,976.8	0.5	20,915.4	0.7	28,203.5	0.8	9.2
Arms	1.2	0.0	8.7	0.0	0.2	0.0	442.7	0.0	8.0
Miscellaneous Manufactured articles	6,569.2	0.5	6,142.2	0.3	9,243.3	0.3	8,173.9	0.2	1.1
Antiques and works of art	7,561.2	0.5	17,300.9	0.9	15,591.0	0.5	19,903.7	0.5	3.4
Other	0.0	0.0	1,105.3	0.1	4,355.2	0.1	2,365.7	0.1	42.9
ALL	1,429,642.8	100.0	1,838,412.7	100.0	3,213,837.4	100.0	3,672,053.2	100.0	

Note: Figures cover only Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand (1993 - 1998)

Figures cover only Brunei Darussalam, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (1999)

Figures cover only Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (2000 - 2001)

Source: ASEAN Statictical Yearbook, 2003

Table 7: Balance of Trade Between ASEAN and India (USD '000)

Product	1993	1995	2000	2001
Live Animal	-43062.2	-107242.3	-214182.8	-217222.1
Vegetable Products	-29336.5	-145109.3	78902.9	65431.9
Fats and Oils	70302.2	500385.3	1051352.9	835502.0
Prepared Foodstuffs	-199116.4	-133771.1	-227016.6	-233731.1
Mineral Products	211063.4	340536.6	929407.3	736386.4
Chemicals	-9365.4	45482.0	30638.1	91997.3
Plastics	13750.4	47877.3	151901.3	117760.2
Hides and Leather	-19921.1	-16740.3	-20541.8	-24026.4
Wood and Wood articles	26488.9	39729.7	218027.0	232099.3
Pulp and paper	17300.4	34529.8	88132.9	123858.6
Textiles and apparel	-141125.1	-120760.4	-49414.4	-14413.8
Footwear	-3799.2	-5541.0	-4382.9	-2229.4
Stone/Cement/Ceramics	945.1	923.8	27249.1	13134.3
Gems	-90369.1	-18607.1	-206779.2	-171684.3
Base metal and Metal articles	113218.7	-97953.2	-136090.0	-73891.5
Machinery and Electrical Appliances	82404.5	465755.8	1351851.9	865887.6
Vehicles	-13579.2	36899.4	75551.6	-3381.8
Optical, precision & musical instruments	27773.5	57199.1	102357.1	107614.9
Arms	-1.2	-8.7	-0.2	-432.3
Miscellaneous Manufactured articles	1218.1	2948.2	13175.8	15901.8
Antiques and works of art	39520.3	57079.8	68765.6	64335.9
Other	0.0	-974.1	12859.3	10023.4
Total	54310.1	982639.3	3341764.931	2538921.049

Source: ASEAN Statictical Yearbook, 2003

Table 8: India's Approved FDI Inflows by Countries, 1996-2001

Country	1996		1997		1998		1999		2000		2001	
	USD mn	%	USD mn	%	USD mn	%	USD mn	%	USD mn	%	USD mn	%
Indonesia	10.58	4.9	2.89	0.3	7.13	1.1	0	0	0.02	0.0	0.01	0.0
Malaysia	11.95	5.6	579.63	70.0	437.01	69.3	26.97	12.2	3.53	4.7	22.42	21.6
Philippines	80.07	37.3	1.35	0.2	0	0.0	0	0.0	0.15	0.2	0.41	0.4
Sinagapore	90.25	42.1	237.37	28.7	185.98	29.5	191.8	86.9	71.93	95.0	80.5	77.7
Thailand	21.6	10.1	7.15	0.9	0.08	0.0	1.63	0.7	0.08	0.1	0.26	0.3
Vietnam	0.01	0.0	0	0.0	0	0.0	0.2	0.1	0	0.0	0	0.0
ASEAN-6	214.46	100.0	828.39	100.0	630.2	100.0	220.6	100	75.71	100.0	103.6	100.0
Total FDI in India	10510.85		15302.86		7800.89		6753.94		8613.83		6249	
Share of ASEAN-6(%)	2.04		5.41		8.08		3.27		0.88		1.66	

Source: Secretariat for Industrial Assistance,SIA Newsletter, January 2003
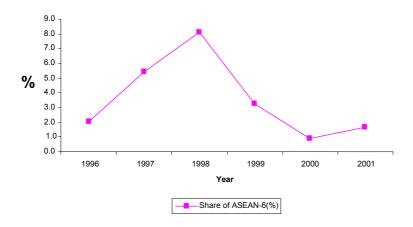
Figure 7: Share of ASEAN-6 in India, 1996-2001 (%)
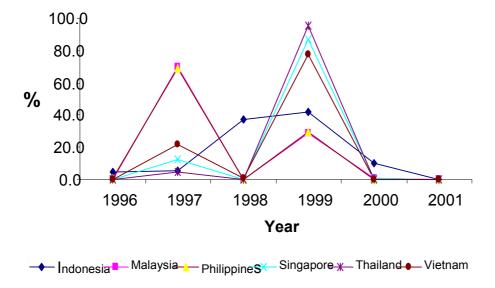
Figure 8: Share of ASEAN-6 FDIs in India by Country, 1996-2002 (%)

Table 9: FDI in ASEAN from India during 1995-2001

	1995	1996	1997	1998	1999	2000	2001	1995-2001
FDI inflows from India (USD mn)	-19.3	40.24	86.18	55.19	16.58	40.27	6.12	225.28
Total FDI Inflows (USD mn)	23,540.09	25,848.10	29,780.44	21,899.25	22,313.33	8,625.29	10,352.17	142,358.67
Share of India in Total Extra ASEAN FDI inflows (%)	0.1	0.18	0.33	0.28	0.08	0.51	0.06	0.18
Share of India in ASEAN's total FDI inflows (%)	0.08	0.16	0.29	0.25	0.07	0.47	0.06	0.16

Source: Computed from ASEAN FDI Statistics Database, 2003

Table 10: ASEAN and India in World Tourism, 2002

Country	Total		Receipt
	No.	%	USD mn
ASEAN	43989101	100	27687.88
Cambodia	786524	1.8	379
Indonesia	4913835	11.2	4305.56
Lao	735662	1.7	113.4
Malaysia	13292010	30.2	6784.5
Myanmar	217212	0.5	99
Philippines	1932677	4.4	1740.06
Singapore	7567110	17.2	5176.47
Thailand	10799067	24.5	7529.89
Vietnam	2627988	6.0	1560
India	2.5mn	-	USD3bn

Source:ASEAN Statistical Yearbook, 2000, 2002

Table 11: Indian Visitors to ASEAN, 1995- 2002

From	1995		1996		1997		1998		1999		2000		2002	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
ASEAN														
Brunei	NA		NA		4152	0.9	4868	1.0	6032	1.1	6237	0.8	NA	NA
Cambodia	1158	0.3	2148	0.5	2000	0.4	1195	0.2	1455	0.3	1767	0.2	2491	0.3
Indonesia	31968	8.1	26947	6.3	26418	5.6	40850	8.1	30081	5.3	34982	4.7	39314	4.5
Lao	11396	2.9	17238	4.0	5866	1.2	8814	1.7	6533	1.1	NA	NA	2319	0.3
Malaysia	27701	7.0	31959	7.4	28948	6.1	33751	6.7	46537	8.1	132127	17.6	183360	20.8
Myanmar	603	0.2	1818	0.4	3302	0.7	4281	0.8	5083	0.9	5605	0.7	5691	0.6
Philippines	12440	3.1	16062	3.7	17711	3.8	20945	4.1	18637	3.3	14938	2.0	14826	1.7
Singapore	188524	47.6	204174	47.5	226612	48.1	243683	48.2	288383	50.5	346356	46.1	375659	42.5
Thailand	123650	31.2	129762	30.2	135121	28.7	147579	29.2	163980	28.7	202868	27.0	253110	28.7
Vietnam	0	0	0	0.0	4188	0.9	0	0.0	4600	0.8	0	0.0	6569	0.7
Total Indian Visitors	396282	100	430108	100	470838	100	505966	100	571321	100	751821	100	883339	100
Total World Visitors	29669071		30932853		31048739		29733004		34215220		39136421		43989010	
% of Indian visitors	1.3		1.4		1.5		1.7		1.7		1.9		2.0	

Source: ASEAN Statistical Yearbook, 2000 and 2002

Table 12: Complementarities and Areas for Mutual Cooperation between ASEAN and India

