# IS CAPITAL STRUCTURE STUDY STILL A PUZZLE? SOUTHEAST ASIAN PANEL DATA EVIDENCE

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**Abstract**

Issues on inconclusive results in capital structure studies are still unresolved todate. Various perhaps and justifications being put forward by researchers past and present to rationalize their inconsistent findings. Different leverage definitions used in the studies is identified as one of the main factors that lead to inconsistent results recorded in the literature. Different leverage definition serves differently according to the needs of the study thus produces inconclusive findings. Different models employed also play a significant role in this issue of inconsistencies. Different natures of models employed influence greatly the results in capital structure studies throughout. The three countries selected for this study, Malaysia, Thailand and Singapore prove that inconsistent results reported within each country are due to the different definitions of leverage (six leverage measures used) as well as the different models (the static and dynamic models) employed. Inconsistencies are more rampant in the use of different leverage definitions with the same model as compared to different models with the same leverage definition. The Fixed Effect Model and Partial Adjustment Model are employed representing the static and dynamic models respectively. Therefore, the capital structure studies are still craving for one universally accepted leverage definition and also one appropriate model to satisfy the needs of in depth understanding of the relationship between capital structure decisions and value of a firm.

**Keywords**: Capital Structure Puzzle, Leverage Definitions, Fixed Effect, Partial Adjustment Model

## 1. Introduction

The relationship between capital structure and firm value has been widely studied and analysed theoretically and empirically by researchers past and present. This is because a firm's financing behaviour will consequently affect the value of the firm. In tackling the issue of capital structure, two main questions have to be addressed to, that are, how firms choose their capital structure to finance their operation and how the choice of capital structure financing affects the value of the firm.

Nonetheless, despite the extensive research done on the area of capital structure since Modigliani and Miller in 1958 and ever since Myers (1977) published his article on the determinants of corporate borrowing, understanding in the area is still inconclusive (Harris and Raviv, 1991; Gill *et al*., 2009; Sheikh and Wang, 2011; AnNajjar and Hussainey, 2011;

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Gwatidzo and Ramjee, 2012). Empirical work in this area, according to Titman and Wessels (1988) has lagged behind the theoretical research, perhaps because the relevant firm attributes are expressed in term of fairly abstract concepts that are not directly observable. Deesomsak *et al.* (2004) find that empirical evidence on the effect of determinants on leverage is mixed and inconsistent. A fairly recent work done by Beattie *et al.* (2006) pinned down the same results showing that understanding in the area remains incomplete. They further argued that neither theory is able, independently, to explain the complexity encountered in capital structure practice.

The issue of incompleteness and inconclusiveness of the understanding in the debated area is also reported by Al-Najjar and Taylor (2008). Through their findings, they notice that theoretical explanation is still lacking and empirical results are not yet sufficiently consistent to resolve the capital structure issues on how firms choose between the different methods of financing. Boateng (2004) adds on to the literature, saying that capital structure decision making is even more complicated when it is examined in an international context, particularly in developing countries where markets are characterized by controls and institutional constraints. Margaritis and Psillaki (2009) put forward that corporate financing decisions are quite a complex process and existing theories can at best explain only certain facets of the diversity and complexity of financing choices. Myers (2001) stresses that there is no universal theory of debt-equity choice and no reason to expect one. The reason may be because these theories differ in their emphasis.

Literature has been recording cases of inconclusiveness by researchers past and present with various perhaps as well as rationales made based on their empirical findings. Nevertheless, although this issue of inconsistent sign readings keeps on recurring in the studies of capital structure past and present, no one particular study is specifically done to tackle this unresolved issue. In response to that, this paper intends to look into the issue of inconclusiveness by analysing the impact of the use of different definitions of leverage as well as the use of different models in examining the determinants of leverage. Therefore, three Southeast Asian countries are selected for this study, which are Malaysia, Thailand and Singapore using 790 firms for Malaysian sample, 269 for Thailand and 546 for Singaporean firms. This study uses a 10 year period data from 2000 until 2009. We employed two models, the static model and the dynamic partial adjustment model estimated based on the Fixed Effect Model and the Generalized Method of Moments (GMM) respectively in order to analyse the issue of inconsistent results in the study of capital structure.

To serve the purpose of this study, this paper is organized in such a manner that the following section will briefly lay out the dominant theories behind capital structure study, follows by a section discussing the issue of inconclusiveness in capital structure studies and next is the data and methodology section. The findings of the analysis will be discussed in section 5 and finally a concluding section in section 6.

## 2. Overview of Capital Structure Theories

The most prominent theories of capital structure being studied in the literature explaining firms' financing behaviour are the trade-off, pecking order, agency and market timing theories. Despites the emergence of different feasible capital structure theories, there is still no conclusive guidance for the corporate managers in deciding between debt and equity in financing their operations (Collins and Sekely, 1983; Myers, 1984).

### 2.1 The trade-off theory

The trade-off theory of capital structure states that optimal capital structure can be achieved if the net tax advantage of debt financing balances with leverage related costs. The trade-off of the costs and benefits of borrowing determines the optimal debt ratio. Examples of leverages related costs taken into account in some empirical corporate financing investigations can be found in Scott (1977) where he incorporates bankruptcy costs; agency costs by Jensen and Meckling (1976) and in DeAngelo and Masulis (1980) on loss of non-debt tax shield.

### 2.2 The Pecking Order Theory

The pecking order theory suggests that investments are first financed by internal funds, then external debt, and, as a last resort, external equity (Myers and Majluf, 1984). The pecking order theory is an alternative to the trade-off theory which has emerged based on asymmetric information problems. These asymmetric information problems occur when one party, for example the manager of a firm has better quality information than the other parties, such as outside investors and creditors. In such cases the financing method can serve as a signal to outside investors. Facing information asymmetry between inside and outside investors, firms end up having a financial hierarchy. Equity is issued only when firms have no more debt capacity (Myers, 1984; Myers and Majluf, 1984).

### 2.3 The Agency Theory

The agency theory is based on another problem due to information asymmetry that is the agency problems. Minimizing the costs arising from conflicts between the parties involved can result in the optimal capital structure. Jensen and Meckling (1976) argue that agency costs play an important role in financing decisions due to the conflict that may exist between shareholders and debt holders. The conflict arises when there is moral hazard inside the firm, which is called the agency costs of equity. It is suggested that the use of debt financing can also help in mitigating the agency cost of equity as debts can discipline managers (Jensen, 1986; Stulz, 1990). The optimal capital structure can be achieved by trading off the agency costs, which include the monitoring expenditure by the principal, the bonding expenditure by the agent and the residual loss, against the benefits of debt.

### 2.4 The Market Timing Theory

Baker and Wurgler (2002) propose the market timing theory of capital structure, arguing that current capital structure is the cumulative outcome of past attempts to time the market. In this theory, there is no optimal capital structure and market valuation has a persistent impact on capital structure. However, Leary and Roberts (2005) provide evidence contradicting the implications of market timing theory. They show that the persistent effect of shocks on leverage is more likely due to the presence of adjustment costs than to an indifference towards capital structure.

## 3. Issues of Inconclusiveness in Capital Structure Studies

The issues of inconclusiveness have long been recognised in the studies of capital structure. Ever since Myers (1984) refers studies of capital structures as a puzzle, it still remains unanswered today (AnNajjar and Hussainey, 2011; Gwatidzo and Ramjee, 2012). Various issues have been put forward in explaining this phenomenon throughout the period of capital structure studies. Among the issues discussed are the various definitions of leverage used in capital structure studies and the different models employed in the studies. It is worth to note

that this paper does not intend to investigate in depth the relationships between leverage and firms as well as country specifics factors. Our main objective is to highlight the impact of models employed and different definitions of leverage used in capital structure studies that are found to be responsible in the inconsistent results and inconclusive findings documented throughout the capital structure studies past and present.

