



A comparative analysis of the performance of conventional and Islamic unit trust companies in Malaysia

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Abstract

Purpose – The purpose of this paper is to investigate the efficiency of selected conventional and Islamic unit trust companies in Malaysia during the period 2002 to 2005.

Design/methodology/approach – The paper adopts Data Envelopment Analysis (DEA) to investigate efficiency, as measured by the Malmquist index, which is decomposed into two components: efficiency change and technical change indexes.

Findings – The study indicates that technical efficiency is the main contributor to enhancing the efficiency of the Malaysian unit trust industry. In addition, the larger the size of the unit trust companies, the more inefficient the performance. In comparing the efficiency of unit trust companies, the study finds that some of the Islamic unit trust companies perform better than their conventional counterparts.

Research limitations/implications – The study is limited to five Islamic unit trust companies. Thus, the findings of this study are indicative, but inconclusive for the unit trust industry as a whole.

Practical implications – The results have two important implications for both conventional and Islamic unit trust companies in Malaysia. First, the deterioration of total factor productivity (TFP) in the unit trust industry in Malaysia is due to the deficiency of innovation in technical components. Second, the size of the unit trust companies has an adverse effect on the TFP performance.

Originality/value – The contribution of this study is that it analyzes the efficiency of the two types of unit trust industry which are important and relevant for Malaysia. This significance arises from the dual financial system, in which the Islamic unit trust companies operate in parallel with their conventional counterparts. The comparison sheds some light on the performance of the Islamic unit trust companies, whose operations are based on profit-sharing, in contrast to the conventional unit trust companies.

Keywords Unit trusts, Capital markets, Indexing, Islam, Economic performance, Malaysia

Paper type Research paper



1. Introduction

Information about the efficiency of portfolio investment, in this context, unit trust funds, is important to investors, simply because investors are motivated to ensure the

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maximum return on their investments. Therefore, information about the efficiency of unit trust funds is one of the major considerations in the fund-selection decision. Information about portfolio investment efficiency is also important to fund managers, to enable better pricing, a greater inflow of funds and improved profitability (Berger *et al.*, 1993). In addition, the ability to measure the efficiency of unit trust investments helps fund managers to gauge their own performance in comparison to their competitors. This ensures that relevant factors are emphasized in efforts to improve fund performance and outperform the relevant benchmarks (Al-Shammari and Salimi, 1998).

The efficiency of a portfolio investment can be measured by means of two approaches, parametric and non-parametric. The parametric approach essentially specifies a functional relationship between a performance variable and selected explanatory variables. Among the commonly used parametric approaches are the Stochastic Frontier Approach (see, for example, Yuengert, 1993), Distribution Free Approach (Troutt *et al.*, 2005) and Thick Frontier Approach (Ang and Lin, 2004). However, this approach has been heavily criticized due to its unrealistic assumptions (normality and linearity assumptions) in the specifications of the functional forms to be estimated (Sengupta, 1989).

In view of the shortcomings of the parametric approach, there has been an increasing interest in the non-parametric approach to measuring portfolio efficiency. The non-parametric approach is considered as superior to the parametric approach since it is not based on possibly invalid assumptions and is more general and flexible. The two most widely used forms of this approach are the Sharpe index (Sharpe, 1966) and Jensen's alpha (Jensen, 1968). The Sharpe index is essentially a risk-adjusted performance measure based on the reward to variability ratio, while Jensen's alpha is a measure for evaluating a portfolio manager's ability to predict security prices.

Continuous efforts are being made to further improve on the techniques for quantifying portfolio efficiency, leading to the development of the Data Envelopment Analysis (DEA) of Charnes *et al.* (1978). Essentially, the DEA is a linear programming formulation that defines a correspondence between multiple inputs and outputs. While this method was originally used to measure the performance of educational institutions, the DEA has been widely applied to measure the efficiency of various organizations, including banks (Sherman, 1984; Drake and Howcroft, 1994), insurance companies (Berger *et al.*, 1997; Cummins *et al.*, 1999a,b; Meador *et al.*, 2000), hospitals (Banker *et al.*, 1984), and retail sales unit (Mahajan, 1991).

The application of the DEA analysis to measure unit trust performance has been extensive. For instance, Murti *et al.* (1997) adopt the DEA analysis to examine the efficiency of the unit trust industry in the United States, by examining the relationship between return (representing benefit) and expense ratio, turnover, risk and loads (representing costs). The results of the study suggest that the efficiency of unit trusts is not related to transaction costs and that the impact of scale effect is mixed. Other studies investigating the efficiency of unit trust, using a similar approach, include Chang and Lewellen (1984), Land *et al.* (1993), and Banker and Thrall (1992).

However, to the best of our knowledge, there are no studies investigating the efficiency of unit trusts in Malaysia using the DEA approach. Most of the existing studies on the performance of Malaysian unit trusts rely on the CAPM. This includes Ismail and Shakrani (2003) on Islamic unit trust performance in Malaysia, and

Shamsher and Annuar (1995), which uses several benchmark performance measures to assess the performance of 54 unit trust funds in Malaysia over the period 1988 to 1992. The study finds that the return on unit trusts investment in Malaysia is well below the risk free rate and stock market returns. Chua (1985) uses the Sharp Index and Treynor Index to examine the performance of 12 unit trust funds in Malaysia over two sub-periods: 1974-1979 and 1979-1984. He finds that fund characteristics such as size, expense ratio and portfolio turnover are all negatively correlated to performance. Chuan (1995) uses monthly data covering the period 1984-1993 on a sample of 21 unit trust funds, employing several investment measures, namely, the Adjusted Sharpe Index, Treynor Index, Jensen's Alpha and the Adjusted Jensen's Alpha. The results show that the unit trust funds as a whole, performed worse than the market and the fund characteristic, namely the expense ratio, correlates negatively with fund performance. Likewise, Tan (1995) and Chuan (1995) use the benchmark model based on Jensen's alpha and the CAPM, to compare the actual portfolio returns against that of the market benchmarks. Later studies with Malaysian data, continue to employ the benchmark model on larger samples, including Low and Ghazali (2005) and Low (2007).

In view of the above research scenario, this present study intends to fill the gap by applying the DEA to investigate the efficiency of selected conventional and Islamic unit trust companies in Malaysia. Apart from using the DEA and a more recent data set, another innovative aspect of this study is that it compares the efficiency of the conventional unit trust companies with that of the Islamic unit trusts. The performance of the conventional unit trusts and Islamic unit trusts are expected to be different, since the former are subject to the capital market rules, while the Islamic unit trusts are subject to both the capital market rules and *shari'ah* principles. Despite the fact that more than 90 percent of the shares listed are *shari'ah*-compliant, the remaining 10 percent of the shares listed may comprise highly profitable *non-shari'ah*-compliant activities. According to Ghoul *et al.* (2007), companies which are not acceptable based on Islamic principles include the majority of financial institutions involved in money lending and the charging of interest, such as bank and insurance companies. Other screening criteria prohibit investments involving the production, distribution and/or earning profits from alcohol, pornography, tobacco, gambling, weapons, music, entertainment, processing pork meat or *non-halal* meat, hotels and airlines which serve alcohol.