Country	ASEAN exports to India	ASEAN imports from India	ASEAN investment in India	Indian investment in ASEAN	Areas for mutual cooperation
Indonesia	Vegetable fats and oils, copper ores & concentrates, petroleum products, coal, textile yarn, pulp and paper products	Petroleum products, wheat and meslin, hydrocarbons & derivatives, animal feed, sugar, rice, iron, oil seeds	-	Synthetic fibres, textiles & garments, steel and hand tools, IT education centres,tourism, 2 and 3 wheelers, railway and infrastructures	Oil and gas, manpower and engineering consultancy services for petroleum industry, mining, processing (oil extraction (CPO)), IT education and services, ports and railway, telecommunications, pharmaceuticals and education.
Malaysia	Vegetable oils (edible), electronic goods, wood & wood products, textiles and spun yarn	Sugar, meat preparations, non-basmati rice, cotton yarn, fabrics, wheat	Fuel, power and oil refinery sectors, telecommunications, electrical equipment, photographic raw film & paper and transportation industry. food processing, telecommunications, rubber goods and hotel and tourism.	Palm oil refining, railway, power generation and supply, training, IT	Potential Indian exports to Malaysia: paper & wood products, transport equipment, gems & jewellery, rubber,groundnuts, yarn & fabrics, glassware. Potential Malaysian exports to India: computer hardware and peripherals, consumer electronics and business machines. Areas of synergies: Space technology, biotechnology, pharmaceuticals, bioinformatics, genomics and ayuverda, ICT, development of hardware and software, training centres, telecommunication, infrastructure, food processing, (oil extraction (CPO)), tourism, banking
Philippines	Electronic goods, inorganic chemicals, newsprint, electrical machinery transport equipment	Meat, rice, wheat, yarn, cast iron, electrical & electronic products, drugs and pharmaceuticals & fine chemicals and transport equipment	Telecommunications, reprocessing of waste and human resource management in management education	Textiles, yarn and ICT. IT training centres and schools, waste processing, paging services, power transmission, management of education	Potential sectors for Indian investment in Philippines: textile machinery, drugs & pharmaceuticals, software development & training, steel & metal, manufacturing & design of gold jewellery, engineering consultancy, transport equipment Philippines investment in India: food processing, fashion designing, packaging of products, telecommunications, coconut based products, tourism Areas for mutual cooperation: software development, shared financial services, construction related engineering & design, pharmaceuticals

Country	ASEAN exports to India	ASEAN imports from India	ASEAN investment in India	Indian investment in ASEAN	Areas for mutual cooperation
Thailand	Sugar and sugar confectionary, plastic & plastic products, electric and non-electric machinery, textiles, gems and jewellery	Precious metals & stones, organic chemicals, animal feed stuff, marine products, inorganic/organic/agro chemical, drugs, pharmaceutical & fine chemicals	Fisheries, hotels & tourism, telecommunication Food processing, Chemical (inc.fertiliser) and real estate sectors and electrical equipment	pulp, chemicals, pharmaceuticals, textiles, nylon, tyre cord and real estate.	Potential areas of India-Thai cooperation: tourism, infrastructure –roads, ports, bridges, telecommunication and ICT, biotechnology, pharmaceuticals, education, food products esp. marine products, processed food, financial services, chemicals & pharmaceuticals, transport equipment, garments and special economic zones.
Singapore	petroleum products, electronic valves, telecommunication equipment, electrical machinery, office and data processing machines, metallic ores/scrap, organic chemicals, primary plastics and scientific instruments	textile manufactures including apparel and yarn, precious stones and pearls, parts for office and data machines, aluminium, electrical machinery, fish and fish products and fruits and vegetables.	GLCs: infrastructural development eg. IT park, management of port, real estate, trading telecommunication, financial services, banking GICs: investment in Indian companies	Trading & software, automobile ancillaries, precision tooling, enamelled wires, concentrates for soft drinks, synthetic juice powders, palm kernel processing, micro and mini computers etc	Infrastructure development, critical technologies, tourism, financial services, biotechnology, ICT
Vietnam	Crude oil, pepper, tea, leather and made ups, rubber, artificial resins, silk, paper board & manufactures, wood & wood products, cinnamon, electric components.	Drugs & pharmaceuticals, materials for plastics, seafood, iron & steel, machinery and equipment, chemicals, pesticides	-	Railway, power plants, transmission tower, drugs and pharmaceuticals,	Potential Indian exports to Vietnam: lubricants oil, fertilizers, CKD & IKD motorbikes. Potential Vietnam exports to India: phosphates, furniture, non-ferrous metals, natural tuber, ceramics, handicrafts, semi-precious stones & gems.

The Group Farming Project in Muda Area, Malaysia

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ABSTRACT

The aim of group farming project in Muda Area is to increase the productivity of paddy and through the formation of individual farmers into group farming, the economics of scale will be achieved.   In 5th Malaysia Plan (1986-1990), the enlargement of management scale and group farming project was positively progressed. Each agriculture agency that related to group farming project namely as Kelompok, Mini Estet, Centralized Control Organization, Planter Group Organization, small farmers cooperative and others must set the group farming and its activities as an important target to put in their planning. Muda Agriculture Development Authority (MADA) also took the group farming project as a main focus to extent in Muda Area since 1979. Farmers were calling to participate the group farming because this not only solve the water problem but it can properly transfer the new technologies and know-how in farming management. There are 3 types of group farming in Muda Areas; Kelompok, Mini Estet or Projek Separa Perladangan (PSP) and Estet or Projek Sawah Secara Perladangan (PSSP). Almost 25 years MADA and Pertubuhan Peladang Kawasan (PPK) were involved in group farming project and the Kelompok was shifted from PSP and then PSP shifted to PSSP. In the process of changing the form, the changes of the management and control body arise. It's meaning that through the changing form of group farming, the group management function will gradually shift to MADA/PPK and the function differentiation of the internal group structure occured.

INTRODUCTION

Muda's paddy farming reached their target to increase the production after the technology innovation through basic infrastructure construction, introduction to heavy farming machineries, high breed variety improvement, direct seeding cultivation technics, two seasons planting system made the yield per hectare increase from 2 tone and 3 tone to above 5 tone and also reduced the labor hour from 615 hours to 175 hours through the year 1970 until year 1999. It truly the big success to agricultural extension project after they tried to implement and transfer the new cultivation technics from manual planting to direct seeding technics, two seasons planting system, improvement of seed variety and also group farming project to the Muda's farmer.

The aim of group farming project in Muda Area is to increase the productivity of paddy and through the formation of individual farmers into group farming, the economics of scale will be achieved. But, regarding to Ishida through his study in Muda agriculture extension project, he concluded that there are no policy taking to foster the group farming to become the self reliance group. The group progress relying on the participant members so the farmers should know the reasons why they involve in the group. And what extension agencies should do is to increase the farmer's interest to form the group by themselves so that the group can become as a self reliance group and not dependence to agencies to manage their group[1]. Then Azizan mentioned that the extension strategy nowadays is just focusing to group farming compared to individual farmers and they neglected the farmers' self voluntarism. He suggests that the concentration on development of farmer's

ability must be the first agenda. He also urged that the strategy should be planning to educate the farmers to be a self reliance and good in decision making[2].

This paper tried to examine the group farming project consequences after it was established almost 25 years ago and attempted to find the role of the group farming project and its categorization, organization structure and management style will be clarify.

AGRICULTURAL EXTENSION AGENCIES AND GROUP FARMING

Muda Agriculture Development Authority (MADA) and Pertubuhan Peladang Kawasan (PPK)

The extension bodies that enforcing agricultural extension activities are DOA. But in Muda Area, that role was taken over by Muda Agriculture Development Authority (MADA) as well as Pertubuhan Peladang Kawasan (PPK). MADA playing their roles mainly in the development of paddy farming management by providing the basic land infrastructure, transferring agriculture information and technologies, and controlling and supervising the paddy production activities. It was established in 1970 with the objectives to continuing the hard project in providing irrigation facilities from Department of Irrigation and Drainage (DID) and controlling or managing the irrigation services and facilities. And the other objectives are to promote the development of paddy farming and activate the regional or rural economics. To drive the government policies in agriculture, MADA structured their agency to three sections known as General and Controlling Section, Agriculture Section and Planning and Evolution Section and the section which handling the extension activities in the area is Agriculture Section[3].

MADA was divided to four districts（District I, District II, District III, District Ⅳ）and 27 localities. It accomplishes the roles by doing the planning in irrigation and drainage, transferring the extension of agricultural technologies and information, training the farmers and supervising the group farming. For the PPK which located at 27 localities, it was established in 1970 in objectives to increase the participant member's economies. The main activities of the PPK are buying and selling the agriculture inputs, distributing the subsidized fertilizer, providing the credit service to the farmers and involving in management of group farming. At the localities level, there is one manager and several extension workers and clerical employee reside at each PPK. All the planning of PPK management or activities will be decide by MADA.

The Group Farming Categorization and Agricultural Extension Strategies

One of the objectives in Malaysia Agricultural Policy is to increase the farmer's income whom usually lack with capital power through their participation in the group farming. By the way, the agriculture development strategy was planned in objective to restructure the farming management bodies and it become one of the plan in National Agriculture Policy launched in 1984. In 5th Malaysia Plan (1986-1990), the enlargement of management scale and group farming project was positively progressed. Each agency that related to forming the group farming project namely as Kelompok, Mini Estet, Centralized Control Organization, Planter Group Organization, small farmers cooperative and others must set the group farming and its activities as important target to put in their planning[4]. MADA also took the group farming project as a main focus to extent in Muda Area. The focus of this extension strategy is the project that can increase the extension results and can unify the supervision and consultation of extension agencies and the project target was not the individual farmers but the farmers in the group[5]. By the way, MADA was took this extension strategy and at the present, the formation of farmers in group farming that responding to area's agriculture condition and needs was advancing at Muda Area.

There are three types of the group farming at Muda Areas which named as Kelompok Tani, Mini Estate and Estate. Table 1 showed the group farming objectives, participation rules, characteristics, steps or procedures and its targets or aims.

Kelompok Tani

Kelompok Tani is the group of paddy farming activities and it was formed by farmers whom cultivating the land by next to others. This kind of group farming was arranged to meet the extension needs and was fostered to be a tip organization or group that receive the new technologies and know-how to improve the farmer's management[6]. One group consists 20 until 60 farmers and will be manage by committee members selected among the participants. The main activities in Kelompok Tani are arrangement of the planting schedule to make sure all the farmers in the group will do the activities in the same time or sometimes arrangement of the negotiation between combine harvester contractors. The Kelompok members will follow the planting schedule as fixed to them and they will get the profit from their own land without sharing with other members.