**3.1 Definitions of Leverage**

Many different empirical definitions of leverage have been used and opinions on which is a better measure of leverage differ. Referring to past studies, different definitions of leverage produced different results. This observation is supported by Bevan and Danbolt (2002). They find that results are highly dependent upon the precise definition of gearing being examined. Rajan and Zingales (1995) add that the definition of leverage should depend on the objective of the analysis being carried out.

Being the proxy to capital structure, it is crucial to have a clear cut definition of the term leverage. Despites hundreds of capital structure studies have been in the literature, Dissanaike and Markar (2008) state that none has clearly defined what is meant by leverage in accounting terms. An appropriate leverage measure in a country may not be appropriate in another due to institutional and accounting differences between countries. Some leverage measures, according to them, may be more appropriate than others for evaluating particular capital structure theories. For instance, Rajan and Zingales (1995) argue that the debt relative to firm value would be the relevant measure of leverage for study done on agency theory relating to conflicts based on how a firm has been previously financed. Studies related to agency problem would use debt-to-firm value ratio as the definition of leverage. Studies on leverage and financial distress would prefer the interest-coverage ratio as the definition. Other definitions of leverage include total liabilities-to-total assets, debt-to-total assets, debt-to-net assets, and debt-to-capitalization. Debt could also be divided into its various components, and the numerator and denominator could be measured in book value and market value terms. Debt-to-assets (or debt-to-capital) is frequently used as a measure of leverage in empirical studies. Some previous research studies (Titman and Wessels, 1988; Chung, 1993; Pandey *et al*., 2000) also use different measures of leverage.

Another question regarding definition of leverage is whether to use book value of leverage or market value of leverage. Both book value and market value leverage have their own advocates. Being unaffected by volatility of market prices, book value leverage offers a better reflection of the management's target debt ratio. Market value leverage, on the other hand, is unable to reflect the underlying alterations initiated by a firm's decision maker because it is dependent on several factors which are not in direct control of the firm. Book value leverage is referred to as "plug number" (Frank and Goyal, 2009) by those who are in favour of market value leverage because it is used to balance the left hand and right hand sides of the balance sheet rather than a managerially relevant number (Welch, 2004). Welch also argues that book value leverage can take negative values. It is backward looking and it measures what has already taken place. Market value leverage, on the other hand, is forward looking. Realising the differing nature of these two, Frank and Goyal (2009) feel that there is no reason for these two concepts to match thus makes it more unfeasible to solve the puzzle.

It is also recorded in the literature that the use of different leverage definitions has an impact on the results even though the same models are employed in the studies. For example, Bevan and Danbolt (2002), Mukherjee and Mahakud (2010) and Caglayan (2010) have reported on different results derived from the use of different leverage definitions. Arguments put forth above show how highly important the impact of leverage definitions adopted is in

determining and examining both the level of gearing (Rajan and Zingales, 1995; Bevan and Danbolt, 2002) and the determinants of gearing (Chittenden *et al*., 1996; Michaelas *et al*., 1999; Bevan and Danbolt, 2002) as different leverage definitions may yield different results thus leads to inconclusive findings in the capital structure studies.

### 3.2 Different Models Employed

Second is the impact of employing different models in analysing the determinants of capital structure. This phenomenon is also experienced by many researchers past and present. Many earlier studies on the determinants of capital structure decision have tended to concentrate on the static model. Only recently researchers have started to look into the dynamic aspect of capital structure using the dynamic model. In contrast to the static model, (Rasiah and Kim, 2011) state that there are relatively fewer studies on capital structure employing dynamic model. The contrasting nature of these two models is that the static model assumes the observed leverage ratio as being the optimal. Dynamic model, on the other hand, does not assume firms being in equilibrium; rather it relies on a more realistic assumption of partial or incomplete adjustment. Myers and Majluf (1984) suggest that the observed leverage ratio may differ from the optimal level predicted by the static trade-off model between the marginal costs and benefits of debt.

These different beings of the two models have somewhat constituted to the inconclusiveness of capital structure studies. The impact of these two models, the static and the dynamic models on the determinants vary and the results are inconsistent throughout the studies of capital structure past and present. There are cases where different models working with the same leverage definition, inconsistencies in the coefficient signs are recorded. For example, Serrasqueiro and Nunes (2008) encountered different signs of parameter estimation derived from static and dynamic model employed in their studies on the capital structure. They compared between the uses of different estimators on determinants of capital structure of Portuguese companies and recorded different signs of parameter estimates on NDTS, tangibility and growth between the static and dynamic models. Kim et al. (2006) in their studies on capital structure in Korea report that results for growth and NDTS on leverage show differing signs and magnitudes between the static and dynamic models. Banerjee *et al.* (2004) detect significant positive influence of growth on speed of adjustment in their studies on UK firms using static model but significant negative according to dynamic model. A more dramatic conclusion made by, Reinhard and Li (2010) when they study non-financial Indonesian firms, allege that capital structure models, whether static or dynamic, fail to differentiate between trade-off and pecking order theory, thus the debate on which one better explains the financing behaviour of firms is far from over.

These reported findings highlight the notion that different models can lead to inconsistent results on the impact of leverage on factors. Hence, this contributes to the unresolved issue of the inconclusiveness in capital structure studies. Unfortunately, there is no unified model of leverage currently available that can directly account for the factors affecting capital structure decisions (Frank and Goyal, 2009).

## 4. Data and Methodology

### 4.1 Data and Period of Study

This study employs panel data. Firms from the financial sector such as banks, insurance and finance companies are excluded from the samples firms. This is mainly because of the

different accounting categories and rules practiced by these firms. This practice is in line with Rajan and Zingales (1995); Wiwattanakantang (1999); DeMiguel and Pindado (2001) and De Jong *et al.* (2008). Therefore, after excluding these financial firms, the final sample of firms understudy consists of 790 firms for Malaysian sample, 269 for Thailand and 546 for Singaporean firms. This study uses a 10 year period data from 2000 until 2009 where firm level data is sourced from Datastream database while country data from the World Bank database. For observation purposes, only firms with minimum of three consecutive observations towards the end of period understudy are included in the data set (Deesomsak *et al.*, 2009). This means that for this study the firms should at least be listed on the stock exchange from the year 2007. After removing the outliers, the numbers of observation are 6531, 2368 and 4170 for Malaysia, Thailand and Singapore respectively. The following Table 1 presents in detail the structure of the panel data on sample firms for this study.

**Table 1: The Structure of Panel Data**

| No. of Annual | No. of Records on Each Firm | | | No. of Observations | | |
|---|---|---|---|---|---|---|
| Observations for Each Firm | Malaysia | Thailand | Singapore | Malaysia | Thailand | Singapore |
| 3 | 34 | 3 | 34 | 102 | 9 | 102 |
| 4 | 14 | 2 | 35 | 56 | 8 | 140 |
| 5 | 30 | 1 | 16 | 150 | 5 | 80 |
| 6 | 48 | 6 | 52 | 288 | 36 | 312 |
| 7 | 63 | 25 | 61 | 441 | 175 | 427 |
| 8 | 40 | 22 | 51 | 320 | 176 | 408 |
| 9 | 92 | 16 | 50 | 828 | 144 | 450 |
| 10 | 469 | 194 | 247 | 4690 | 1940 | 2470 |
| Total | 790 | 269 | 546 | 6875 | 2493 | 4389 |

Note: 3 annual observations refer to minimum listing period of 2007-2009. (Source: Datastream)

### 4.2 Measures of Leverage

Despite having a vast literature on various studies of capital structure, we realize that there is no clear cut definition of leverage being referred to. Being the proxy to capital structure, it is crucial to have a clear cut definition of the term leverage. Referring to past studies, different definitions of leverage produced different results and no universally accepted definition of leverage exists in the literature (Wanzenried, 2006). In relation to this, basically, there are two questions facing a researcher in defining leverage; which particular leverage ratio to choose and whether to use book value of leverage or market value of leverage.