Comparing and contrasting the efficiency of the two types of unit trust industry is important and relevant for Malaysia, because of its dual financial system, in which Islamic unit trust companies operate parallel with their conventional counterparts. The comparison thus sheds light on the performance of the Islamic unit trust companies, whose operations are limited to selected *shari'ah*-compliant companies, as opposed to the conventional unit trust companies which can invest in any suitable companies that can potentially give the highest return. Ultimately, the findings of the study are expected to contribute towards improving the efficiency of the unit trust industry in Malaysia as a whole.

The rest of this study is organized as follows. Section 2 presents an overview of the unit trust industry in Malaysia. Section 3 describes the data and discusses the methodology of the DEA. Section 4 presents the results and analysis, and Section 5 concludes.

2. Overview of the Malaysian unit trust industry

A unit trust fund is a professionally managed, collective investment scheme that pools client money and invests it with a specific objective, as stated in its documentation. Unit trust funds can be invested in a variety of assets or investment classes, which may not be available to an individual investor. These classes may include government bonds and corporate bonds. Such investments require a large amount of funds which are often beyond the capability and affordability of individual investors. Collectively, however, those investments can become accessible. The type of investment portfolios in unit trust funds depends on the nature of the fund, as well as its objectives and investment strategy. For example, a bond fund provides an individual investor with access to the bond market and a potentially steady stream of income (Prudential, 2007).

In Malaysia, the unit trust industry had its modest beginnings in 1959, when the first unit trust management company, the Malayan Unit Trusts Limited, was launched in August 1959, by a group of Australian investors. During the 1960s and 1970s, the unit trust industry was dominated by two major players, ASM MARA Unit Trust Management and Asia Unit Trusts Berhad, companies owned by the Majlis Amanah Rakyat Malaysia (MARA) or the Council of Trust for the Indigenous, a body set up by the Malaysian government to improve the socio-economic conditions of the indigenous people. The 1970s also witnessed the launching of state-government sponsored unit trusts, which may have been launched in reaction to the Federal Government's call to mobilize domestic household savings.

The 1980s marked an important development in the unit trust industry, when Skim Amanah Saham Nasional (National Unit Trust Scheme), managed by Permodalan Nasional Berhad (PNB) was launched on 20th April 1981. The launching of Skim Amanah Saham Nasional provided the impetus for new growth in the industry and enabled the government to fulfill its objective of mobilizing the savings of the indigenous people over the long-term. The 1980s also witnessed the emergence of unit trust management companies, which are subsidiaries of financial institutions. The establishment of the bank-affiliated unit trust management companies indicated a significant development in the industry, as their involvement had, in many ways, assisted the marketing and distribution of unit trusts through banks' branch networks, thus widening the channels used in reaching potential investors.

During the 1990s, most of the unit trusts launched were equity funds. The rapid growth of the unit trust industry could be observed from the number of unit trust management companies, which tripled from 13 in 1992 to 37 in 2002 (Md Taib and Isa, 2007). Prior to the 1997 Asian financial crisis, the size of the approved unit trusts were larger. However, weak demand resulting from the crisis, particularly in 2000, saw smaller unit trusts being launched.

The establishment of structured Islamic funds management in Malaysia took place in early 1993, when a private unit trust fund was first launched. The first Islamic trust fund, Tabung Ittikal, by Arab-Malaysian Securities, was established on 12th January 1993 and became the precursor to the development of an Islamic unit trust sector in the country (Barom, 2004). More *shari'ah* unit trusts were launched thereafter and by 31 December 2000, there were 13 *shari'ah* unit trusts (Permodalan Nasional Berhad, 2001). As at 31 March 2007, there were 99 *shari'ah*-based funds, comprising 47 equity funds, 20 balanced funds, 18 bond funds, and 14 other funds (Securities Commission, 2007). The rapid development of the Islamic unit trust sector in the Malaysian capital market

signifies another continuous commitment on the part of the Malaysian government in setting up a fully-fledged Islamic financial system in Malaysia. This system conforms to Islamic principles and is intended to be as efficient and competitive as its conventional counterpart in serving the financial needs of the Malaysian community.

The Islamic unit trust sector in Malaysia is a subset of the overall unit trust industry and a component of the Malaysian Islamic capital market. The industry is highly regulated by the government through the Securities Commission (SC), in order to safeguard investor interests and guarantee the integrity and systemic stability of the industry. Noordin (2002), as cited in Barom (2004), states that the Islamic unit trust schemes are a group of collective investment funds, which give investors the opportunity to invest in a professionally managed and diversified portfolio of securities that conform to the principles of *shari'ah*. Such *halal* securities do not include the stock of companies involved in conventional financial services (banking and insurance), gambling, alcoholic beverages and non-*halal* food products. Alhabshi (1994), as cited in Barom (2004), explains that Islamic unit trusts must also avoid involvement with *riba'* or interest, dubious transactions, and other forms of unethical or immoral activities, such as market manipulations, insider trading, short selling, and even excessive exposure of one's financial position by contra deals that cannot be backed by sufficient funds.

The returns from an Islamic unit trust fund must go through a process of cleansing or purification from any interest elements. Proceeds (dividends) of permissible securities that originate from mixed sources with non-*halal* or dubious revenues must also be removed. In addition, returns from securities which were previously permissible, but have subsequently been confirmed non-*halal* and removed from the updated list of approved *shari'ah* securities, and which could not be disposed of due to market conditions, are also excluded (Barom, 2004).

In view of the increasing role played by Islamic unit trusts in the Malaysian financial sector, several empirical studies have been conducted to assess various aspects of the industry. For example, Ismail and Shakrani (2003) examine the relationship between betas and returns to Islamic funds, using the unconditional CAPM and conditional CAPM. The results suggest that the relationship between beta and returns depends on market conditions. In particular, there is a highly significant relationship between positive and negative beta coefficients during bull and bear phases, respectively. In addition, the conditional relationship is shown to be stronger in the bear phases than in bull phases, implying that Islamic fund investors are relatively risk averse.

Abdullah *et al.* (2007) evaluate the performance of Malaysian Islamic unit trusts and compare them with conventional ones, by utilizing monthly returns adjusted for dividends and bonuses, for 65 funds over the period of January 1992 to December 2001. Based on non risk-adjusted returns, conventional and Islamic funds perform worse than the market for the total sample period data. However, the returns on Islamic funds are about the same as those of conventional ones. Interestingly, when risk-adjusted returns are considered, the performance of Islamic funds is better than that of conventional funds during financial crisis and post-crisis periods.