Kelompok Tani was introduced by PPK in 1979 to make an arrangement in planting schedule, but before the project starting, the rules of participation were determined, 1) The participant members are in the same block, 2) They are the members of PPK, 3) Participant member agreed after attended the explanation meeting[7]. Before the farmers participating in group farming, most of them facing the problems in planning their harvesting schedules because each farmer in the same block has difference planting schedules. In Muda Areas the infrastructure and irrigation facilities project was done in between 1960 until 1970 but there is some water irrigation problem left. That found that although some of the fields are in the same block but the harvesting schedule or period was difference depending on water distribution conditions. To solve the problems, MADA supervised the agriculture extension agents to arrange the planting period due to water distribution schedule. Farmers were calling to participate the group farming because this not only solve their water problem but it can transfer the new technologies and know-how in farming management properly. This group farming becomes the one of important points in extension tasks in Muda Area.

There are two Kelompok Tani established in 1979 but it was increase to 308 in 1990, but decrease to 133 in year 2000. There are some reasons; those are because the Kelompok was shifted to Mini Estet (PSP) or the Kelompok Tani itself not active anymore. The Kelompok Tani was managed by selected committee members and PPK is as the group supervisor. The organization structure of Kelompok Tani showed in Figure 1. MADA tried to solve the planting, harvesting and water schedule problem with promoting the group farming but the cooperation received from farmer is not good enough. There some farmers cannot follow the planting or harvesting planning so the objective of forming the Kelompok cannot achieve as targeted.

How the farmers thinking about the Kelompok are as follows, 1) the objective of their participation in Kelompok is to increase the income so they decide to participate in the group, 2) their freedom in the farming management will be prevent if they are participate in the group. That mean, the first thinking is they are hoping that by participating in group farming, their income can increase and latter is they are denied to participate in group farming, By the way, PPK moved their strategy to shift the Kelompok management style to Mini Estet management in objective to solve inner problem in Kelompok and try to get the rationalization in farming management
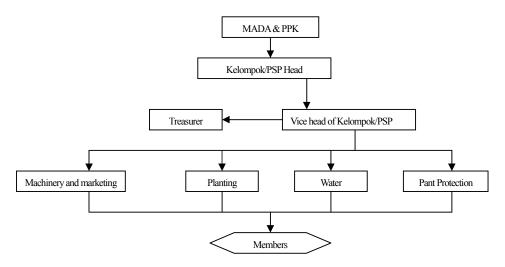
Mini Estet (ME) or Projek Separa Perladangan （PSP）

The difference point between Kelompok and PSP is due to the exist of the agreement between the participant members and PPK. PPK will provide the management capital to PSP and PPK will do the management of that capital, office clerical control and do the decision making on PSP management. PSP are the Kelompok which shifted the form to a new form and was established in 1989 in objective to give better management solution to the farmers. The standard to shift the Kelompok to PSP are determine by the member's cooperation condition and the good result in group management. PSP can be

establishing if all of the Kelompok members are agreed to do that. PSP provide the members with the loan credit as an incentive o them. And PPK will do the harvested paddy selling on behalf of the members. For those members whom make the loan credit, PPK will cut the proceeds for the repayment before pass the balance of the proceeds to the members. The reasons why the PPK did the sale are to make sure the evaluation or the examination of the selling activities and implementation easily to carry out. The organization chart of PSP was shown in Figure 1.

   Lets see how the farmers thinking about PSP. It divides to three, 1) Some farmers thinking that PSP is the new good way to improve their management practice and increase their income, 2) Some farmers worried about the agreement contents and they want to remain in Kelompok, 3) Some farmers feel the the merits are small to continue stay in group and they decided to secede from the Kelompok.

Figure 1:Kelompok and PSP Organization Chart

Note : draw up from the field survey

PPK and MADA tried many ways to make the management of the group efficient, but some of the members are not followed the rules well so it's give an obstacles to achieve the targets to increase the revenue. By the way, PPK and MADA changed their strategies by shifted the PSP to Estet or Projek Sawah Secara Perladangan (PSSP) to achieve the targets to increase the farmer's revenue through the management efficiency.

Table 1: The Objectives, Characteristics, Participation Rules and Goals of Kelompok, PSP and PSSP

G. Farming		The Objective	Participation Rules, Characteristics, Procedures and Goals
Kelompok	①	The efficiency of farming practice	・Characteristics:
	②	Increase yield, increase farmers income	① Group activities planning and it implementation will be doing by farmers and committees
	③	The best way to transfer the technologies and supervise the management	② Planting schedule, product selling will be doing by farmers ・Rules: The land must be in the same irrigation block ・Procedures/means: Arrangement of planting schedule and water control ・Targets/Goals: The strengthen of cooperation between farmers and consolidation of farming practice
PSP	①	Management rationalization	・Characteristics: ① PPK will make contract agreement with farmer ② Clerical control and capital control will be done by PPK and committees ③ The group excess will be distribute to PPK（30%）, Committee (40%), PSP Foundation (30%) ・Rules: ① The members must follow the planting schedule as planned by committee and must use the machine posses of the contractor and selling the product to the rice miller as fixed for them ② Rules: Use the same variety of seed and buy the inputs from the PPK ③ PPK will control the products selling and cut the proceeds for the loan repayment ・Procedures/means: Group renting for harvester machine and group selling will cut the production cost ・Targets/Goals: ① The cooperation between farmers and agriculture agencies will be strength ② PPK will easily supervise the group activities examination and evaluation
PSSP	①	Get Solution of PSP internal problem and arrangement	・ Characteristics: ① PPK will make the contract agreement with the farmers ② PPK will doing the process from the land preparation until the products selling
	②	Management rationalization	③ The profit will be given to farmer by form bonus depend on farmers land areas ④ The group excess will be distribute to PPK（30%）, Committee (40%), PSP Foundation (30%0 and bonus (10%） ・ Rules: ① Farmers will give pass all of their production activities to PPK ② 10% of PSSP foundation will be given to PPK ・ Procedures/means: PPK will be doing management control ・Targets/Goals: 10 tone per ha of yield

Note：draw up from the field survey

Estet or Projek Sawah Secara Perladangan (PSSP)

MADA established PSSP in objective to progress the management of PSP to more efficiently with the target to achieve 10 tones per hectares for its area. MADA handling all of the management of PSSP in target to increase the management efficiency and now there are 40 projects of PSSP at Muda Areas.

The difference between PSSP and Kelompok and PSP is MADA/PPK handling all the management of the group. In case of PSSP, the manager is MADA/PPK and the farmers becomes as the committee members or field workers. MADA/PPK

progress their strategy to establish more PSSP because they think it will bring some merits to farmers, PPK, contractors also government agencies. This merits showed in Table 2 and the organization chart of PSSP showed in Figure 2. Some of the farmers have opposite opinion regarding PSSP and they refuse to join in the group. There are two reasons, 1) Their management function will move to MADA/PPK when the group changing its form to PSSP, 2) The land owner will participate into group caused the tenants cannot maintain their business anymore.

Figure 2: PSSP Organization Chart

Note : draw up from the field survey

To establish the PSSP, MADA arranged the Confirmation of district, scale of area, participation members.   Explanation session, mutual consent formation, agreement with farmers, registration or members and records books making, Registration of the farmers who want to be field workers, The order of cultivating, harvesting and transporting ordering Making of working schedule, job description planning, the production cost, Application to bank, Selection on rice miller and the selling price, Project data recording and report writing, The payment to participation members, input suppliers, harvester machine contractors, rice miller, Project capital and others.

Table 2 : The Way of MADA, PPK, Farmers and others thinking about the Merits of PSSP Projects

Receiver bodies	Members		PPK		Contractors, Miller and Transporters		Government Agencies	
MADA	①	The rationalization of management can be achieve through the proper working planning and management controlling	①	The members number will increase and the reliance toward PPK will increase too	①	The payment of contracting will be guaranties because the PPK doing the product selling activities	①	PPK will controlling the project capital so the repayment to agencies likes Bank Pertanian will be guarantying
	②	Agriculture input buying price will be guarantying because the PPK will provide it directly	②	PPK will get the benefit form the selling of inputs, commission and products selling	②	The fix ordering of machinery service will be guarantied		
	③	Life insurance, Plant insurance, annual bonus will be provide to farmers						
Farmer, Contractors, Miller and Transporters	①	The farmers will lost their management function	①	Probably PPK will short enough of the project management and controlling budget	①	The competition between the contractors will arise because PPK sign the contract agreement with not more than two contractor only		
	②	The supplier inputs price cheaper then PPK price						
	③	Problem between land owner and tenant will arise according to the PSSP participation rules	②	Probably the bank interest will increase				

Note：draw up from the field survey

THE RESULTS OF GROUP FARMING IMPLEMENTATION AND FUTURE ISSUES

Almost 25 years MADA and PPK were involved in group farming projects and the Kelompok was shifted from PSP and then PSP shifted to PSSP. By the way, in the process of changing the form, what are the results can be obtained, what are the issues still around?