To define leverage as to cater to the needs of this study, six measures of leverage are used. Following Titman and Wessels (1988), leverage is defined as; the ratio of total debt, long term debt and short term debt to total asset at book value (termed as book value leverage) and to total debt plus total equity at market value (termed as market value leverage). Both market value and book value leverage are incorporated as to observe any inconsistent results as argued by past researchers. However, since the market value of debt is not available, quasi-market leverage will be used, where the book value of equity will be replaced by the market value of equity but debt, in this case, will be valued at its book value. The six measures are also used to check the robustness of the results obtained in this study. Although the strict notion of capital structure refers exclusively to long term debt, short term debt is used in the

definition of leverage because of the significant proportion of short term debt in total debt of firms in the samples of this study.

### 4.3 Explanatory Variables

Most empirical studies on capital structure determinants built on a list of variables likely to affect capital structure choices as suggested by Harris and Raviv (1991) in their theory review: fixed assets, non-debt tax shields, investment opportunities, firm size, earnings volatility, default risk, profitability, advertising expenditures, R&D expenditures, and product uniqueness. Harris and Raviv even suggest that available studies "generally agree" on these determinants, although Titman and Wessels (1988) finds no significant impact of non-debt tax-shields, volatility, collateral value, or future growth on leverage. This ambiguous and contradicting empirical findings on the impact of determinants on leverage can be traced in the literature ever since Modigliani and Miller (1958) period. However, the recent evidence has at least reached consensus on variables influencing capital structure decisions.

We have incorporated thirteen explanatory variables, divided according to firm and country specific to determine the relationship with leverage. Country specific variables are incorporated in this study because firm leverage is also influenced by country specific, not merely firm specific (Demirguc-Kunt and Maksimovic, 1996; De Jong *et al*., 2008; Kayo and Kimura, 2011). Furthermore, a misleading result would be reported if critical country specific differences are ignored (Fan *et al*., 2011). The choices of these determinants are made following those commonly cited in the literature. The selection of variables and proxies used are also according to past literature. The following Table 2 summarizes the explanatory variables and proxies used in the study.

**Table 2: Explanatory Variables and Proxies**

| No | Explanatory Variable | Proxy |
|---|---|---|
| | *Firm Specific* | |
| 1 | Non-Debt Tax Shield | Annual Depreciation Expenses over Total Assets |
| 2 | Tangibility | Net Fixed Asset over Total Asset |
| 3 | Profitability | EBIT over Total Assets |
| 4 | Business Risk | Yearly Change on Firm EBIT |
| 5 | Firm Size | Natural Logarithm of Total Asset |
| 6 | Growth Opportunities | Market Value of Equity to Book Value of Equity |
| 7 | Liquidity | Current Assets over Current Liabilities |
| 8 | Share Price Performance | First Difference of the Year End Share Price |
| | *Country Specific* | |
| 9 | Stock Market Development | Stock Market Capitalization over GDP |
| 10 | Bond Market Development | Total Bond Market Capitalization over GDP |
| 11 | Economic Growth | Annual Percentage Changes in GDP |
| 12 | Interest Rates | Lending Rate |
| 13 | Country Governance | Aggregate Governance Indicators, comprising of six indicators ( voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption) |

### 4.4 Methodology

We employed two models, the static model and dynamic model, to determine the relationship between leverage and explanatory variables and to observe any discrepancies and inconsistent readings derived from the use of the two models. The Fixed Effect Model and Partial Adjustment Model are employed to represent the static and dynamic model respectively.

#### 4.4.1 Fixed Effect Model

The model allows for heterogeneity among firms by allowing each entity to have its own intercept value. The differences across firms in the respective countries may be due to the special features of each firm such as managerial style, managerial philosophy, or the type of market each firm is serving (Gujarati and Porter, 2009). This study hypothesized that leverage is a linear function of a set of *k* explanatory variables and the relationship can be expressed as follows,

$$Y_{it} = \alpha_i + \beta_k X_{kit} + \varepsilon_{it} \qquad (4.1)$$

Since the model allows for heterogeneity among firms by allowing each entity to have its own intercept value, the dummy variables are included as additional regressors to allow for the fixed effect intercept to vary between firms. After adding the dummy variables to equation (4.1), this study obtains,

$$Y_{it} = \sum_{i=1}^{N-1} \alpha_i d_i + \beta_k X_{kit} + \varepsilon_{it} \qquad (4.2)$$

#### 4.4.2 Dynamic Model

Using the framework of partial adjustment model, in which is similar to Jalilvand and Harris (1984); Shyam-Sunder and Myers (1999); DeMiguel and Pindado (2001) and Hovakimian *et al.* (2001), this study assumes that the optimal (target) leverage ratio for a firm is a function of sets of explanatory variables as in Equation (4.3),

$$Y_{it}^{*}=F(X_{it},X_i,X_t) \qquad (4.3)$$

Where $Y_{it}^{*}$ is the optimal leverage ratio of firm *i*, at time *t*, $X_{it}$ is a vector of firm and time variant determinants of the optimal leverage, $X_i$ and $X_t$ are unobservable firm specific and time specific effect which is common to all firms and can change through time.

In a perfectly frictionless world with no adjustment cost, the firm would immediately respond with complete adjustment to variations in the independent variables by varying its existing leverage ratio to equalize its optimal leverage. Thus, at any point in time, the observed leverage of firm *i* at time *t* ($Y_{it}$) should not be different from the optimal leverage, that is, $Y_{it} = Y_{it}^{*}$. This implies that the change in actual leverage from the previous to the current period should be exactly equal to the change required for the firm to be at optimal at time *t*, that is, $Y_{it} - Y_{it-1} = Y_{it}^{*} - Y_{it-1}$. In practice, however, the existence of significant adjustment costs means that the firm will not completely adjust its actual leverage to $Y^{*}$. In other words, only partial adjustment takes place in order to be at optimal leverage and not complete adjustment due to the presence of significant adjustment cost. Thus, with partial adjustment, the firm's observed leverage ratio at any point in time would not equal its optimal leverage ratio. This can be represented by a partial adjustment model as in Equation (4.4).

$$Y_{it}-Y_{it-1}=\delta_{it}(Y_{it}^{*}-Y_{it-1}) \qquad (4.4)$$

Where $\delta_{it}$, is known as the coefficient of adjustment or the speed of adjustment, it is representing the magnitude of desired adjustment between two subsequent periods or the rate of convergence of $Y_{it}$, to its optimal value. The effects of adjustment costs are represented by the restriction that $|\delta_{it}| < 1$, which is a condition that $Y_{it} \rightarrow Y_{it}^{*}$ as $t \rightarrow \infty$. Leverage values that are not at their optimal level will be referred to as sub-optimal. In other words, Equation (4.4) states that the extent to which the desired adjustment depends on its adjustment parameter value. First, if $\delta_{it} = 1$, then the entire adjustment is made within one period and the firm at time *t* is at its target leverage. Since $\delta_{it}$ can vary across firms as well as over time for the same firm, only if $\delta_{it} = 1$ for all *t* shall a firm consistently be at its target leverage. Second, if $\delta_{it} < 1$, then the adjustment from year *t-1* to *t* falls short of the adjustment required to attain the target. Third, if $\delta_{it} > 1$, this means that the firm over-adjusts in the sense that it makes more adjustment than necessary and is still not at the optimal. Since $\delta_{it}$ represents the degree of adjustment per period or the speed of adjustment, a higher $\delta_{it}$ denotes a higher speed of adjustment. Further, the model assumes that the firm's long term target is a linear function of all the explanatory variables that this study has identified earlier. The firm's behaviour can be represented by Equation (4.5) below.