3. Data sources and methodology

This study utilizes data in the form of two inputs and one output to investigate the efficiency of the Malaysian unit trust industry. According to Murti *et al.* (1997) in

portfolio management, performance is evaluated in terms of cost-benefit ratios. That is, consumers want funds that simultaneously maximize the benefits (returns) and minimize the costs (expense ratio, portfolio turnover ratio, and loadings). This framework is consistent with notions of market efficiency regarding transaction costs in the unit trust industry. However, because of data availability constraints, our study considers only two inputs: expenses ratio and portfolio turnover ratio. Consistent with previous work by Ippolito (1989), Bauman and Miller (1994), Murti *et al.* (1997), Sengupta and Zohar (2001), and Daraio and Simar (2006), the inputs used in this study are the management expenses ratio and portfolio turnover ratio.

The portfolio turnover ratio (PTR) is defined as:

$$\text{PTR} = \frac{(\text{Total acquisitions for the year} + \text{total disposal for the year}) \div 2}{\text{Average value of the fund calculated on daily basis}}$$

while management expenses ratio (MER) refers to:

$$\text{MER} = \frac{\text{Fees} + \text{recoverable expenses}}{\text{Average value of the fund calculated on daily basis}} \times 100$$

or

$$\frac{(A + B + C + D)}{E} \times 100$$

where:

- A = Annual management fees;
- B = Annual trustee fees;
- C = Auditor remuneration;
- D = Administration expenses and tax agent fees;
- E = Average net assets value of trust fund.

The output used in this study is returns, as in Ippolito (1989), Droms and Walker (1996), and Murti *et al.* (1997). In the first instance, the aim was to investigate a larger sample, but a complete data set for the period 2002-2005 is only available for 27 unit trust companies. The data employed in this paper were gathered from the annual reports of these companies. Even though there are some other useful inputs such as brand, marketing, and mode of sales distribution, the information cannot be obtained from the annual report of a particular unit trust company. Incorporating these potential inputs would make the study more comprehensive, but data limitations do not permit their inclusion.

In exploring the contributions of technical and efficiency changes to productivity increases in the Malaysian unit trust industry, the study adopts the generalized output-oriented Malmquist index developed by Fare *et al.* (1989). The Malmquist indexes are constructed using the Data Envelopment Approach (DEA) and estimated using Coelli (1996) DEAP version 2.1. To date, the Malmquist productivity indexes and DEA have been used in a variety of studies. These studies include aggregate comparisons of productivity between countries (Fare *et al.*, 1994a) as well as of various

economic sectors (see for example, Tauer (1998) and Mao and Koo (1996), Alam and Sickless (1995) on airlines; Asai and Nemoto (1999) and Calabrese *et al.* (2001) on the telecommunications industry; Tulkens and Malnero (1996) on banking; Avkiran (2001) on universities; Cummins *et al.* (1999a), Abu Mansor and Radam (2000), and Diacon *et al.* (2002) on insurance). Ali and Seiford (1993) highlighted that DEA is a well-established, non-parametric efficiency measurement technique, which has been used extensively in over 400 studies of efficiency in the management sciences over the last decade. For the purpose of this study, a more appropriate method is the cross-efficiency frontiers technique of Cummins *et al.* (1999a). However, due to the small sample of Islamic unit trusts, compared to that of their conventional counterparts, the Malmquist total factor productivity (TFP) approach is adopted.

One limitation of using the TFP Malmquist approach is that it is sensitive to market conditions, such that a period of declining returns is associated with declining productivity. However, the Malmquist TFP approach takes this into account indirectly. For instance, poor market conditions will affect the output of unit trusts in the country and in turn, affect their productivity. The average total productivity of the unit trusts across the country may fall, but still there are firms on the best-practice (efficiency) frontier. Using the Malmquist TFP approach enables us to measure the efficiency of unit trusts with respect to particular market conditions, relative to a unit trust on the best practice frontier and also to compare the efficiency of the unit trust across different time periods. In short, the Malmquist productivity approach can be used to identify productivity differences between two firms, or one firm over two-time periods. However, if the study focuses on unit trusts across countries, then different market conditions could be a major consideration. Nonetheless, this study considers the performance of unit trusts in Malaysia alone.

Following Fare *et al.* (1989), the Malmquist TFP index is written as follows:

$$M_o(x^t, y^t, x^{t+1}, y^{t+1}) = \frac{D_o^{t+1}(x^{t+1}, y^{t+1})}{D_o^t(x^t, y^t)} \times \left[\left(\frac{D_o^t(x^{t+1}, y^{t+1})}{D_o^{t+1}(x^{t+1}, y^{t+1})} \right) \left(\frac{D_o^t(x^t, y^t)}{D_o^{t+1}(x^t, y^t)} \right) \right]^{\frac{1}{2}} \quad (1)$$

where the notation $D_o^t(x^{t+1}, y^{t+1})$ represents the distance from the period $t + 1$ observation to period t technology. The first ratio on the right-hand side of equation (1) measures the change in relative efficiency (i.e. the change in how far observed production is from maximum potential production between years t and $t + 1$). The second term inside the brackets (geometric mean of the two ratios) captures the shift in technology (i.e. movements of the frontier function itself) between the two periods evaluated at x^t and x^{t+1} . Essentially, the change in relative efficiency measures how well the production process converts inputs into outputs (catching up to the frontier) and the latter reflects improvement in technology.

According to Fare *et al.* (1994a), improvements in productivity yield Malmquist index values greater than unity. A deterioration in performance over time is associated with a Malmquist index less than unity. The same interpretation applies to the values derived from components of the overall TFP index. Improvements in the efficiency component yielded index values greater than one, which can be considered evidence of a shift towards the frontier. Values of the technical change component greater than one are considered to be evidence of technological progress.

Consistent with Fare *et al.* (1994a), this study uses an enhanced decomposition of the Malmquist index, decomposing the efficiency-change component, calculated relative to constant-returns-to-scale technology, into a pure efficiency component (calculated relative to the variable returns to scale (VRS) technology) and a scale-efficiency change component which captures changes in the deviation between the VRS and constant-returns-to-scale (CRS) technology. The subset of pure efficiency change measures the relative ability of operators to convert inputs into outputs, while scale efficiency measures the extent to which the operators can take advantage of returns to scale, by altering its size in the direction of the optimal scale.