The Changes of The Management and Control Body

Through the preparation of basic land infrastructure, introduction of direct seeding technics and introduction of heavy machinery, Muda Area paddy farming was rapidly changed. To solve the problem of farmer's difference planting schedules and water distrubiton problem, the cooperation needs from the farmers to merge their schedule accurately. In this case group farming was playing its main roles. But the strategies to spread the implementation of group farming to all area in Muda are not yet achieving the target. The participation in Kelompok and PSP rate are only at 22%. May be many farmers are not certified the merits of group farming and refuse to participate in group style management. They can still manage their farms properly by following the water distribution schedule and arrange their planting schedule without involve themselves in the group. In the process of group farming form changing, the changes of the management and control body was arose. The Table 3 showed what occured to participation member's management and control between the changes form from the Kelompok to PSSP.

Table 3: The Changes of Management and Control Body Through the Changing of Group Farming Form

	Management Function	Kelompok	PSP	PSSP
1.	Planting schedule arrangement and planning	Members	Committee &PPK	Committee &PPK
2.	Products selling	Members	Committee &PPK	Committee &PPK
3.	Negotiation and selection of harvester contractor	Members	Committee &PPK	Committee &PPK
4.	Agriculture inputs usage and buying	Members	Committee &PPK	Committee &PPK
5.	Farm level water controlling	Members	Members	Committee &PPK

Note : draw up from the field survey

In the Kelompok, the process of production until selling the product will be doing by farmers. But after Kelompok shifted to PSP, that function will be doing by PPK and MADA except the field level water controlling. To get the rationalization of management, MADA/PPK who posses and provide the capital power and the knowledge and information regarding the farming technologies are found more advantage compared to the farmers to handling the management of PSP. PPK also control the clerical work and financing. Some of the farmers worried about the function of MADA/PPK in the management of PSP. They thought their management freedom probably will be limited if they participate in PSP. This reason becomes one of the reasons why participated members seceded from group and return to be individual farmer.

From the Kelompok to PSP, the committee members of the group still remain the same, but after it shifted to PSSP, the committee becomes assistants to MADA/PPK. The participation members will work as field worker or laborer. As shown at Figure 2 and 3, MADA/PPK is the supervisor but after shifted to PSSP they will become as manager who holding the management function of the group. It's meaning that through the changing form of group farming, the group management function will gradually move to MADA/PPK and the function differentiation of the internal group structure will occured.

The participation rate of farmers in the Kelompok is 14% in 2000 compared to 17% in 1992 and PSP participation rate is 7.8% in 2000 compared to 4.8% in 1992. Participation rate in Kelompok decreased because some of the Kelompok shifted to PSP or whether some of the Kelompok seceded because of the activities of the Kelompok was stopped. Figure 3, 4, 5, 6 and 7, showed the numbers of Kelompok and PSP, areas, numbers of members, and average of yield and Table 8 showed the numbers of PSSP, areas, numbers of members, and average of yield.

The Land Ownership and Changing of the Land Usage

In the PSSP, all function of farming management will be handling by MADA/PPK so that the farmers just receive the returns only. Then the land owner who is not a farmer also can participate in the group. Until now, the land owner just rent their land to the tenants but after they can participate in the group, probably they will stop the contract with the tenants. For this kind of reasons, the tenant cannot do their business and probably will lose their job. To handle it, MADA/PPK has the planning to take the tenants as their PSSP laborer.

Table 3: Numbers of Kelompok and PSP, Areas, No. of   Members and Others (1979～1983)

Unit: ha, man, tone/ha

Year	1979		1980		1981		1982		1983	
Seasons	I	II	I	II	I	II	I	II	I	II
Kelompok:										
No. of group	2	4	8	8	18	20	49	54	65	74
Area	49.6	94.4	310.9	319.9	772.34	914.8	2597.1	3121.1	3751.8	4127.2
No. of members	41	72	195	195	598	700	2079	2538	3014	3308
Average of yield	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
PSP:										
No. of group	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Area	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
No. of members	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Average of yield	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A

Source: MADA；NA＝Not Available

Table 4: Numbers of Kelompok and PSP, Areas, No. of Members and Others (1984～1988)

Unit: ha, man, tone/ha

Year	1984		1985		1986		1987		1988	
Seasons	I	II	I	II	I	II	I	II	I	II
Kelompok:										
No. of group	90	96	116	129	157	166	171	188	214	217
Area	5047.4	5280.9	6417.2	7099.6	8922.5	9813.3	11507.0	10946.2	13362.3	12611.5
No. of members	4097	4336	5265	5773	6678	6927	7048	7670	8940	8290
Average of yield	N.A	N.A	N.A	N.A	N.A	N.A	N.A	4.5	4.4	6.0
PSP:										
No. of group	N.A	N.A	N.A	N.A	N.A	3	8	9	16	25
Area	N.A	N.A	N.A	N.A	N.A	94.8	346.8	395.9	926.1	1544..2
No. of members	N.A	N.A	N.A	N.A	N.A	95	370	407	743	1122
Average of yield	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	4.3

Source: MADA; NA＝Not Available

Table 5: Numbers of Kelompok and PSP, Areas, No. of   Members and Others (1989～1993)

Unit: ha, man, tone/ha

Year	1989		1990		1991		1992		1993	
Seasons	I	II	I	II	I	II	I	II	I	II
Kelompok:										
No. of group	273	283	276	308	313	295	298	275	287	285
Area	12808.1	14054.2	13894.3	13641.6	14169.6	13720.2	14139.9	13720.2	13702.5	13738.2
No. of members	10213	10324	10021	10960	11183	10641	11116	10698	10878	10935
Average of yield	5.2	5.5	5.7	5.4	4.2	5.5	4.6	5.5	5.0	5.5
PSP:										
No. of group	29	35	51	61	69	79	89	94	100	106
Area	1713.0	1874.2	2595.3	2965.3	3552.1	3870.5	44496.0	4565.4	4999.2	5313.7
No. of members	1150	1317	1887	2094	2345	2555	3054	3150	3443	3578
Average of yield	4.4	6.0	5.3	5.4	5.5	5.5	4.5	5.5	4.6	5.5

Source: MADA

Table 6:Numbers of Kelompok and PSP, Areas, No. of Members and Others (1994～1998)

Unit: ha, man, tone/ha

Year	1994		1995		1996		1997		1998	
Seasons	I	II	I	II	I	II	I	II	I	II
Kelompok:	273	283	276	308	313	295	298	275	287	285
No. of group	12808.1	14054.2	13894.3	13641.6	14169.6	13720..2	14139.9	13720.2	13702.5	13738.2
Area	10213	10324	10021	10960	11183	10641	11116	10698	10878	10935
No. of members	50	5.7	5.0	5.3	4.7	5.0	4.2	5.1	4.2	5.1
Average of yield										
PSP:										
No. of group	117	120	129	134	138	142	147	150	151	155
Area	5340.4	5558.9	6043.7	6246.4	6740.6	7362.0	6455.7	6898.3	6938.0	7.53.2
No. of members	3909	4062	4382	4464	4555	4634	4734	4802	4815	4919
Average of yield	4.6	5.5	5.0	5.7	5.1	5.3	4.9	5.2	4.8	5.1

Source: MADA

Table 7:Numbers of Kelompok and PSP, Areas, No. of Members and Others (1999〜2003)

Unit: ha, man, tone/ha

Year	1999		2000		2001		2002		2003	
Seasons	I	II	I	II	I	II	I	II	I	II
Kelompok:										
No. of group	230	227	226	226	226	226	131	165	132	133
Area	11556.9	11555.5	11476.1	1476.07	11067.3	11476.1	6490.22	8605.99	7331.72	7327.87
No. of members	6742.8	6604.3	7936.7	8765	8566	8765	5367	6859	5814	58434
Average of yield	4.9	4.8	4.9	4.89	5.3	4.89	5.50	5.38	5.62	5.52
PSP:										
No. of group	156	155	158	161	148	161	153	141	144	143
Area	6742.8	6604.3	7936.7	7394.99	6412.53	7394.99	6875.41	5830.89	5721.73	5694.11
No. of members	4980	4836	4951	5058	4684	5058	4916	4081	4019	3976
Average of yield	5.3	4.9	5.3	5.05	5.6	5.05	5.67	5.51	5.84	5.48

Table 8: Numbers of PSSP, Areas, No. of Members and Others (1999〜2003)

Unit: ha, man, tone/ha

Year	1999		2000		2001		2002		2003	
Seasons	I	II	I	II	I	II	I	II	I	II
PSSP:										
No. of group	2	5	7	3	3	3	6	27	31	34
Area	283.2	183.66	298.83	164	133.62	133.62	170.6	1534.76	1853.67	1941.82
No. of members	118	153	223	137	107	107	144	1165	1381	1445
Average of yield	4.8	5.0	4.8	5.2	5.6	5.6	5.95	5.46	6.03	5.74

Source: MADA

THE MAIN ISSUES IN AGRICULTURE EXTENSION PROJECT REGARDING THE GROUP FARMING

As mentioned above, Malaysian extension strategy focused on the project that can increase the extension results and can unify the supervision and consultation of extension agencies and the project target was not the individual farmers but the farmers in the group. Along this strategy, MADA took this extension project as their main project and make the project of group farming as the objects. Regarding this matter, the new issues arise that are 1) the farmer's desire toward the management will decrease due to their management function was moved to MADA/PPK after they joined into the group and it will promote the "labourism" in agriculture engager, 2) The major work as cultivating, harvesting, milling are entrust to external bodies so it not help to increasing the farmers income and it will decrease farmer's initiatives to improve their management. Its meaning that, the main issues of extension project now is how they will solve the problems as mentioned above. The extension strategies should be rechecking again and the qualification and the ability of supervision of the extension worker must be increase too. Especially, the agriculture extension workers should know what the farmer's management goal and their strategies planning. And they should suggest the rational decision making material to assist the farmers to make their decision regarding their business. For those reason, it is important to give more training, course and

others to train our extension worker to be a good consultant and supervisor to the farmers.