$$Y_{it}^{*} = \sum_{n=1}^{N} \beta_k X_{kit} + \varepsilon_{it} \qquad (4.5)$$

Combining Equation (4.4) and (4.5), we derived,

$$Y_{it} = Y_{it-1} + \delta_{it}(Y_{it}^{*} - Y_{it-1}) \qquad (4.6)$$

$$Y_{it} = Y_{it-1} + \delta_{it} Y_{it}^{*} - \delta_{it} Y_{it-1} \qquad (4.7)$$

$$Y_{it} = (1 - \delta_{it}) Y_{it-1} + \delta_{it} (\sum_{n=1}^{N} \beta_k X_{kit} + \varepsilon_{it}) \qquad (4.8)$$

$$Y_{it}^{*} = (1 - \delta_{it}) Y_{it-1} + \sum_{n=1}^{N} \delta_{it} \beta_k X_{kit} + \delta_{it} \varepsilon_{it} \qquad (4.9)$$

To simplify, Equation (4.9) can also be written as,

$$Y_{it}^{*} = \lambda_0 Y_{it-1} + \sum_{n=1}^{N} \lambda_k X_{kit} + \mu_{it} \qquad (5.0)$$

where $\lambda_0 = 1 - \delta_{it}, \lambda_k = \delta_{it}\beta_k$, and $\delta_{it}\varepsilon_{it} = \mu_{it}$ (where $\mu_{it}$ has the same properties as $\varepsilon_{it}$)

Equation (5.0) above is the dynamic capital structure model of which this study is intended to estimate using the Generalized Method of Moments (GMM) estimation technique, suggested by Arellano and Bond (1991). GMM estimator is designed for situations with "small T, large N" panel data, meaning few time periods and many individual firms (Roodman, 2006). This situation is very much applicable to this study.

## 5. Findings

Inconsistencies in the capital structure issues are still unresolved despites countless studies have been done. This is, as discussed in the earlier section, due to the variations of leverage definitions (Sheikh and Wang, 2011) and also the models used in explaining the impacts of factors on leverage. Responding to the above issue, we will, firstly, compare the signs of the significant determinants derived from the use of the different models, that is the static model and dynamic model according to the same definition of leverage. Following that we will then look into the signs of the significant determinants derived from the use of different definitions of leverage based on the use of the same model. The following Table 3 (different models, same leverage definition) and Table 4 (different leverage definitions, same model) show the summary derived from the regression output (refer Appendix 1 and 2 for details).

### 5.1 Different Models (Same Leverage Definitions)

When comparisons are made on the use of different models (same leverage definitions), it is clearly shown from the table that, despite some similarities in the signs of coefficients, there are cases where, different models yield different signs. For instance, looking at variable tangibility for Malaysia, leverage according to definitions Lev2 (Long Term Debt at Book Value), Lev4 (Total Debt at Market Value) and Lev5 (Long Term Debt at Market Value), the use of static model yields negative relationship in contrast to the positive relationship using the dynamic model. The implication from this is that different signs would lead to different theoretical argument to support the finding. A positive relationship under dynamic model supports the trade-off theory. Since tangible assets of a firm represent real guarantees to its creditors, the importance of those assets among total assets influences the level of debt issued by lenders to firms. Therefore, the greater the proportion of tangible assets on the balance sheet, lenders should be more willing to supply loans and as a result leverage should be higher (see for examples, Harris and Raviv, 1991; Rajan and Zingales 1995, Gaud *et al*., 2005, Sheikh and Wang, 2011). While negative relationship under static model supports the agency theory. According to Titman and Wessels (1988), higher debt level will increase bankruptcy risk thus diminishes the managers' tendency to squander. This is because being highly levered, debtholder will monitor them very closely. To monitor the investment activities of firms with less collateralizable assets is more difficult. This means that the costs associated with this agency relation may be higher relative to firms with high collateralizable assets. This is why, as argued by Titman and Wessels (1988), firms with less collateralizable assets may choose higher debt levels to limit their managers' consumption of perquisites. Other studies also reported negative relationship between tangibilty and leverage (see for examples, Booth *et al*., 2001; Bauer, 2004; Mazur, 2007; Karadeniz *et al*., 2009; Sheikh and Wang, 2011). These valid arguments, looking through contrasting theoretical lenses, further enhance what this paper intends to prove which is, still there is no concrete consensus regarding the influence of factors on leverage, especially when different models are put at work. We can see that fundamental assumptions from these capital structure theories are at work and do influence the overall results of the studies (Kayo and Kimura, 2011).

Referring to Singapore, for variable profitability, leverage by definition Lev3 (Short Term Debt at Book Value) and Lev5 (Long Term debt at Market Value), the static model leads to positive relationship in contrast to the negative relationship using dynamic model. While for variable tangibility, inconsistencies are reported for Lev4 (Total Debt at Market Value) and Lev5 (Long Term Debt at Market Value) in which the static model reported negative relationship in contrast to a positive relationship by the dynamic model. The same is detected for Thailand Lev2 (Long Term Debt at Book Value), for variable share price

performance. Our findings therefore reveal that, results are sensitive to models employed. The different methodology of the two models in examining the impact of factors on leverage lead to different coefficient signs yielded thus making the results not conclusive.

**Table 3: Different Models (Same Leverage Definition)**

MALAYSIA

| Independent Variable | Book Value | | | | | | Market Value | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| | Lev1 | | Lev2 | | Lev3 | | Lev4 | | Lev5 | | Lev6 | |
| NDTS | | | - | - | - | | | | - | - | | |
| Tangibility | - | | - | + | - | | - | + | - | + | - | |
| Profitability | - | - | | - | - | - | | - | | | | - |
| Risk | | | + | | - | | + | | + | | - | |
| Size | - | | + | + | - | | + | + | + | + | + | + |
| Growth | | | + | + | | | - | - | - | | - | - |
| Liquidity | - | | + | | - | - | - | - | + | | - | - |
| SPP | | - | + | | | - | - | - | - | - | - | - |
| Stock | | - | - | | | | + | | | | + | |
| Bond | | + | + | | | | - | | - | | - | |
| Eco Growth | | + | + | | | | - | | - | | - | |
| Interest | | + | | | | | - | | - | | - | |
| Governance | | + | + | | | | - | | - | | - | |

THAILAND

| Independent Variable | Book Value | | | | | | Market Value | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| | Lev1 | | Lev2 | | Lev3 | | Lev4 | | Lev5 | | Lev6 | |
| NDTS | | | | - | - | | + | | | | - | |
| Tangibility | - | | - | | - | - | - | | - | | - | |
| Profitability | | - | | | | - | | - | | - | | - |
| Risk | + | | | | | | + | | - | | | |
| Size | | + | + | | | | + | + | + | + | + | |
| Growth | | | | | | | | | | | | |
| Liquidity | | | | | - | - | | | | | - | |
| SPP | | + | - | + | | - | - | - | | | - | - |
| Stock | - | | - | - | | - | - | - | - | - | - | - |
| Bond | + | | | | | | - | - | - | - | + | |
| Eco Growth | + | + | + | | | + | - | | - | | | |
| Interest | + | | | | | | - | - | - | - | - | |
| Governance | + | + | + | | | | - | - | - | | | |