4. Empirical results and analysis

4.1 Input and output specifications

Two inputs and one output are utilized to investigate the efficiency of the unit trust industry in Malaysia in this study. The inputs are the portfolio turnover ratio and management expenses ratio, while the output is returns. These inputs and output are used to investigate the efficiency of 27 unit trust companies in Malaysia, of which five are Islamic unit trust companies. The unit trust companies under study are HLG Dana Makmur, KL Ittikal Fund, Mayban Dana Yakin, Pacific Dana Aman, RHB Islamic Bond Fund, Alliance Vision Fund, Apex Small-Cap Fund, APEX CI Tracker Fund, APEX Malaysia Growth Trust (Apex MG Trust), HLB Construction, Infrastructure and Property Sector Fund (CIPSF), HLB Consumer Products Sector Fund (CPSF), HLB Finance Sector Fund (FSF), HLB/HLG Blue Chip Fund, HLB Industrial and Technology Sector Fund (ITSF), HLB Penny Stock Fund, HLB Trading/Service Sector Fund (TSSF), KLCI Tracker Fund, Mayban Income Trust Fund, Mayban Unit Trust Fund, OSK-UOB Equity Trust, OSK-UOB Kidsave Trust, OSK-UOB Small Cap Opportunity (SCO) Unit Trust, Public Industry Fund, Public Small Cap Fund, PB Balanced Fund, RHB Bond Fund, and TA Comet Fund. It is important to stress that the unit trusts included in this study consist of a combination of both passively-managed (tracker) and actively-managed funds. A tracker fund is categorized as passively managed, yet it is one of most efficient, due to the low fees paid for a simple tracking process. While there may be some differences in the investment approaches between these two groups of unit trusts, the funds selected in this study invest in a wide variety of economic sectors. Moreover, the main focus of the study is to compare the efficiency of Islamic and conventional unit trusts. Even though there may be differences in the investment philosophy between the two groups of funds, it is beyond the scope of this study to consider them. However, this aspect could be a useful and interesting area for future research. The first five funds included in the study are operated on *shari'ah* principles, while the rest are based on the conventional practices. Data on inputs and outputs are collected from the period 2002 to 2005.

Table I reports the descriptive statistics of the inputs and output of the 27 unit trust companies in Malaysia during the period of study. The average returns within the period are 11.085, while the average portfolio turnover ratio and management expense ratio are 0.718 and 1.633, respectively. Based on the individual firm analysis, the Alliance Vision Fund yields the highest output, which occurred in 2002, while the OSK-UOB Small Cap Opportunity Unit Trust records the lowest output, in 2005. With respect to the inputs, the Apex Small-Cap Fund and APEX CI Tracker Fund yield the highest portfolio turnover and management expenses in 2002. The HLB CPSF and

RHB Islamic bond funds yield the lowest portfolio turnover and management expenses in 2003 and 2004, respectively[1].

The two inputs and one output can be imposed on the x - and y -axes to show the performance of all 27 mutual unit trusts relative to each other. Figure 1 illustrates this procedure, where the x -axis represents the portfolio turnover ratio to returns, while the y -axis represents the management expenses ratio to returns. The unit trust which is nearer to the point of origin can be regarded as more efficient than those which are farther away from it. As illustrated in Figure 1, with the exception of Maybank Dana Yakin, which is numerically distant from the remainder of the observations, 26 unit trusts are clustered in the lower quadrant of the graph. One of the tracker funds, namely the APEX CI Tracker fund, is shown to be more efficient with respect to the management expenses ratio to returns, than the portfolio turnover ratio to returns. Four out of five Islamic unit trusts, namely KL Ittikal, Pacific Dana Aman, HLG Dana Makmur and the RHB Islamic Bond Fund are shown to perform better than most of the conventional unit trusts, with their data points being nearer to the origin. Thus, in general, it can be inferred that the Islamic frontier performs better than the conventional frontier.

4.2 Production frontier and efficiency

Since the basic component of the Malmquist productivity index is related to measures of efficiency, Table II reports the efficiency change for the 27 unit trust companies from 2002-2005 for both constant-returns-to-scale (CRS) and variable returns-to-scale (VRS). The value of unity implies that the firm is on the industry frontier in the associated year, while values less than unity imply that the firm is below the frontier or technically inefficient. Thus, the lower the values than unity, the more inefficient the firm, compared to those firms with values closer to unity.

As reported in Table II, for 2002, the Alliance Vision Fund and Mayban Unit Trust Fund are found to be the only two unit trust funds which were consistently efficient, both under CRS and VRS. In 2003, the Alliance Vision Fund and TA Comet Fund were consistently efficient under both CRS and VRS. The KLCI Tracker Fund is the only consistently efficient fund in 2004, while in 2005, four unit trust companies are found to be consistently efficient, namely, RHB Islamic Bond Fund, Mayban Income Trust Fund, HLB CPS Fund and RHB Bond Fund. Although the RHB Bond Fund was only found to be on the industry frontier in 2005 based on CRS, it is found to be on the frontier for three consecutive years, 2003, 2004 and 2005, based on VRS. On the other hand, the Mayban Unit Trust Fund, which was found to be on the industry frontier in 2002, based on CRS, is found to be on the frontier for 2002, 2003 and 2004, based on VRS. These indicate that the unit trust companies have successfully kept pace with

Table I.
Descriptive statistics of
inputs-output of the unit
trust industry, 2002-2005

	Inputs		Output
	Portfolio turnover ratio (Times)	Management expenses ratio (%)	Returns (%)
Mean	0.718	1.633	11.085
Median	0.575	1.630	8.215
Standard dev.	0.567	0.333	13.901
Minimum	0.020	0.540	- 23.680
Maximum	2.580	2.970	49.500

Table II.
Efficiency of the unit
trust industry, 2002-2005

No.	Firms	Constant returns to scale (CRS)			Variable returns to scale (VRS)			
		2002	2003	2004	2002	2003	2004	2005
<i>Islamic Unit Trust</i>								
1	HLG Dana Makmur	0.825	0.364	0.691	1.000	0.364	0.691	0.575
2	KL Irtikal Fund	0.587	0.409	0.824	0.970	0.409	0.824	0.970
3	Mayban Dana Yakin	0.593	0.167	0.765	0.364	0.167	0.765	0.450
4	Pacific Dana Aman	0.566	0.288	0.985	0.576	0.288	0.985	0.576
5	RHB Islamic Bond Fund	0.579	0.909	0.882	1.000	0.968	0.909	1.000
	Geomean	0.623	0.365	0.823	0.624	0.370	0.828	0.679
<i>Conventional Unit Trust</i>								
1	Alliance Vision Fund	1.000	1.000	0.971	1.000	1.000	0.971	0.424
2	APEX CJ Tracker Fund	0.106	0.727	0.574	0.173	0.727	0.574	0.650
3	APEX-MG Trust	0.307	0.833	0.412	0.387	0.833	0.412	0.425
4	Apex Small-Cap Fund	0.367	0.348	0.662	0.693	0.348	0.662	0.400
5	HLB CIPSF	0.560	0.667	0.279	0.560	0.667	0.279	0.600
6	HLB CPSF	0.453	0.530	0.500	0.453	0.530	0.500	1.000
7	HLB FSF	0.573	0.636	0.559	0.573	0.641	0.564	0.818
8	HLB/HLG Blue Chip Fund	0.507	0.500	0.412	0.507	0.500	0.412	0.775
9	HLB ITSF	0.547	0.636	0.324	0.547	0.636	0.324	0.667
10	HLB Penny Stock Fund	0.573	0.576	0.397	0.573	0.576	0.397	0.675
11	HLB TSSF	0.453	0.879	0.485	0.453	0.879	0.485	0.625
12	KLCI Tracker Fund	0.547	0.606	1.000	0.547	0.606	1.000	0.697
13	Mayban Income Trust Fund	0.614	0.970	0.882	0.744	1.000	0.909	1.000
14	Mayban Unit Trust Fund	1.000	0.697	0.971	1.000	0.909	1.000	0.909
15	OSK-UOB Equity Trust	0.366	0.697	0.588	0.413	0.697	0.588	0.650
16	OSK-UOB Kidsave Trust	0.614	0.394	0.603	0.693	0.394	0.603	0.848
17	OSK-UOB SCO Unit Trust	0.467	0.985	0.309	0.467	0.985	0.309	0.030
18	PB Balanced Fund	0.680	0.379	0.676	0.680	0.379	0.676	1.000
19	Public Industry Fund	0.547	0.818	0.426	0.547	0.818	0.426	0.900
20	Public Small Cap Fund	0.587	0.621	0.586	0.587	0.621	0.586	0.725
21	RHB Bond Fund	0.596	0.939	0.853	1.000	0.596	1.000	1.000
22	TA Comet Fund	0.708	1.000	0.353	0.800	1.000	0.353	0.525
	Geomean	0.512	0.671	0.542	0.559	0.685	0.547	0.609
	Overall Geomean	0.531	0.599	0.585	0.582	0.611	0.591	0.621