CONCLUSION

After determined the results and problems of the paddy group farming in Muda Area, below is the main point of the findings.

（1） The strategy of MADA/PPK is to spreading the farming technologies through the establishment of group farming and increase the paddy productivity of Muda Area. And it target to foster the manager of paddy farming including the rationalization of management to decrease the production cost.

（2） The group farming was changed to several forms as Kelompok to PSP and PSP to PSSP but the farmer's participation rate just on 22%. The reasons are the farmer not certified the group farming merits itself. Especially their management function will move to MADA/PPK if their group changed form to PSP or PSSP. It also loses the individual farmers incentives toward innovation of management.

（3） Among the individual farmers, there are many successors arising and they have many thinking way or strategies in their management. It means that the extension project must have the flexible extension activities that will suit to the farmer's goal, their production essentials and their management and controlling way that can help the farmers to be progressive.

REFERENCES

Ishida Akira, Azizan Asmuni, The Malaysian Rice Policy Direction and Issues—7th Malaysia Plan—, Nougyou Sougokenkyu, Volume 50 No. 4, 1996

Azizan Asmuni, Fujio Kumori, 1980's Malaysian Agriculture Extension Project Development and Future Issues, Nougyou Keizai Kenkyu, Volume 56 No.4, 1993

Muda Agriculture Development Authorities (MADA)

Azizan Asmuni、Fujio Kumori 2)

As above

Kumi Yasunobu, The Direct Seeding Technics in Muda Irrigated Paddy Farming Area, Nougyou Gijutsu, Volume 52, No. 12, 1997

As above

MADA

Demand for Rice in Malaysian: Aids Model Versus Aids-ECM Model

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ABSTRACT
Using annual data for the period 1961-2003, an econometric approach, mainly the Almost Ideal Demand System (AIDS) and Almost Ideal Demand System in the error correction model (AIDS-ECM), was employed in this study. This paper compare the demand for rice in Malaysia using both model- the Almost Ideal Demand System (AIDS) and Almost Ideal Demand System in the error correction model (AIDS-ECM). The results suggest that both model resulted in the same conclusion in term of the commodity status in the Malaysian demand pattern. However, the AIDS-ECM model gave a fairly robust in term of the goodness of fit of the model compare with the previous model. The results have supported the evidence that rice is an inferior good in Malaysia, and wheat and others cereal are normal good. Rice consumers do not respond to changes in the price of as much as they do to changes in the price of wheat and other cereals, indicating that demand for rice is less price sensitive than that of demand for wheat and other cereals. In term of cross price elasticity, the results show that rice and wheat is substituting each other, whereas rice and other cereals are complement each other.

INTRODUCTION

Malaysia's domestic rice production accounted for about 77% of the total domestic consumption. Although per capita consumption of rice is anticipated to decline from 85.7 Kg in 2000 to 82.8 Kg in 2005 and 80.4 Kg in 2010, the demand for rice in the domestic market is projected to increase from 1.8 million tones in 1995 to 2.3 million tons in 2010 due to population increase. Every year Malaysian consumes on average about 1.8 million metric tonne of rice. Their per capita consumption is 81 kilograms per annum. Local production can only cater approximately 60 – 65% of domestic requirements.

There is no denying the negative correlation between rice consumption and the rapid increase in Malaysia's disposable income that occurred during the last three decade. The question raised here is whether this correlation also implies causality, so that projected future increases in income are a good indicator of future shifts in demand. That is, as Malaysia's incomes continue to increase, will Malaysia rice consumption continue to decline and so on before levelling off. Beside income and price changes, urbanization, market development, changing lifestyle and occupations are often found to contribute to rice consumption pattern changes (Bouis, 1991; Huang and David, 1993; Huang and Rozelle, 1998; Sahn and Alderman, 1998).

A number of studies have been carried out to analyse the demand for rice in Malaysia such as Ahmad (1980), Baharumshah (1993), Ishida (1995), and Nik Faud (1993). Most of them utilised the Almost Ideal Demand System Model (AIDS model). These studies however, did not address the stationarity problem of time series data which might render the resulting regression coefficients as spurious. According to Engle and Granger (1987) if non-stationary time series variables are not co-integrated, then they have no long-term relationship. Co-integration, introduced by Granger (1981), is relevant to the problem of the determination of long-run or 'equilibrium' relationships in economics. The basic idea behind co-integration is that if, in the long run, two or more series move closely together, even though the series themselves are trended, the difference between them is constant. It is possible to regard these series as defining a long-run equilibrium relationship, as the difference between them is stationary (Hall and Henry, 1989). A lack of co-integration suggests that such variables have no long-run relationship, in principle they can wander arbitrarily far away from each other (Dickey, 1991). Existence of a high degree of correlation between two variables does not mean there is a causal relationship between the variables. For example, a high R may only indicate correlated trends and it is not the implication of a real economic relationship. To remedy this problem, the co-integration technique and error correction modeling are recommended (Bahmani-Oskooee and Alse, 1993). Some recent studies have confirmed the existence of a co-integrating long- run relationship in the demand system, such as Kaabia and Gil (2001), NG, S. (1995).

This study however compares the properties of demand system (i.e. AIDS) estimating and the properties of time series on the AIDS in an error correction model (AIDS-ECM). The former model reflected its properties in term of first, the functional form is general, second the system is linear in the parameters and hence simple to

estimate, third this model is the most satisfactory in terms of being able to test the restrictions of adding up, homogeneity, and symmetry through linear restrictions on fixed parameters. However, the late model of this study attempted to capture the relevant issues that are the time series analysis on the one hand and demand system model on the other hand. Here the process followed was to test the data of stationary and since the result found that all the data was not stationary, then the author went on to the co-integration test where the results found that the data in the equation were co-integrated which implies there is long run relationship between the variable. Consequently, the author continues with the error correction model in the Almost Ideal Demand System (AIDS-ECM). This was the main purpose of the AIDS-ECM model to obtain not only the properties resulted from applying the AIDS model but also to obtain un spurious regression coefficients. Hence, the general objective of this study is to analyse and estimate of Rice Consumption in Malaysian using two different approaches of aggregate demand systems.

METHODOLOGY

Model Specification

This study analyzes the rice demand in Malaysia. Both AIDS and AIDS-ECM Model and Cointegration Implications were employed. The (AIDS) Almost Ideal Demand System is derived from the static theory of optimizing household behaviour (Deaton and Muelbauer, 1980). Households are assumed to have fundamentally similar preferences and choose their optimal bundle of homogeneous goods at one point in time, given perfect information. The estimation of the Almost Ideal (AI) model to available time series data is the application of a static model (using a flexible but nevertheless restrictive functional form) to what must be assumed to be an evolution of the collective, dynamic, optimizing behaviour of non-homogeneous households, making decisions based on partial information.

The estimation of the AI model and other models of a similar 'duality' in nature (Antle and Capalbo, 1988), using time series data, has been increasingly popular. Considerable energy has been devoted to the analysis of the appropriateness of the functional forms and their ability to approximate the behaviour of 'rational' agents (Christensen et al., 1975; Lau, 1986) and to allow aggregation across consumer groups. The theory of estimation and inference has, for the most part, been confined to the issue of whether to use maximum likelihood (ML) in the estimation of the AI model or to use the Seemingly
Unrelated Regression (SUR) method applied to linear approximations of the AI model. In either case the underlying 'static' assumptions such as homogeneity and symmetry have been tested using the classical rules of inference under the implicit assumption that the regressors are stationary and ergodic processes (Hamilton, 1994, pp. 45-46). Alston and Chalfant (1993) indicated that, in a comparatively short time since the AIDS was introduced, it has been widely adopted by agricultural economists, to the point that it now appears to be the most popular of all demand systems. In the year following the statement by Alston and Chalfant, Buse (1994) supported their statement by saying that the model of Deaton and Meulbauer had become the model of choice for many applied demand analysts. According to Deaton and Meulbauer (1980), Alston and Chalfant (1993) and Eales and Unnevehr (1994) the popularity of the AIDS can be ascribed to several reasons:
1. It is as flexible as other locally flexible functional forms but it has the added advantage of being compatible with aggregation over consumers. It can thus be interpreted in terms of economic models of consumer behavior when estimated with aggregated (macroeconomic) or disaggregated (household survey) data (Glewwe, 2001).
2. It is derived from a specific cost function and therefore corresponds with a well-defined preference structure, which is convenient for welfare analysis.
3. Homogeneity and symmetry restrictions depend only on the estimated parameters and are therefore easily tested and/or imposed.
4. The Linear Approximate version of the AIDS (LA/AIDS) is relatively easy to estimate and interpret.
5. The AIDS gives an arbitrary first-order approximation to any demand system.
6. It satisfies the axioms of choice exactly.
7. It aggregates perfectly across consumers without invoking parallel linear Engel curves.
8. It has a functional form which is consistent with known household-budget data.