SINGAPORE

| Independent Variable | Book Value | | | | | | Market Value | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| | Lev1 | | Lev2 | | Lev3 | | Lev4 | | Lev5 | | Lev6 | |
| NDTS | | | | | | | | | | | | |
| Tangibility | | | | | - | - | - | + | - | + | | |
| Profitability | | | | | + | - | | - | + | - | | |
| Risk | | | | | | + | + | | + | | | |
| Size | | | | | - | | + | + | + | + | + | + |
| Growth | | - | | | | | | | | | | |
| Liquidity | - | | | | - | | - | | + | + | - | - |
| SPP | | | | | | | - | - | - | - | - | - |
| Stock | - | | - | | + | | - | - | - | - | - | - |
| Bond | | | | | - | | - | | | + | - | |
| Eco Growth | | | | | | + | - | - | - | | - | - |
| Interest | | | | | | | - | - | - | | - | - |
| Governance | - | | - | | | | + | + | + | | + | + |

Notes: Model FE = Fixed Effect Model (Static Model); GMM = Generalized Method of Moments (Estimator of Dynamic Partial Adjustment Model); Leverage Definitions: Book Value Leverage [Lev1= Total Debt/Total Asset; Lev2=Long Term Debt/Total Asset; Lev3=Short Term Debt/Total Asset]; Market Value Leverage [Lev4= Total Debt/(Total Debt + Total Equity);Lev5=Long Term Debt/(Total Debt + Total Equity); Lev6=Short Term Debt/(Total Debt + Total Equity)

### 5.2 Different Leverage Definitions (Same Model)

Using different leverage definitions could also lead to different results despite employing the same model. As an example, referring to Table 4 above, variable liquidity for Malaysia, based on the static model, we find negative coefficients for Lev1 (Total Debt at Book Value), Lev3 (Short Term Debt at Book Value), lev4 (Total Debt at Market Value) and Lev6 (Short Term Debt at Market Value) in contrast to positive coefficients for Lev2 (Long Term Debt at Book Value) and Lev5 (Long Term Debt at Market Value). Inconsistencies are also detected for bond market development and governance. As for Thailand, inconsistencies are detected on business risk under static model in which leverage defined as Lev1 (Total Debt at Book Value) and Lev4 (Total Debt at Market Value) lead to positive coefficients in contrast to the negative coefficients under Lev5 (Long Term Debt at Market Value). The same is also detected for country specific variables with the exception on stock market development. Inconsistencies are also depicted in our results for Singapore, that is, stock market development and governance. The findings thus conclude that results are sensitive to the various definitions of leverage despite employing the same model. Welch (2010) justifies this phenomenon by claiming that there may not be one best measure (leverage definition) in the capital structure literature as it depends on the question being asked.

**Table 4: Different Leverage Definitions (Same Model)**

MALAYSIA

| Independent Variable | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fixed Effect Model | | | | | | GMM | | | | | |
| NDTS | | - | - | | - | | | - | | | - | |
| Tangibility | - | - | - | - | - | - | | + | | + | + | |
| Profitability | - | | - | | | | - | - | - | - | | - |
| Risk | | + | - | + | + | - | | | | | | |
| Size | - | + | - | + | + | + | | + | | + | + | + |
| Growth | | + | | - | - | - | | + | | - | | - |
| Liquidity | - | + | - | - | + | - | | | - | - | | - |
| SPP | | + | | - | - | - | - | | - | - | - | - |
| Stock | | - | | + | | + | - | | | | | |
| Bond | | + | | - | - | - | + | | | | | |
| Eco Growth | | + | | - | - | - | + | | | | | |
| Interest | | | | - | - | - | + | | | | | |
| Governance | | + | | - | - | - | + | | | | | |

THAILAND

| Independent Variable | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fixed Effect Model | | | | | | GMM | | | | | |
| NDTS | | | - | + | | - | | - | | | | |
| Tangibility | - | - | - | - | - | - | | | - | | | |
| Profitability | | | | | | | - | | - | - | - | - |
| Risk | + | | | + | - | | | | | | | |
| Size | | + | | + | + | + | + | | | + | + | |
| Growth | | | | | | | | | | | | |
| Liquidity | | | - | | | - | | | - | | | |
| SPP | | - | | - | | - | + | + | - | - | | - |
| Stock | - | - | | - | - | - | | - | - | - | - | - |
| Bond | + | | | - | - | + | | | | - | - | |
| Eco Growth | + | + | | - | - | | + | | + | | | |
| Interest | + | | | - | - | - | | | | - | - | |
| Governance | + | + | | - | - | | + | | | - | | |

SINGAPORE

| Independent Variable | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fixed Effect Model | | | | | | GMM | | | | | |
| NDTS | | | | | | | | | | | | |
| Tangibility | | | - | - | - | | | | - | + | + | |
| Profitability | | | + | | + | | | | - | - | - | |
| Risk | | | | + | + | | | | + | | | |
| Size | | | - | + | + | + | | | | + | + | + |
| Growth | | | | | | | - | | | | | |
| Liquidity | - | | - | - | + | - | | | | | + | - |
| SPP | | | | - | - | - | | | | - | - | - |
| Stock | - | - | + | - | - | - | | | | - | - | - |
| Bond | | | - | - | | - | | | | | + | |
| Eco Growth | | | | - | - | - | | | + | - | | - |
| Interest | | | | - | - | - | | | | - | | - |
| Governance | - | - | | + | + | + | | | | + | | + |

Notes: Model FE = Fixed Effect Model (Static Model); GMM = Generalized Method of Moments (Estimator of Dynamic Partial Adjustment Model); Leverage Definitions: Book Value Leverage [Lev1= Total Debt/Total Asset; Lev2=Long Term Debt/Total Asset; Lev3=Short Term Debt/Total Asset]; Market Value Leverage [Lev4= Total Debt/(Total Debt + Total Equity);Lev5=Long Term Debt/(Total Debt + Total Equity); Lev6=Short Term Debt/(Total Debt + Total Equity)

### 5.3 Summary of Inconsistencies

To illustrate even further, a summary of inconsistencies of coefficient signs in relationship between leverage and independent variables are presented in tabular form below. We can see how different models employed working with the same leverage definition yield differing results and also how the same models being put to work with different leverage definitions give different results.

**Table 5: Summary of Inconsistencies of Coefficient Signs in Relationship**

| Model | Definition | Country | Inconsistencies in Coefficient Signs of Variables | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Different | Same | M'sia<br>Thai<br>S'pore | Tang<br>SPP<br>Tang | Profit | | | | | | |
| Same | Different | M'sia<br>Thai<br>S'pore | Size<br>NDTS | Growth<br>Risk<br>Liquid | SPP<br>SPP<br>Stock | Stock<br>Bond<br>Econ | Bond<br>Econ<br>Govern | Econ<br>Interest | Govern<br>Govern | |

Notes: Tang = Tangibility, SPP=Share Price Performance, Profit=Profitability, Size=Firm Size, NDTS= Non-Debt Tax Shield, Growth=Growth Opportunities, Liquid=Liquidity, Stock= Stock Market Development, Bond=Bond Market Development, Econ= Economic Growth, Interest=Interest Rates, Govern=Governance.