technically feasible production possibilities and improved their distance to the industrial production frontier for both versions of technology.

Table II shows the percentage of the realized output level compared to the maximum potential output level for the given input mix. For example, in 2002, the Islamic unit trusts produced 62.3 percent of their potential output level, while the conventional unit trusts produced 51.2 percent of their potential output under CRS. Under VRS of the same year, Islamic unit trust companies produced 70.0 percent of their potential output level, whereas the conventional unit trust companies produced 56.0 percent of their potential output.

During all the years of analysis, the efficiency of 17 firms is found to be above average (56.7 and 60.1 percent for CRS and VRS, respectively) based either on CRS or VRS. The most efficient firm based on CRS (89.4 percent) and VRS (87.7 percent) is the Mayban Unit Trust Fund. On the other hand, the least efficient fund is the APEX Small-Cap Fund (42.5 percent) under CRS, and the OSK-UOB SCO Unit Trust (44.8 percent) under VRS. Out of the five unit trust companies, the efficiencies of four Islamic unit trust companies are above average, except for Mayban Dana Yakin, based on both CRS and VRS. On average, the five Islamic unit trusts perform better with a CRS of 60.9 percent and VRS of 64.3 percent, while conventional unit trusts at 56.5 percent and 60 percent, respectively.

These findings further indicate that investors with funds in some Islamic unit trust companies may be better off than some of the conventional unit trust companies. This suggests the financial viability of Islamic unit trust funds in competing with their conventional counterparts in a dual financial system such as that of Malaysia.

As indicated by the weighted geometric mean in Table II, the average efficiency for the entire industry increased from 53.1 percent in 2002 to 59.9 percent in 2003, but showed a slight decrease to 58.5 percent in 2004 and declined further to 55.0 percent in 2005. As for VRS, the average efficiency increases from 58.2 percent in 2002 to 61.1 percent in 2003. The average efficiency declined to 59.1 percent in 2004, but increased again to 62.1 percent in 2005. In other words, the efficiency performance of Malaysia's unit trust industry continues to improve, based on VRS than CRS.

4.3 Productivity performance of individual companies

Table III reports the performance of the unit trust companies from 2002 to 2005 in terms of TFP change and its two subcomponents, technical change and efficiency change. Note that a value of the Malmquist TFP productivity index and its components of less than one, implies a decrease or deterioration in productivity. Conversely, values greater than one indicate improvements in productivity with regard to the relevant aspect. Thus, subtracting 1 from the number reported in the table yields an average increase or decrease per annum for the relevant time period and relevant performance measure. Also note that these measures capture performance relative to the best practice decision-making unit (DMU) in the relevant performance or relative to the best practice in the sample.

As reported in Table III, the Apex CI Tracker Fund, Mayban Dana Yakin and HLB CIPSF have the highest average TFP growth at an annual average rate of 477.3 percent, 372.7 percent and 26.3 percent for the period of 2002-2003, 2003-2004 and 2004-2005, respectively. By contrast, Mayban Dana Yakin recorded the greatest deterioration in TFP for the period 2002-2003 at an annual average rate of -79.3

Table III.
Unit trust firms relative
Malmquist TFP,
technical and efficiency
changes 2002-2005

No.	Unit trust firms	Malmquist TEP change			Technical change			Efficiency change		
		2002-2003	2003-2004	2004-2005	2002-2003	2003-2004	2004-2005	2002-2003	2003-2004	2004-2005
<i>Islamic Unit Trust</i>										
1	HLG Dana Makmur	0.345	1.958	0.489	0.784	1.023	0.728	0.441	1.901	0.672
2	KL Itrikal Fund	0.614	2.074	0.571	0.889	1.030	0.485	0.697	2.013	1.177
3	Mayban Dana Yakin	0.207	4.727	0.346	0.737	1.030	0.728	0.281	4.588	0.476
4	Pacific Dana Aman	0.396	3.526	0.347	0.779	1.033	0.594	0.508	3.423	0.584
5	RHB Islamic Bond Fund	0.998	1.000	1.100	0.636	1.140	0.971	1.570	0.971	1.133
	Geomean	0.444	2.323	0.517	0.761	1.050	0.683	0.586	2.255	0.757
<i>Conventional unit trust</i>										
1	Alliance Vision Fund	0.880	1.000	0.212	0.880	1.000	0.485	1.000	0.971	0.437
2	APEX CI Tracker Fund	5.773	0.813	0.544	0.844	1.030	0.594	6.839	0.789	0.916
3	APEX-MG Trust	1.897	0.509	0.607	0.698	1.030	0.971	2.716	0.494	0.626
4	Apex Small-Cap Fund	0.701	1.957	0.411	0.737	1.420	0.841	0.950	1.899	0.488
5	HLB CIPSF	1.048	0.432	1.263	0.880	1.030	0.728	1.190	0.419	1.735
6	HLB CPSF	1.029	0.971	0.971	0.880	1.213	0.485	1.170	0.943	2.000
7	HLB FSF	0.997	0.905	0.870	0.880	1.030	0.594	1.110	0.878	1.464
8	HLB/HLG Blue Chip Fund	0.868	0.848	1.107	0.880	1.051	0.728	0.987	0.824	1.521
9	HLB ITSF	1.024	0.524	1.225	0.880	1.030	0.594	1.164	0.508	2.061
10	HLB Penny Stock Fund	0.884	0.711	1.000	0.880	1.227	0.728	1.004	0.690	1.374
11	HLB TSSF	1.706	0.569	0.758	0.880	1.007	0.728	1.939	0.552	1.041

(continued)