Some of the other demand systems possess many of these desirable properties, but non possesses all of them simultaneously, this popularity where the name *"Almost Ideal"* originates. The specification of the AIDS, the linearization therefore, the theoretical demand restrictions to be tested and imposed as well as the empirical application on the Malaysian rice, wheat and other cereals data.

Linearizing the AIDS

As explained above, the only difference between the AIDS and its linear version, the LA/AIDS, lies in the specification of the price index. Several authors including Green and Alston (1990); Pashardes (1993); Alston *et al.,* (1994); Buse (1994); Hahn (1994); Moschini , Moro and Green (1994); Moschini (1995); Asche and Wessels (1997) have discussed the relationship between the linear and nonlinear specifications. In several of these studies, Monte Carlo studies were used to show that the use of differential functional forms of the index in the LA/AIDS provides results that compare more or less well to the AIDS model, (Asche and Wessels, 1997).

It has features of both the Rotterdam and Translog models. The *P* term makes AIDS a nonlinear model; however, in the literature, empiricists have often used a linear approximation for *P*. The Stone's price index, as suggested by Deaton and Meulbauer (1980), which can be used to replace the translog price index, is defined as follows:

$$\log p_t^* = \sum_{j=1}^{N} w_{jt} \log p_{jt} \tag{1}$$

Eales and Unnevehr (1988) showed that the substitution of the Stone's price index for the translog price index causes a simultaneity problem, because the dependent variable (w_{it}), also appears on the right hand side of the LA/AIDS. They suggested using the lagged share ($w_i, t-1$) for equation 1. Replacement of equation with the lagged shares, into equation (1) yields the LA/AIDS, given by:

$$w_{it} = a_i + \sum_{j}^{n} \gamma_{ij} \ln p_{jt} + \beta_i \ln(X/P)$$

$$w_{it} = a_i + \sum_{j}^{n} \gamma_{ij} \ln p_{jt} + \beta_i (\ln X - \sum_{i=1}^{n} w_{i,t-1} \ln p_{i,t}) + u_{i,t} \tag{2}$$

Theoretical demand restrictions, which can be tested and imposed on the LA/AIDS, includes adding-up, homogeneity and symmetry. These restrictions can be written mathematically as follows:

The adding-up constraints are $\sum_{i=1}^{N} a_i = 1$, $\sum_{i=1}^{N} b_i = 0$, and $\sum_{i=1}^{N} c_{ij} = 0$. These are used for estimation and not for testing. The homogeneity and symmetry constraints are $\sum_{i=1}^{N} c_{ij} = 0$ and $c_{ij} = c_{ji}$, respectively.

In addition to the Stone's price index, three other price indices, which can also be used to replace the translog price index, have been suggested by Asche and Wessels (1997). Among them are:

Tornqvist index: $Lnp_i = \frac{1}{2} \sum_{t=1}^{n} (w_{it} + w_t^0) \ln(\frac{p_{it}}{p_t^0})$ (3)

Paasche Index: $Lnp_t = \sum_{t=1}^{n} w_{it} \ln(\frac{p_{it}}{p_t^0})$ (4)

Laspeyre Index: $Lnp_t = \frac{1}{2} \sum_{t=1}^{n} w_t^0 \ln(\frac{p_{it}}{p_t^0})$ (5)

Expenditure and price elasticities can then be derived easily:

$$\eta_i = 1 + (\beta_i / w_i) \tag{6}$$
$$\varepsilon_{ii} = -1 + (\gamma_{ii}/w_i) - \beta_i \tag{7}$$
$$\varepsilon_{ij} = (\gamma_{ii}/w_i) - \beta_i w_j / w_i \tag{8}$$

Where η_i is the expenditure elasticity, *wi* is the budget share of good *i*, ε_{ij} is the own price elasticity, and ε_{ij} represents the cross price elasticity, in Marshallian terms, uncompensated. Compensated, Hicksian, price elasticities, *eij*, can be derived easily by using η_i, ε_{ij} and ε_{ij} and the following relation:
$$e_{ij} = \varepsilon_{ij} + \eta_i * w_i \tag{9}$$

To be able to obtain these elasticity estimates, we need time series data on prices.

Price and Expenditure Elasticities.

Compensated and uncompensated elasticities were calculated. The formulas as reported by Jung (2000) were used to calculate the compensated and uncompensated price elasticities, shown in equation 7 and 8 respectively:

$$e_{ij}^* = e_{it} + \overline{w} + \hat{\beta}(\frac{\overline{w}_j}{\overline{w}_t}) = -\delta + \frac{\hat{\gamma}_{it}}{\overline{w}_t} + \overline{w}_j \quad \text{I,j=1,2,......n} \tag{10}$$

$$e_{i,t} = -\delta + \frac{\hat{\gamma}_{it}}{\overline{w}_t} - \hat{\beta}(\frac{\overline{w}_j}{\overline{w}_t}) \tag{11}$$

where δ=1 for $i=j$ and δ=0 otherwise. The average expenditure shares are represented by $\overline{w}_t$ whereas $\hat{\beta}_t$ and $\hat{\gamma}_{it}$ are RSUR parameter estimates for the LA/AIDS model. The variances of the compensated and uncompensated price elasticities can be calculated by applying the variance operator for the compensated and uncompensated price elasticities respectively as shown eqs: 7 and 8. The formula, taken from Jung (2000) for the expenditure elasticity can be written as:

$$\eta_t = 1 + \frac{\hat{\beta}_t}{w_t} \tag{12}$$

The variance of the expenditure elasticity can be calculated as same as equation (2).

AIDS-ECM MODEL AND COINTEGRATION IMPLICATIONS

If the series in model (2) are non-stationary and cointegrated then the system reveals a long run utility-maximizing consumption pattern. However, the application of OLS to the system (2) results in parameter estimates that are super-consistent but have non-standard distributions, as tests based on standard asymptotic results will have the wrong size. Alternative techniques for estimation and inference in the case of long-run equilibrium relationships have been developed (see, e.g. Johansen 1988;Phillips and Hansen, 1990; Johansen and Juselius, 1992;Stock and Watson, 1993). However, the cointegration approach has been applied to demand analysis only recently. Ng(1995) and Attfield (1997) specified a system of variables in triangular form, estimating the system using dynamic OLS (Stock and Watson,1993) and testing homogeneity with a Wald statistic. Balcome and Davis (1996) used canonical cointegration regression (CCR) (Park,1992) to estimate an AID system for food consumption in Bulgaria. In all these papers, no attempt was made to identify the cointegration relationships. It was assumed a prior that among the (2n+1) variable (n budget shares, n prices and real expenditure) where n-1 cointegrating vectors each of which corresponds exactly to an equation of the system. Recently, Pesaran and Shin (1999) estimated a cointegrated AID model using the Johansen procedure. They found exactly n-1 cointegrated relationships among the variable. They concluded both the exact identification restriction (on budget share variables) and the over-identification restriction (homogeneity and symmetry) on the cointegrating vectors so as to specify a long-run AID model compatible with economic theory. However, it is possible that the number of cointegrating vectors exceeds n-1. in this case other alternative may exist.

The time-series properties of data used should be investigated before specifying the appropriate dynamic form of Eq. (10) assessing formally the existence of long-run relationships. The number of unit roots should be identified for each individual time-series (i.e. the order of integration) using either the Dickey–Fuller, the augmented Dicker–Fuller, the Philips–Perron, or the Johansen test. For the purpose of the present study a series of the first three tests is carried out.

Depending upon the order of integration of relevant series, there are three alternatives. First, if S_i and the vector of explanatory variables (prices and total food expenditure) are integrated of the same order, cointegration can be established for all budget share equations and each one consists of a cointegrated regression equation that can be written in an error correction model (ECM) form. Second, it is also possible to have a cointegrated regression equation even though the variables of interest have different time series properties and thus, a different order of integration. According to the Granger representation theorem, a linear combination of series with different order of integration may consist of a cointegrated regression. This linear relationship is specified in accordance with the functional form of the demand system used; in this particular case is given by Eq. (1). Therefore, having the same time-series properties is not a necessary condition to proceed further. Third, given the low power of static cointegration tests in discriminating against alternative hypotheses, a dynamic modeling procedure recommended by Banerjee et al. (1986) and Kremers et al. (1992) is used to test for cointegration whenever the above two alternatives fail. According to this methodology, an ECM is formulated and estimated. Then, the

hypothesis that the coefficient of error correction term is not statistically different from zero is tested using a traditional *t*-test. If the null hypothesis is not rejected, the series concerned are not cointegrated.

In the former cases, an ECM version of the AIDS can be set up and estimated using a seemingly unrelated regression (SUR) procedure, which adjusts for cross-equation contemporaneous correlation. At this stage, the imposition of symmetry and linear homogeneity restrictions can be statistically tested. Proceeding further, a budget-share equation should be excluded (adding-up property). Since SUR is sensitive to the excluded equation, the procedure should be iterated. The process of iteration ensures that the estimates obtained approach asymptotically those of the maximum likelihood method.

The estimated ECM form of the AIDS is given as:

$$\Delta w_i = \varepsilon_i \Delta w_{t-1} + \sum \gamma_{ij} \log p_j + \beta_i \Delta(m/P) + \lambda_i \mu_{it-1} + \mu_t \qquad (13)$$

In Eq. (13), Δ refers to the difference operator, μ_{it-1} are the estimated residuals from cointegration equations, and λ_i is expected to be negative. Cointegration ensures that shocks affecting commodity prices or real expenditures will be reflected on different expenditure shares in a similar way showing that these variables are moving together in the long-run obeying an equilibrium constraint.