Table 5 above shows the summary of the inconsistencies found in the coefficient signs of relationship according to the use of first, different models with the same leverage definition and second, different leverage definitions with the same model employed. From the summary, we can emphasize that inconsistencies are more rampant in the use of different leverage definitions with the same model employed as compared to different models with the same leverage definition. To our knowledge, no study has really highlighted this interesting evidence and we see the dire needs to further investigate this finding. Since no one universal leverage definition is there in the literature so far (Wanzenried 2006), this scene is expected to be repeated in the studies of capital structure. This scenario would consequently lead to the unresolved issue of inconclusive findings on the capital structure study. The findings of this study enhance and reinforce what has been put forward by AnNajjar and Hussainey, (2011) that the effect of the different definitions of (leverage) that can be used by different studies may complicate or even flaw any comparisons of findings made between studies done past and present.

## 6. Conclusion

Tremendous researches being done, nevertheless one concrete and conclusive answer is yet to be put forward in the studies of capital structure. There is still no single answer to the question of what is the perfect debt to equity ratio for a firm to finance its operations and potential investments that would eventually maximise firm value. Inconclusiveness is still an issue in capital structure studies to date. The question of ''how do firms choose their capital structures?' posed by Myers (1984, p 575) remains unanswered.

Our study based on data of the three Southeast Asian countries namely Malaysia, Thailand and Singapore derived to the same conclusion that capital structure is still a puzzle because there is still no clear explanation theoretically and empirically of how firms within each country choose between the different methods of financing. What is clear is that theoretical puzzles still remain and that empirical results are not yet sufficiently consistent to resolve them (An-Najjar and Taylor, 2008). Our study finds that the different leverage definitions being used in capital structure studies throughout the years have their significant impact on the inconsistent results derived from the analysis. Bevan and Danbolt (2002) argue that different definition of leverage gives different results and proved by the evidence, this study agrees to this notion put forward by them, thus confirms the notion that capital structure study is still inconclusive to date.

Employing different models is also identified as another contributing factor of inconclusiveness in capital structure studies. The contrasting nature of the static and dynamic models influence the results of findings where each model yields different coefficient sign thus leads to different theoretical argument underlying it. Banerjee *et al.* (2004) and Serrasqueiro and Nunes (2008) also encounter similar scenario when employing different models in their studies. Thus, the findings from this study support the argument that different models employed, though with same leverage definitions will lead to inconclusiveness in capital structure studies.

Evidence is more rampant when different leverage definitions are put to work with the same model. This study proves this notion that when the same model is working with different leverage definitions different signs are yielded hence inconsistent results are recorded.

Although being debated and studied for decades studies on capital structure still represent one of the main unsolved issues in the corporate finance literature. Countless theoretical studies as well as empirical research have tried to attend to these issues, still no one theory stands out to explain accurately the corporate financing behaviour of firms past and present. Indeed, what makes the capital structure debate so exciting is that only a few of the developed theories have been tested by empirical studies and the theories themselves lead to different, not mutually exclusive and sometimes opposed, results and conclusions (Gill *et al*., 2009). And we would conclude this study by agreeing that what appears to be witnessed by the literature is that empirical evidence indicates that the capital structure choice lies at the very heart of corporate financial decision making (Drobetz and Wanzenried, 2006).

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## APPENDIX 1-MALAYSIA

Fixed Effect Model Estimation

**MALAYSIA** (N=6531)

| Independent Variable | Book Value | | | Market Value | | |
|---|---|---|---|---|---|---|
| | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
| C | 3.5804 | -1.3376*** | 2.5219 | 3.5167*** | 0.3863 | 8.9290*** |
| | [0.4149] | [-4.0925] | [0.3157] | [3.5941] | [0.5355] | [2.7911] |
| NDTS | -1.0257 | -0.1850* | -1.2104** | 0.0205 | -0.2710* | -0.2210 |
| | [-0.9952] | [-1.7955] | [-2.1539] | [0.0646] | [-1.7387] | [-0.2829] |
| TANG | -0.3583*** | -0.0854*** | -0.3754*** | -0.0706*** | -0.0263*** | -0.0658* |
| | [-11.0092] | [-14.5344] | [-7.4471] | [-3.8272] | [-3.2349] | [-1.7877] |
| PROFIT | -0.0002*** | 0.0000 | -0.0002** | 0.0001 | 0.0001 | 0.0002 |
| | [-8.7925] | [0.9227] | [-2.2787] | [0.5520] | [1.1682] | [1.0195] |
| RISK | 0.0145 | 0.0944*** | -0.1879*** | 0.1611*** | 0.1662*** | -0.2141*** |
| | [0.2469] | [5.0679] | [-2.7734] | [3.9608] | [7.3750] | [-2.4614] |
| SIZE | -0.2202*** | 0.0539*** | -0.2592** | 0.1116*** | 0.0857*** | 0.0851* |
| | [-3.0626] | [7.1281] | [-2.0525] | [5.2649] | [8.6558] | [1.8180] |
| GROWTH | -0.0025 | 0.0016*** | -0.0080 | -0.0067** | -0.0035** | -0.0233** |
| | [-0.8154] | [3.1361] | [-1.5702] | [-2.0983] | [-2.0790] | [-2.3182] |
| LIQUIDITY | -0.0012*** | 0.0005* | -0.0027*** | -0.0008*** | 0.0006** | -0.0041** |
| | [-2.7254] | [1.6359] | [-3.1311] | [-3.7192] | [2.1970] | [-2.4109] |
| SPP | -0.0064 | 0.0024** | -0.0147 | -0.0178*** | -0.0034** | -0.0361*** |
| | [-0.6903] | [2.1686] | [-1.0877] | [-2.6079] | [-2.1926] | [-5.9762] |
| STOCK MKT | 0.0001 | -0.0004** | -0.0009 | 0.0021*** | 0.0005 | 0.0049*** |
| | [0.0152] | [-2.0984] | [-0.2261] | [4.2992] | [1.4290] | [2.9571] |
| BOND MKT | -0.3893 | 0.5285** | 0.7442 | -3.4075*** | -0.9875** | -6.7875*** |
| | [-0.0662] | [2.1980] | [0.1608] | [-5.8919] | [-2.2197] | [-3.5204] |
| ECON | -0.0039 | 0.0194** | 0.0379 | -0.1224*** | -0.0352** | -0.2497*** |
| | [-0.0196] | [2.3749] | [0.2343] | [-6.1445] | [-2.3496] | [-3.6832] |
| INT | -0.0023 | 0.0155 | 0.0595 | -0.0988*** | -0.0361** | -0.2210*** |
| | [-0.0100] | [1.4337] | [0.3106] | [-3.9745] | [-1.9026] | [-2.6800] |
| GOV | -0.2712 | 0.2972** | 0.3648 | -1.5772*** | -0.4409* | -3.4573*** |
| | [-0.0889] | [2.2194] | [0.1458] | [-5.0898] | [-1.8438] | [-3.2947] |
| R-sq | 0.6332 | 0.7939 | 0.7074 | 0.8926 | 0.7881 | 0.6664 |
| Adj-R sq | 0.5414 | 0.7424 | 0.6341 | 0.8658 | 0.7351 | 0.5829 |
| F-stat | 6.8982*** | 15.3959*** | 9.6527*** | 33.2189*** | 14.8628*** | 7.9765*** |
| DW | 1.2951 | 2.0912 | 1.9813 | 1.8811 | 2.0236 | 1.6773 |
| Wald (Joint) $\chi^2$ | 55.1233*** | 32.6974*** | 89.6730*** | 182.8504*** | 43.8925*** | 71.9218*** |
| AR(1) | 0.3044 | 0.4344*** | 0.5686** | 0.5116*** | 0.3783*** | 0.1538 |
| | [0.9129] | [3.9260] | [1.9258] | [9.3009] | [4.1173] | [1.1718] |

Notes: ***, **, * denotes significant at 1%, 5%, 10% respectively. The heteroskedastic effects are corrected using the White's Heteroscedasticity-Corrected Standard Errors; *t*-statistics in parentheses are the *t*-values adjusted for White's heteroscedasticity consistent standard errors; Wald test statistic refers to the null hypothesis that all coefficients on the determinants of leverage are jointly equal zero.