No.	Unit trust firms	Malmquist TEP change			Technical change			Efficiency change		
		2002-2003	2003-2004	2004-2005	2002-2003	2003-2004	2004-2005	2002-2003	2003-2004	2004-2005
12	KLIC Tracker Fund	0.976	1.700	0.338	0.880	1.030	0.485	1.109	1.650	0.697
13	Mayban Income Trust Fund	1.005	0.938	1.100	0.636	1.010	0.974	1.580	0.910	1.133
14	Mayban Unit Trust Fund	0.497	1.435	0.909	0.714	1.030	0.971	0.697	1.393	0.937
15	OSK-UOB Equity Trust	1.484	0.870	0.650	0.779	1.000	0.728	1.905	0.844	0.893
16	OSK-UOB Kidsave Trust	0.500	1.577	0.836	0.779	1.030	0.594	0.642	1.531	1.407
17	OSK-UOB SCO Unit Trust	1.747	0.323	0.048	0.828	1.030	0.481	2.110	0.314	0.098
18	PB Balanced Fund	0.490	1.840	0.710	0.880	1.101	0.594	0.557	1.786	1.195
19	Public Industry Fund	1.317	0.537	1.014	0.880	1.012	0.594	0.497	0.521	1.705
20	Public Small Cap Fund	0.932	0.927	0.623	0.880	1.020	0.594	1.059	0.900	1.048
21	RHB Bond Fund	1.001	0.935	0.805	0.634	1.030	0.686	1.575	0.908	1.172
22	TA Comet Fund	1.100	0.364	0.875	0.779	0.080	0.728	1.413	0.353	1.202
	Geomean	1.066	0.832	0.654	0.813	0.943	0.662	1.310	0.807	0.988
	Overall Geomean	0.906	1.006	0.626	0.803	1.030	0.665	1.128	0.977	0.940

Conventional
and Islamic unit
trust companies

Table III.

percent, while the OSK-UOB Small Cap Opportunity Unit Trust is found to have the lowest average TFP growth for the periods 2003-2004 and 2004-2005, at annual average rates of -67.7 percent and -95.2 percent, respectively. The positive average TFP changes by (0.6 percent) for all firms recorded only during the 2003-2004 period, while the TFP changes over 2002-2003 and 2004-2005 deteriorated at an annual rate of -9.4 percent and 37.4 percent.

In terms of technical efficiency changes, the average growth in technical efficiency for all firms was negative during the periods 2002-2003 and 2004-2005, with annual growth rates of -19.7 percent and -33.4 percent. However, for 2003-2004, the growth rate in technical efficiency was positive (3 percent). Individually, the Apex Small-Cap Fund recorded the highest technical progress of 42 percent over the period 2003-2004. By contrast, the RHB Bond Fund showed the highest technical regress of 37 percent for the period 2002-2003, while the TA Comet Fund was found to have the lowest average technical change for the period 2003-2004 at an annual average rate of -92 percent. For the period 2004-2005, the OSK-UOB SCO Unit Trust experienced a technical regress of 51.9 percent. Contrarily, the lowest deterioration in technical change were the KL Ittikal Fund (-11.1 percent) in 2002-2003, and the Mayban Income Trust Fund (-2.6 percent) in 2004-2005. However, in 2003-2004, the Apex Small Cap Fund recorded the highest average technical growth at 42 percent annually.

Finally, the average efficiency change for the entire industry was only positive in the period 2002-2003, with an annual rate of 12.8 percent, while negative growth rates in efficiency changes were recorded over 2003-2004 and 2004-2005, at annual rates of -2.3 percent and -6 percent, respectively. The Apex CI Tracker Fund Unit Trust is found to have the highest growth rate in efficiency in 2002-2003, with annual rate of 583.9 percent, Mayban Dana Yakin (358.8 percent) in 2003-2004, and HLB ITSF (106.1 percent) in 2004-2005. Conversely, Mayban Dana Yakin recorded the highest deterioration in efficiency growth in 2002-2003, with annual rate of -71.9 percent, and OSK-UOB SCO Unit Trust (-68.6 percent) in 2003-2004, and (-90.2 percent) in 2004-2005.

In short, the changes in TFP during the period of study are caused mostly by changes in efficiency, as compared to technical efficiency changes. The TFP growth rates were negative in 2002-2003 and 2004-2005, due to a deterioration in technical efficiency. In contrast, the TFP growth rate was positive in 2003-2004, due to a positive change in technical efficiency. The TFP change, on average, yields only minimal growth in the periods of 2003-2004 with 0.6 percent, but it deteriorated between 2002-2003 and 2004-2005 by -9.4 percent and -37.4 percent, respectively. Overall, all the firms recorded an average decrease in TFP over the period of 2002-2005.

In order to identify a change in scale efficiency, the efficiency change is decomposed further into two subcomponents, namely pure efficiency change and scale efficiency change. The results in Table IV show that pure efficiency and scale efficiency appear to be equally important sources of growth for efficiency change. The Apex CI Tracker Fund recorded the highest progress in pure efficiency in 2002-2003, with an annual growth rate of 319 percent, Mayban Dana Yakin (358.8 percent) in 2003-2004, and HLB CIPSF (114.7 percent) in 2004-2005. By contrast, the highest deterioration in pure efficiency were shown by Mayban Dana Yakin (-77.7 percent) in 2002-2003, OSK-UOB SCO Unit Trust (-68.6 percent) in 2003-2004, and OSK-UOB SCO Unit Trust (-90.2 percent) in 2004-2005.

No.	Firms	2002-2003		2003-2004		2004-2005	
		Pure efficiency	Scale efficiency	Pure efficiency	Scale efficiency	Pure efficiency	Scale efficiency
<i>Islamic Unit Trust</i>							
1	HLG Dana Makmur	0.364	1.212	1.901	1.000	0.832	0.808
2	KL Itikal Fund	0.697	1.000	2.013	1.000	1.177	1.000
3	Mayban Dana Yakin	0.223	1.260	4.588	1.000	0.588	0.808
4	Pacific Dana Aman	0.450	1.130	3.423	1.000	0.584	1.000
5	RHB Islamic Bond Fund	1.672	0.939	0.939	1.033	1.100	1.030
	Geomean	0.532	1.101	2.240	1.007	0.820	0.924
<i>Conventional Unit Trust</i>							
1	Alliance Vision Fund	1.000	1.000	0.971	1.000	0.437	1.000
2	APEX CI Tracker Fund	4.196	1.630	0.789	1.000	1.133	0.808
3	APEX-MG Trust	2.155	1.260	0.494	1.000	1.032	0.606
4	Apex Small-Cap Fund	0.503	1.890	1.899	1.000	0.604	0.808
5	HLB CIPSF	1.190	1.000	0.419	1.000	2.147	0.808
6	HLB CPSF	1.170	1.000	0.943	1.000	2.000	1.000
7	HLB FSF	1.110	1.000	0.878	1.000	1.464	1.000
8	HLB/HLG Blue Chip Fund	0.987	1.000	0.824	1.000	1.882	0.808
9	HLB ITSF	1.164	1.000	0.508	1.000	2.061	1.000
10	HLB Penny Stock Fund	1.004	1.000	0.690	1.000	1.700	0.808
11	HLB TSSF	1.939	1.000	0.552	1.000	1.288	0.808
12	KLCI Tracker Fund	1.109	1.000	1.650	1.000	0.697	1.000
13	Mayban Income Trust Fund	1.345	1.175	0.909	1.001	1.100	1.030
14	Mayban Unit Trust Fund	1.000	0.697	1.000	1.393	0.909	1.030
15	OSK-UOB Equity Trust	1.686	1.130	0.844	1.000	1.105	0.808
16	OSK-UO Kidsave Trust	0.586	1.130	1.531	1.000	1.407	1.000
17	OSK-UO SCO Unit Trust	2.110	1.000	0.314	1.000	0.098	1.000
18	PB Balanced Fund	0.557	1.000	1.786	1.000	1.478	0.808
19	Public Industry Fund	1.497	1.000	0.521	1.000	2.110	0.808
20	Public Small Cap Fund	1.059	1.000	0.900	1.000	1.297	0.808
21	RHB Bond Fund	1.676	0.939	1.000	0.908	1.000	1.172
22	TA Comet Fund	1.250	1.130	0.353	1.000	1.488	0.808
	Geomean	1.225	1.069	0.799	1.011	1.113	0.887
	Overall Geomean	1.050	1.075	0.967	1.010	1.052	0.894