DATA COLLECTION

This study utilise the annual time series data on prices, incomes, quantities and expenditures for the period 1961-2003. The data were obtained from the Department of Statistics, Malaysia. Prices are at the general level. Quantities and expenditures were placed on a per capita basis in order to account for the decrease in household size, which took place over this time period. Prices and expenditures were deflated by the consumer price index.

RESULTS AND DISCUSSION

The LA/AIDS model

In general the estimated results are quite reasonable in terms of goodness-of-fit and precision of the estimates. Estimated price coefficients are mostly statistically significant at the 5 percent level or better and estimated expenditure coefficients are also all statistically significant at the 5 percent level.

Table 1 shows the homogeneity and symmetry condition for the IADS model. Homogeneity and Symmetry imposed was not rejected at the 10% level, however, the symmetry condition holds in this model. The likelihood ratio test is rejected at 5 percent level. But the homogeneity condition is not rejected even in the 10% level.

Table 1: Test of Restriction of Homogeneity and Symmetry Conditions

Model	Likelihood function	Likelihood Ration Test(LRT)	χ^2	Probability
Homogeneity Imposed	572.0644	1.7407	3.742915	0.4419
Symmetry Imposed	582.4191	11.4060	13.284871	0.0223*
Homogeneity and Symmetry imposed	571.4024	2.4233	7.652028	0.6628

Note:* rejected at 5% level

Elasticities for LA/AIDS model are calculated based on linear functions of variables and parameters, it is sometimes the case that the elasticity estimates are consistent with expectation although the associated price coefficients are not. The empirical results presented in Table 2 have supported the evidence that rice is an inferior good in Malaysia, and wheat and others cereal are normal good. This finding can be considered as evidence there is structural changes in Malaysia to be a high level income' country since rice become an inferior good. As income rise further, consumers go for a diversified diet and prefer high-cost quality food with more proteins and vitamins, such as vegetables, bread, fish and meat.

Table 2: Estimated Coefficients for the LA/AIDS Model

	Rice	Wheat	Other Cereals
Constant	4.78**(1.9)	0.72 (3.1)	-4.5
LPR	-0.36*(1.7)	---	0.55
LPW	0.11** (3.8)	0.09**(2.4)	-0.2
LPC	-0.04* (2.5)	0.04**(4.6)	0.27
LEXP	-0.96* (2.7)	0.08*(2.0)	1.03
R^2	0.67	0.70	

The expenditure elasticity show the significant and negative value of -0.012 implies that when the income increase the expenditure for rice will decrease. This finding is consistent with the study by Ahmad (1980), Baharumshah (1993), Ishida (1995), and Nik Faud (1993) which concluded that rice was an inferior commodity as the demand elasticity of rice with respect to income was negative. However, this finding is contrary with the finding by Ishida, et al. (1993) which found the positive of income elasticity.

Table 3: Estimated Elasticities for the AIDS Model

Items	Price Elasticities			Expenditure Elasticities
	Rice	Wheat	Other cereals	
Rice	-0.035	0.16	-0.39	-0.012
Wheat	0.47	-0.14	-0.59	0.27
Other Cereals	-0.13	-0.58	-0.23	0.59

Moreover, in case of wheat and other cereals commodity in term of their expenditure elasticity, the results seem to support the hypothesis that wheat and other cereals are normal good in Malaysia. The expenditure elaticities for both commodities presented in Table 3 are positive and significance, imply that increase in income will be followed by increase in the expenditure for wheat and other cereals. This finding is consistent with the study by Baharumshah (1993), which show that the wheat is a normal good in Malaysia. Even though the magnitude of the expenditure elasticity in his study was higher compared with that of the finding of this study, this may be due to non inclusion the cereal commodity in his model.

The own-price elasticities for rice, wheat and other cereals are -0.035, -0.14 and -0.23, respectively. However, rice consumers do not respond to changes in the price of as much as they do to changes in the price of wheat and other cereals, indicating that demand for price is less price sensitive than that of demand for wheat and other cereals. Another interesting finding was that rice, wheat and other cereals tended to be price inelastic with low expenditure elasticity. This indicates that rice, wheat, and other cereals had already occupied a special position in the Malaysian diet.

In term of cross price elasticity, the results show that rice and wheat is substituting each other, whereas rice and other cereals are complement. This is reflected in their positive cross-price elasticities. The cross-price elasticity of wheat with respect to rice is 0.16. That means that a one percent increase in the price of wheat will increase the quantity of rice demanded by 0.16 percent. In contrast, a one percent increase in the price of other cereal will decrease the quantity of rice demanded by 0.39 percent. This finding is consistent with the finding by Baharumshah (1993), which show that the rice and wheat substitutes each other in Malaysia.

The AIDS-ECM Model

The first step of the AIDS-ECM analysis in this study is to check for the stationarity of all the variables (both dependent and independent variables). The unit property of the series is crucial for co-integration and causality analyses, which were examined using the standard Augmented Dickey Fuller (ADF) Tests. It is generally known that the results of these tests often depend on the number of lags included. Therefore careful attention must be paid to the selection of lag length.

Table 4: The Unit Root Test for Non-Stationary using Augmented Dicky Fuller

Variables	Level	1st Difference
LRP1	-1.26	-4.45
LRP2	-0.86	-5.36
LRP3	-2.36	-6.34
LW1	-0.42	-7.24
LW2	-2.15	-6.82
LW3	-0.23	-6.98
LX	-0.68	-6.37

The results presented in Table 4 indicate that the null hypothesis of a unit root could not be rejected for all variables in all levels. It implies that all the variables in the model are found to be I(1) non-stationary. As for the original data (at level) the null hypothesis of no unit root cannot be rejected at 1 percent, 5 percent and 10 percent affirming the conclusion that all the variables are non stationary at level. Selover, (1997), argued that in the case of non-stationary data, hypothesis of testing is invalid for regressions run in this level. However, this hypothesis of unit root was rejected for the first difference for most of the variables.

Given that integration of the two (or more) series is of the same order, a test was carried out to examine whether the two (or more) series are cointegrated over the same period. This followed by estimating the cointegration relationship. For more meaningful results, therefore, the possibilities of long-run equilibrium relationships among the variables in Malaysia' rice demand using the Johansen procedure were investigated. The optimal lag structure for Johansen-Juselius procedure was utilized to determine the number of cointegrating vectors, and the result is presented in Table 5. The result presented in Table 5 show that the unadjusted trace and λ-max tests point to the existence of two co-integrations. This confirms the economic theory that state that one economy should impact the others; it suggests any long-run equilibrating mechanism that would force them into co-integration (Engle and Granger, 1987).

Table 5: Testing for Cointegration Using the Johansen and Juselious Method

Test		$\lambda - Max$	Trace
Ho	H$_1$	49.86**	118.6**
r=0	r=1	37.12*	68.81
r ≤ 1	r=2	13.99	31.81
r ≤ 2	r=3	9.87	17.69
r ≤ 3	r=4	5.49	7.81
r ≤ 4	r=5	3.22	3.44

The final step of the data analysis in the AIDS-ECM model is the construction of the error correction model (ECM). The dependent variable in the ECM is the first differences of the dependent variables. As explained by equation (3), the ECM has three independent variables, which are the first differences of independent variables, the lag terms of the first difference of the dependent variables, and the residuals with a unit lag of the cointegrating relationships equations.

Comparing the estimated results between the AIDS model and AIDS-EC model revealed that the estimating parameter is fairly robust under the AIDS-EC Model. The empirical results indicate a satisfactory statistical fit as judged by the adjusted-R^2s. for all the dependent variables, the statistical test for residual autocorrelation does not reject the null hypothesis of no autocorrelation in the residuals at 5 percent level. According to the J-B and ARCH tests, heteroscedasticity does not pose any problem for any of the relationships at 5% level. The test statistics do not reject the hypothesis that the estimated equations possess a normal distribution. Moreover, Chow (1960) test for structural stability, all the relationships are structurally stable.

The estimated coefficients for the AIDS in error correction model are displayed in Table 6. Important finding can be derived from the Table 6. Firstly, estimated results are quite reasonable in terms of goodness-of-fit and precision of the estimates. All the parameter estimation has an expected sign. Estimated price coefficients are mostly statistically significant at the 5 percent level or better and estimated expenditure coefficients are also all statistically significant at the 5 percent level.

Secondly, the lagged dependent variable, which was included in the model to capture the long run adjustment toward the equilibrium, indicates that adjustment coefficient has a significant impact on rice, wheat, and other cereals consumption.

Finally, the results show that both of the error correction terms (ECT1 and ECT2) are statistically significant at one percent level, which indicates the existence of long run Granger sense causal relationship between the variables of the equation. The effect of the error correction term is to slow down the short-term growth of the dependent variable as evident by the negative sign of its coefficient. The magnitude of the coefficient of the error term (0.36 and 0.68) reveals that there is a small response of adjustment of the dependent variable to the error correction model. This result further proves that there is a long-run equilibrium relationship between the variables in the equation.