## APPENDIX 1-THAILAND
Fixed Effect Model Estimation

**THAILAND** (N=2368)

| Independent | Book Value | | | Market Value | | |
|---|---|---|---|---|---|---|
| Variable | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
| C | -0.4914 | -0.0073 | 0.3814 | -1.4212*** | -0.1365 | -1.9997*** |
| | [-0.5153] | [-0.0677] | [0.3401] | [-2.6125] | [-0.6483] | [-3.0549] |
| NDTS | -0.0477 | -0.1514 | -0.5977*** | 0.5559*** | 0.1718 | -1.3791* |
| | [-0.1689] | [-1.1035] | [-3.6517] | [2.7466] | [0.7876] | [-1.7164] |
| TANG | -0.1944*** | -0.0108* | -0.5080*** | -0.2543*** | -0.0656** | -0.4478*** |
| | [-7.2601] | [-1.6188] | [-4.3592] | [-4.7321] | [-2.0408] | [-3.3586] |
| PROFIT | 0.0001 | 0.0000 | 0.0001 | -0.0002 | 0.0000 | -0.0002 |
| | [1.2237] | [1.2656] | [0.6019] | [-1.4599] | [0.3974] | [-1.0211] |
| RISK | 0.0108* | 0.0008 | -0.0130 | 0.0090* | -0.0104** | 0.0059 |
| | [1.8524] | [0.5132] | [-1.2671] | [1.7657] | [-2.3821] | [1.0839] |
| SIZE | 0.0440 | 0.0109* | -0.0079 | 0.1381*** | 0.0374*** | 0.1610*** |
| | [0.7088] | [1.6046] | [-0.1092] | [3.9032] | [2.9956] | [3.5932] |
| GROWTH | 0.0002 | 0.0000 | 0.0002 | 0.0002 | 0.0000 | 0.0001 |
| | [0.8999] | [0.0575] | [1.2077] | [0.6458] | [-0.0714] | [0.1222] |
| LIQUIDITY | -0.0018 | 0.0005 | -0.0070*** | -0.0018 | 0.0007 | -0.0069** |
| | [-1.1807] | [1.4061] | [-4.3026] | [-1.1394] | [1.5662] | [-2.2609] |
| SPP | -0.0001 | -0.0001*** | 0.0000 | -0.0003* | 0.0000 | -0.0004* |
| | [-1.2222] | [-3.7337] | [-0.4374] | [-1.8153] | [-1.0042] | [-1.7003] |
| STOCK MKT | -0.0004*** | -0.0002*** | -0.0001 | -0.0015*** | -0.0008*** | -0.0025*** |
| | [-7.3662] | [-4.3336] | [-0.6048] | [-17.5463] | [-10.3942] | [-16.4279] |
| BOND MKT | 0.1287** | -0.0445 | 0.2155 | -0.3499*** | -0.3387*** | 0.7210*** |
| | [2.3076] | [-0.7710] | [1.6483] | [-4.0510] | [-5.6802] | [2.9791] |
| ECON | 0.0096*** | 0.0035** | 0.0071 | -0.0116*** | -0.0088*** | 0.0023 |
| | [6.4293] | [2.2412] | [1.4872] | [-4.4564] | [-4.8098] | [0.3335] |
| INT | 0.0040** | -0.0005 | 0.0015 | -0.0137*** | -0.0085*** | -0.0165*** |
| | [2.3602] | [-0.5611] | [1.0183] | [-9.5213] | [-7.0551] | [-6.3086] |
| GOV | 0.1031*** | 0.0855*** | -0.0334 | -0.1163*** | -0.0449** | 0.0029 |
| | [8.0105] | [4.5181] | [-0.7407] | [-4.8366] | [-2.3156] | [0.0453] |
| R-sq | 0.8807 | 0.8686 | 0.7990 | 0.8746 | 0.8212 | 0.8209 |
| Adj-R sq | 0.8499 | 0.8347 | 0.7471 | 0.8422 | 0.7751 | 0.7747 |
| F-stat | 28.6133*** | 25.6194*** | 15.4033*** | 27.0260*** | 17.8055*** | 17.7687*** |
| DW | 1.9400 | 2.0319 | 1.8395 | 1.8550 | 1.9487 | 1.9011 |
| Wald (Joint) $\chi^2$ | 124.6948*** | 48.1047*** | 154.1371*** | 191.9180*** | 68.1000*** | 110.1685*** |
| AR(1) | 0.5783*** | 0.5185*** | 0.3477*** | 0.3683*** | 0.2672*** | 0.3283* |
| | [5.9804] | [5.1441] | [4.5391] | [3.6528] | [4.1900] | [1.8080] |

Notes: ***, **, * denotes significant at 1%, 5%, 10% respectively. The heteroskedastic effects are corrected using the White's Heteroscedasticity-Corrected Standard Errors; *t*-statistics in parentheses are the *t*-values adjusted for White's heteroscedasticity consistent standard errors; Wald test statistic refers to the null hypothesis that all coefficients on the determinants of leverage are jointly equal zero.