Table IV.
Changes in efficiency
components by unit trust
companies, 2002-2005

Relative to other unit trust firms, the Apex Small-Cap Fund recorded the highest progress in scale efficiency, with an average growth rate of 89 percent per annum in 2002-2003. The Mayban Unit Trust was next with (39.3 percent) in 2003-2004 and the RHB Bond Fund (17.2 percent) in 2004-2005. On the other hand, the Mayban Unit Trust Fund, RHB Bond Fund and Apex MG Trust recorded the highest deterioration in scale efficiency of -30.3 percent in the period 2002-2003, -9.2 percent in the period of 2003-2004, and -39.4 percent in the period of 2004-2005.

Overall, during the entire period of study, 2003-2004 and 2004-2005 are identified as a period of both pure efficiency and scale efficiency deterioration, with average rates -3.3 percent and -10.6 percent, respectively. By contrast, the years 2002-2003 and 2004-2005 recorded pure efficiency improvements with average rates of 5 percent and 5.2 percent, respectively. The periods 2002-2003 and 2003-2004 show scale efficiency improvements with annual rates of 7.5 percent and 1 percent, respectively.

4.4 Industry productivity

Table V summarizes the performance of the Malmquist TFP index of the unit trust industry in Malaysia between 2002 and 2005. On the average, only three unit trust firms recorded positive improvements in their TFP performance, i.e. the APEX CI Tracker Fund (36.7 percent), RHB Islamic Bond Fund (3.2 percent) and Mayban Income Trust Fund (1.2 percent), while the Alliance Vision Fund and OSK-UOB SCO Unit Trust recorded the largest deterioration in TFP with annual rates of -42.8 percent and -70 percent, respectively. Of the five Islamic unit trust companies, only two firms, i.e. the RHB Islamic Bond Fund (the second highest TFP improvement out of 27 firms) and the KL Ittikal Funds, have TFP performances above the industrial average of -16.8 percent at 3.2 percent and -17.5 percent, respectively. In terms of efficiency changes, 16 firms recorded improvements in their annual average growth rates, with the Apex CI Tracker Fund having the highest efficiency growth of 70.3 percent, followed by HLB CPSF (30.2 percent), RHB Islamic Bond Fund (20 percent), RHB Bond Fund (18.8 percent), and KL Ittikal Fund (18.2 percent). The lowest growth rate in efficiency is recorded by the OSK-UOB SCO Unit Trust, with an annual rate of -59.8 percent. Only two Islamic unit trust firms recorded improvements in efficiency above the industrial average of 1.2 percent, i.e. the RHB Islamic Bond Fund (20 percent) and KL Ittikal Fund (18.2 percent).

Finally, the unit trust industry in Malaysia is found to be technically inefficient, with an average rate of -18 percent. The lowest deterioration in technical efficiency was yielded by the Mayban Unit Trust Fund (-10.6 percent), while the OSK-UOB SCO Unit Trust recorded the greatest deterioration (-25.5 percent). Interestingly, three Islamic unit trust companies recorded average deteriorations in technical efficiency lower than the industrial average of -18 percent, i.e. the RHB Islamic Bond Fund (-14 percent), HLG Dana Makmur (-16.2 percent), and Mayban Dana Yakin (-17.9 percent).

Overall, the average industry deterioration of TFP of 17.0 percent is caused mainly by the deterioration in technical change (-18 percent). However, efficiency change recorded a positive contribution of 1.2 percent during the period under review. Furthermore, the efficiency change is caused mainly by pure efficiency (2.2 percent), rather than by scale efficiency (-1 percent). This indicates that the size of the companies negatively affects the unit trust TFP performance. Our finding of substantial regress in technical components suggests that the decline in TFP of the

No.	Firms	Total factor	Efficiency	Technical efficiency	Pure efficiency	Scale efficiency
<i>Islamic Unit Trust</i>						
1	HLG Dana Makmur	0.692	0.826	0.838	0.832	0.993
2	KL Ittikal Fund	0.899	1.182	0.761	1.182	1.000
3	Mayban Dana Yakin	0.698	0.850	0.821	0.845	1.006
4	Pacific Dana Aman	0.786	1.005	0.781	0.965	1.042
5	RHB Islamic Bond Fund	1.032	1.200	0.860	1.200	1.000
	Geomean	0.812	1.000	0.811	0.992	1.008
<i>Conventional Unit Trust</i>						
1	Alliance Vision Fund	0.572	0.751	0.761	0.751	1.000
2	APEX CI Tracker Fund	1.367	1.703	0.803	1.554	1.096
3	APEX-M4 Trust	0.837	0.943	0.887	1.032	0.914
4	Apex Small-Cap Fund	0.826	0.959	0.861	0.832	1.152
5	HLB CIPSF	0.830	0.953	0.871	1.023	0.931
6	HLB CPSF	0.990	1.302	0.761	1.302	1.000
7	HLB FSF	0.916	1.126	0.814	1.126	1.000
8	HLB/HLG Blue Chip Fund	0.934	1.073	0.871	1.152	0.931
9	HLB ITSF	0.869	1.068	0.814	1.068	1.000
10	HLB Penny Stock Fund	0.856	0.984	0.871	1.056	0.931
11	HLB TSSF	0.903	1.037	0.871	1.113	0.931
12	KLCl Tracker Fund	0.825	1.084	0.761	1.084	1.000
13	Mayban Income Trust Fund	1.012	1.177	0.860	1.104	1.066
14	Mayban Unit Trust Fund	0.866	0.969	0.894	0.969	1.000
15	OSK-UOB Equity Trust	0.943	1.128	0.836	1.163	0.970
16	OSK-UOI Kidsave Trust	0.870	1.114	0.781	1.070	1.042
17	OSK-UOI SCO Unit Trust	0.300	0.402	0.745	0.402	1.000
18	PB Balanced Fund	0.862	1.059	0.814	1.137	0.931
19	Public Industry Fund	0.895	1.100	0.814	1.181	0.931
20	Public Small Cap Fund	0.813	1.000	0.814	1.073	0.931
21	RHB Bond Fund	0.910	1.188	0.766	1.188	1.000
22	TA Comet Fund	0.705	0.843	0.836	0.869	0.970
	Geomean	0.834	1.015	0.822	1.029	0.986
	Overall Geomean	0.830	1.012	0.820	1.022	0.990

Conventional
and Islamic unit
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Table V.
Mean summary of
Malmquist TFP Index of
unit trust companies,
2002-2005

unit trust industry in Malaysia is due to a lack of technical innovation. This further suggests that Islamic unit trust companies could improve their productivity through technical innovation.