Table 6: Estimated Coefficients for the AIDS-ECM Model

	Rice	Wheat	Other Cereals
Constant	-0.0075 (2.2)	-0.002**(3.6)	0.009
ΔLPR	-0.02* (2.0)	---	0.16
ΔLPW	0.05*(1.82)	0.098*(2.6)	-0.148
ΔLPC	-0.06* (-1.6)	0.063**(4.2)	0.143
ΔLEXP	-0.0013 (1.9)	0.018 (1.7)	0.017
ΔWRt-1	0.07* (1.2)		
ΔWWt-1		-0.12* (2.3)	
ΔWCt-1			-0.05
ECT1	-0.38** (3.6)		
ECT2	-0.68**(3.2)		
R^2	0.53	0.60	

Such as in the AIDS model, the empirical results presented in Table 6 also have supported the evidence that rice is an inferior good in Malaysia, and wheat and others cereal are normal good. However, the magnitude of expenditure elasticity resulted from the AIDS-ECM model is fairly robust for rice to show that rice is an inferior good in Malaysia. The expenditure elasticity for rice show the significant and negative value of -0.17 implies that when the income increase the expenditure for rice will decrease by 0.17 percent only compare with that of resulted from the AIDS model -0.012. This finding is consistent with the previous study by Shamsuddin (2003) which show that Malaysia observed that the demand for rice as a staple food is decreasing steadily. Moreover, this finding is also Abdullah, et al, (2002) which show that rice tended to be price inelastic with low income elasticity of demand.

Table 7: Estimated Elasticities for the AIDS-EC Model

Items	Price Elasticities			Expenditure Elasticities
	Rice	Wheat	Other cereals	
Rice	-0.02	0.12	-0.10	-0.17
Wheat	0.24	-0.10	-0.42	0.33
Other Cereals	-0.19	-0.37	-0.37	0.17

The results of the expenditure elasticity of wheat and other cereals commodity also seem to support the hypothesis that wheat and other cereals are normal good in Malaysia. The expenditure elaticities for both commodities presented in Table 7 are positive and significant; imply that increase in income will be followed by increase in the expenditure for wheat and other cereals. However, the magnitude of expenditure elasticity for cereals resulted form AIDS-ECM model seem to be smaller compare with that of the expenditure elasticity resulted from the AIDS model. The elasticity of wheat with respect to income is 0.33 implies that when the income increase by one percent, the expenditure for wheat will increase by 0.33 percent. Meanwhile, the elasticity of other cereals with respect to income 0.17 implies that increase of income in one percent will be followed by increase in the expenditure for other cereals by 0.17 percent.

The own-price elasticities for rice, wheat and other cereals are -0.02, -0.10 and -0.37, respectively. However, rice consumers do not respond to changes in the price of as much as they do to changes in the price of wheat and other cereals, indicating that demand for price is less price sensitive than that of demand for wheat and other cereals.

In term of cross price elasticity, the results also show that rice and wheat is substituting each other, whereas rice and other cereals are complement. This is reflected in their positive cross-price elasticities. The cross-price elasticity of wheat with respect to rice is 0.12. That means that a one percent increase in the price of wheat will increase the quantity of rice demanded by 0.12 percent. This magnitude of elasticity is little bit smaller

compared with the previous model (0.16). In contrast, a one percent increase in the price of other cereal will decrease the quantity of rice demanded by 0.11 percent. This finding is consistent with the finding by Baharumshah (1993), which show that the rice and wheat substitutes each other in Malaysia.

CONCLUSION

In general, the results from both models are quite similar and are summarised below. Firstly, demand for the three commodity included in this study (rice, wheat, and other cereals) is own-price inelastic. The results suggest that both model resulted in the same conclusion in term of the commodity status in the Malaysian demand pattern. The results have supported the evidence that rice is an inferior good in Malaysia, and wheat and others cereal are normal good. Rice consumers do not respond to changes in the price of as much as they do to changes in the price of wheat and other cereals, indicating that demand for rice is less price sensitive than that of demand for wheat and other cereals. In term of cross price elasticity, the results show that rice and wheat is substituting each other, whereas rice and other cereals are complementing each other.

REFERENCES

Alston, J.M., Foster, T.K., and Green, R.D. 1994. Estimating Elasticities with the Linear Approximate Almost Ideal Demand System: Some Monte Carlo Results. *The Review of Economics and Statistics,* Vol. 76(2): 351 – 356.

Alston, J.M. and Chalfant, J.A. 1991. Can we Take the Com Out of Meat Demand Studies? *Western Journal of Agricultural Economics,* Vol. 16(1): 36 – 48.

Alston, J.M. and Chalfant, J.A. 1993. The Silence Of The Lambdas: A Test Of The Almost Ideal And Rotterdam Models. *American Journal of Agricultural Economics,* Vol. 75: 304 – 313.

Asche, F. and Wessels, C.R. 1997. On Price Indices in the Almost Ideal Demand System. *American Journal of Agricultural Economics*, Vol. 79: 1182 – 1185.

Baharumshah, 1993. A Model for the Rice and Wheat Economy in Malaysia. Centre of Agricultural Policy Studies (CAPS). Universiti Putra Malaysia.

Bansback, B. 1995. Towards A Broader Understanding of Meat Demand. *Journal of Agricultural Economics*, Vol. 46: 287 – 308.

Chavas, J.P. 1983. Structural Change in the Demand for Meat. *American Journal of Agricultural Economics*, Vol. 64: 150 - 153.

Davidson, R. and Mackinnon. J.G. 1981. Several Tests For Model Specification In The Presence Of Alternative Hypotheses. *Econometrica*, Vol. 49: 781 – 793.

Deaton, A. And Muelbauer, J. 1999. *Economics and Consumer Behavior.* Cambridge:University Press.

Deaton, A. And Muelbauer, J. 1980. An Almost Ideal Demand System. *The American Economic Review,* Vol. 70(3): 312 – 326.

Fraser, I. and Moosa, I.A. 2002. Demand Estimation in the Presence of Stochastic Trend and Seasonality: The Case of Meat Demand in the United Kingdom. *American Journal of Agricultural Economics,* Vol. 84(1): 83 - 89.

Greene, W.H. 2003. Econometric Analysis. Upper Saddle River, New Jersey: Prentice Hall.

Gujarati, D.N. 2001. *Essentials of Econometrics*, International Edition. Mcgraw-Hill, Boston.

Johnson, S.R., Hassan, Z.A. and Green, R.D. 1984. *Demand Systems Estimation, Methods and Applications*. Ames: The Iowa State University Press.

Kaabia, M.B., and Gil, J.M. (2001). Estimation and Inference in Cointegrated Demand Systems: An Application to Tunisian Meat Consumption. Europian Review of of Agricultural Economics Vol. 28 (3) (2003) pp. 349-370.

Kastens, Terry L.1996. Model Selection and Forecasting Ability of Theory-Constrained Food Demand System. *American journal of agricultural economics*, vol.78;301-312.

LAFRANCE, J.T. 1991. When Is Expenditure "Exogenous" In Separable Demand Models. *Western Journal Of Agricultural Economics*, Vol. 16(1): 49 – 62.

MOSCHINI, G. 1995. Units Of Measurement And The Stone Index In Demand System Estimation. *American Journal of Agricultural Economics,* Vol. 77: 63 - 68.

NAP (1998) Third National Agriculture Policy (1998-2010).

Newbold, P., Rayner, T. and Kellard, N. 2000. Long Run Drift, Co-Movement and Persistence In Real Wheat And Maize Prices. *Journal Of Agricultural Economics*, Vol. 51(1): 106– 121.

NG, S. 1995. Testing for Homogeneity in Demand Systems When Regressors Are Nonstationary. *Journal of Applied Econometrics*, Vol. 10 (2): 147 – 163.

Jikun Huanga,., Howarth Bouis (2001), Structural changes in the demand for food in Asia: empirical evidence from Taiwan Agricultural Economics 26 (2001) 57–69

Ana Mar´ýa Angulo, José Mar´ýa Gil,. And Azucena Gracia (2001). The demand for alcoholic beverages in Spain Agricultural Economics 26 (2001) 71–83.

M. Hossain (1997). ASIA: SUPPLY, DEMAND AND PRODUCTION POTENTIAL OF RICE IN ASIA. From the paper "Rice Supply and Demand in Asia: A Socioeconomic and Biophysical Analysis", in Applications of Systems Approaches at the Farm and Regional Levels,. Kluwer Academic Publishers, Dordrecht.

Madanmohan Ghosha, and John Whalleya, (2004). Food Demand and Calorie Consumption. *Journal of Development Economi*cs 73 (2004) 215– 232

Grist D.H. 1960 Formerly Agricultural Economics Colonial Agriculture service Malays Malaysia's Diverse Cultures Offer Challenges to Importers

Harumaini K.Abdul Rahman M. Nasri W. Anuar S. 2000 Issues and problems in the distribution network of rice in Peninsular Malaysia .Supply, demand and production potential of rice in asia* www.icid.org/v_**malaysia**.pdf. inter in 09/06/04.

Peggy S. Malo (Tuvalu), Rokeya Jesmine food security in malay households in sri kelantan low cost flats kuala lumpur, malaysia (Bangladesh), Utoomporn Sittisingh (Thailand) & Wendy L. Foley (Australia).

M. Hossain 2002 Rice Supply and Demand in Asia: A Socioeconomic and Biophysical Analysis",by of IRRI, in Applications of Systems Approaches at the Farm and Regional Levels

Ministry of Agriculture (1999) Third National Agricultural Policy 1998-2010, Kuala Lumpur

Mohd Ghazali Mohayidin and Loo Kau Fa (1989) The Potential of Bulk Paddy Post Harvest Handling System in Tanjong Karang, Malaysia in B.M. Mesa(ed). Grain Post Harvest Systems Asian Post Harvest Progra