Figure 2 reports the average changes in TFP and its components. In 2003, Islamic unit trusts performed better than the conventional ones, only in terms of their scale efficiency. The performances of Islamic unit trusts in 2004 improved significantly, compared to the conventional unit trusts, as shown by greater average changes in TFP and its components, i.e. efficiency, technical efficiency and pure efficiency. In this year,

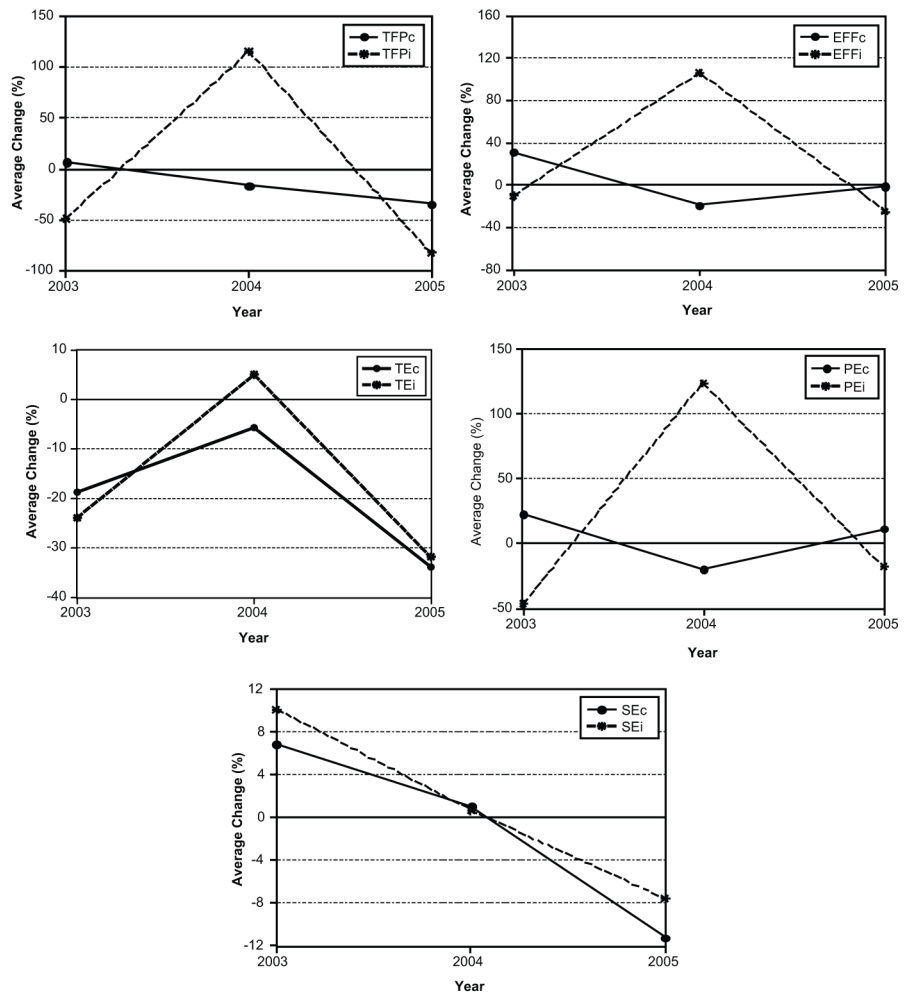


Figure 2.
Changes in mean TFP and its components, 2003-2005

Notes: TFPc, EFFc, TEC, PEc, and SEc refer to the total factor productivity, efficiency, technical efficiency, pure efficiency and scale efficiency of the conventional unit trust firms, while TFPi, EFFi, TEi, PEi, and SEi refer to the total factor productivity, efficiency, technical efficiency, pure efficiency and scale efficiency of the Islamic unit trust firms

only the scale efficiency of conventional unit trusts is found to be marginally higher than their Islamic counterparts. The general performance of the conventional unit trusts continued to decline in 2005, as indicated by the downward trend of their TFP and its components, namely technical efficiency and scale efficiency. Overall, the Islamic unit trusts are found to perform better than their conventional counterparts during the under review period.

5. Conclusion

This paper investigates the efficiency of conventional and Islamic unit trust companies in Malaysia over the period 2002 to 2005. As mentioned earlier, there is a need to compare the efficiency of the conventional and Islamic unit trust companies, since the conventional unit trusts are only subject to potential capital market loss, whereas the Islamic unit trusts are subject to both potential capital market loss and the constraints imposed by the *shari'ah* principles. We would, therefore, expect the performance of these two types of unit trust to differ. The input-output data, consisting of a panel of conventional and Islamic unit trust companies, are analyzed in order to measure the efficiencies of these companies using the DEA approach.

Overall, the efficiency of the Islamic unit trust companies is found to be comparable to their conventional counterparts and, to a certain extent, some of the Islamic unit trust companies were found to be above average in TFP. Two Islamic unit trust companies, namely the RHB Islamic Bond Fund and KL Ittikal Fund recorded TFP performances which were above the industrial average. Two of the five unit trust companies included in our analysis were found to experience improvements in efficiency. In addition, three Islamic unit trust companies, i.e. RHB Islamic Bond Fund, HLG Dana Makmur, and Mayban Dana Yakin recorded average deteriorations in technical efficiency lower than the industry average. These findings should assist the Islamic unit trust companies in improving their technical efficiency, in order to gain a competitive edge over their conventional counterparts.

The results have important implications for both the conventional and Islamic unit trust companies in Malaysia. During the period of analysis, on average, the Malaysian unit trust industry experienced a deterioration of TFP, due mainly to a deterioration in technical efficiency. Efficiency change, however, contributed positively to TFP. In addition, the efficiency change is largely caused by pure efficiency, rather than scale efficiency. This indicates that an increasing size of unit trust company exerts an adverse effect on the TFP performance. Our findings of substantial regress in the technical components and positive growth in efficiency, imply that the deterioration of TFP in the unit trust industry in Malaysia is due to the deficiency of innovation in technical components.

The study is limited to five Islamic unit trust companies and the findings are thus indicative, but inconclusive of the Malaysian unit trust industry as a whole. Since more Islamic unit trust companies have been launched in the country, further comprehensive studies are needed to examine the efficiency of Islamic unit trust companies *vis-à-vis* their conventional counterparts.

Note

1. Data are available upon request from the authors.

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