## APPENDIX 1-SINGAPORE
Fixed Effect Model Estimation

**SINGAPORE** (N=4170)

| Independent | Book Value | | | Market Value | | |
|---|---|---|---|---|---|---|
| Variable | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
| C | 9.1949 | 1.3210 | 8.5466 | 24.4507*** | 3.6447*** | 51.7788*** |
| | [0.9927] | [0.3132] | [1.1941] | [13.7553] | [4.4648] | [7.1328] |
| NDTS | -4.0197 | -1.4647 | -2.5416 | 0.0533 | -0.0787 | -0.0865 |
| | [-0.8116] | [-0.7042] | [-1.4541] | [0.2060] | [-0.4574] | [-0.0981] |
| TANG | -0.9748 | -0.3662 | -0.9312*** | -0.0555*** | -0.0219*** | -0.0597 |
| | [-1.4012] | [-1.2234] | [-3.7107] | [-4.7717] | [-2.9278] | [-1.1610] |
| PROFIT | 0.0006 | 0.0002 | 0.0005* | 0.0000 | 0.0000** | 0.0001 |
| | [1.1485] | [1.1717] | [1.7800] | [-0.1185] | [-2.4448] | [0.2930] |
| RISK | -0.4044 | -0.0547 | -0.7884 | 0.2742*** | 0.2611*** | -0.0400 |
| | [-0.7530] | [-0.2511] | [-1.4588] | [5.2354] | [6.6008] | [-0.7322] |
| SIZE | -0.1742 | -0.0447 | -0.4186*** | 0.1127*** | 0.0599*** | 0.0726** |
| | [-0.8781] | [-0.4988] | [-2.9697] | [11.9771] | [6.3787] | [2.1399] |
| GROWTH | -0.0053 | -0.0016 | -0.0050 | -0.0007 | 0.0002 | -0.0024 |
| | [-1.5642] | [-1.1400] | [-1.5366] | [-1.0612] | [0.7735] | [-1.0551] |
| LIQUIDITY | -0.0105** | 0.0004 | -0.0229*** | -0.0032** | 0.0035** | -0.0151*** |
| | [-2.1523] | [0.1533] | [-4.7265] | [-2.3833] | [2.2445] | [-7.5352] |
| SPP | 0.0183 | 0.0098 | -0.0151 | -0.0199*** | -0.0064*** | -0.0452*** |
| | [0.7823] | [0.8310] | [-0.7896] | [-4.8727] | [-2.8590] | [-6.5667] |
| STOCK MKT | -0.0009** | -0.0003* | 0.0005* | -0.0006*** | -0.0002*** | -0.0012*** |
| | [-2.0833] | [-1.6603] | [1.6695] | [-4.2082] | [-3.2404] | [-4.7256] |
| BOND MKT | -0.0591 | 0.2509 | -2.4879** | -4.0766*** | -0.2778 | -7.2780** |
| | [-0.0814] | [0.8385] | [-1.8513] | [-5.7864] | [-1.4376] | [-2.3260] |
| ECON | 0.0016 | 0.0031 | -0.0043 | -0.0278*** | -0.0049*** | -0.0557*** |
| | [0.2632] | [1.1773] | [-0.6445] | [-19.4063] | [-10.9214] | [-6.1265] |
| INT | -0.9625 | 0.0015 | -0.1433 | -4.5324*** | -0.8066*** | -9.3830*** |
| | [-0.4493] | [0.0016] | [-0.0894] | [-11.7421] | [-4.7630] | [-8.6734] |
| GOV | -0.7576* | -0.4538** | -0.3282 | 0.6948*** | 0.1071** | 1.6479*** |
| | [-1.6578] | [-2.2302] | [-0.9466] | [5.8672] | [2.2018] | [15.8147] |
| R-sq | 0.4009 | 0.4093 | 0.5230 | 0.8415 | 0.7414 | 0.7037 |
| Adj-R sq | 0.2262 | 0.2371 | 0.3842 | 0.7952 | 0.6660 | 0.6175 |
| F-stat | 2.2945*** | 2.3762*** | 3.7683*** | 18.1992*** | 9.8329*** | 8.1630*** |
| DW | 2.4097 | 2.4318 | 2.2675 | 1.9594 | 2.1563 | 1.9703 |
| Wald (Joint) $\chi^2$ | 17.7048*** | 11.6711*** | 40.2523*** | 57.4148*** | 22.9741*** | 25.7757*** |
| AR(1) | 0.1044 | 0.0753 | 0.2082 | 0.4894*** | 0.2631** | 0.3548** |
| | [0.6282] | [0.4617] | [0.9886] | [5.1062] | [2.1060] | [1.9658] |

Notes: ***, **, * denotes significant at 1%, 5%, 10% respectively. The heteroskedastic effects are corrected using the White's Heteroscedasticity-Corrected Standard Errors; *t*-statistics in parentheses are the *t*-values adjusted for White's heteroscedasticity consistent standard errors; Wald test statistic refers to the null hypothesis that all coefficients on the determinants of leverage are jointly equal zero.

## APPENDIX 2-MALAYSIA

Generalized Method of Moments (GMM) - First Difference Estimation

**MALAYSIA** (N=6531)

| Independent Variable | Book Value | | | Market Value | | |
|---|---|---|---|---|---|---|
| | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
| Lev(-1) | 0.4300*** | 0.6534*** | 0.4389*** | 0.4612*** | 0.5746*** | 0.0266** |
| | [7.8788] | [5.5707] | [4.5856] | [7.1235] | [7.4328] | [2.1854] |
| NDTS | -0.7179 | -0.4923*** | 0.0975 | -0.3297 | -0.5387*** | -0.0373 |
| | [-0.6322] | [-2.7282] | [0.1060] | [-1.1790] | [-2.4543] | [-0.0405] |
| TANG | 0.1150 | 0.0688* | -0.1010 | 0.1680*** | 0.1507*** | -0.0892 |
| | [1.5529] | [1.8941] | [-0.9452] | [4.8934] | [4.2689] | [-1.1896] |
| PROFIT | -0.4232*** | -0.0834*** | -0.4823*** | -0.0793*** | -0.0016 | -0.0792** |
| | [-11.01] | [-3.5405] | [-10.2294] | [-2.7688] | [-0.0961] | [-2.0701] |
| RISK | -0.0004 | 0.0001 | -0.0005 | -0.0001 | 0.0001 | 0.0002 |
| | [-1.0980] | [0.9090] | [-1.5394] | [-0.4043] | [0.8364] | [1.3152] |
| SIZE | -0.1727 | 0.0305** | -0.2436 | 0.1297*** | 0.0712*** | 0.1841** |
| | [-1.0964] | [2.8189] | [-1.3320] | [5.7611] | [4.0846] | [2.0572] |
| GROWTH | -0.0017 | 0.0032* | -0.0062 | -0.0038** | -0.0010 | -0.0164** |
| | [-0.8452] | [1.7537] | [-1.2980] | [-2.3030] | [-0.5018] | [-2.4303] |
| LIQUIDITY | -0.0015 | 0.0004 | -0.0041** | -0.0010*** | 0.0006 | -0.0038** |
| | [-1.3430] | [0.8534] | [-2.0019] | [-3.8293] | [1.0197] | [-2.1855] |
| SPP | -0.0196** | 0.0024 | -0.0320*** | -0.0264*** | -0.0057** | -0.0402*** |
| | [-2.1222] | [0.8944] | [-3.6920] | [-4.2949] | [-2.0051] | [-4.3232] |
| STOCK MKT | -0.0062* | -0.0016 | -0.0101 | -0.0005 | -0.0017 | -0.0039 |
| | [-1.8973] | [-1.5087] | [-1.2307] | [-0.3967] | [-1.2038] | [-0.5368] |
| BOND MKT | 7.5830* | 1.8765 | 12.0634 | -0.4220 | 1.5563 | 3.5717 |
| | [1.9091] | [1.4576] | [1.2348] | [-0.2576] | [0.9296] | [0.4035] |
| ECON | 0.2638** | 0.0665 | 0.4152 | -0.0172 | 0.0539 | 0.0995 |
| | [1.9811] | [1.5665] | [1.2575] | [-0.3147] | [0.9621] | [0.3387] |
| INT | 0.3025* | 0.0664 | 0.5377 | -0.0039 | 0.0505 | 0.2432 |
| | [1.8147] | [1.2211] | [1.2949] | [-0.0561] | [0.7144] | [0.6489] |
| GOV | 3.7165* | 0.9697 | 6.0991 | -0.0292 | 0.8554 | 1.9729 |
| | [1.8476] | [1.4615] | [1.2340] | [-0.0345] | [0.9815] | [0.4294] |
| 1st Order Cor. | -0.3887*** | -0.1950*** | -0.2561*** | -0.2427*** | -0.3718*** | -0.2632*** |
| 2nd Order Cor. | 0.0207 | 0.3901*** | -0.1761*** | 0.1039*** | -0.0470*** | 0.0155 |
| Wald (joint)$\chi^2$ | 63.3091*** | 569.4434*** | 508.4449*** | 647.2911*** | 248.0277*** | 78.9032*** |
| *J*-Statistic | 24.5782 | 130.3220*** | 85.6978*** | 151.3819*** | 131.0562*** | 20.1826 |

Notes: Each variable is in its first difference form. ***, **, * denotes significant at 1%, 5%, 10% level respectively. The *t*-statistics in parentheses are the *t*-values adjusted for White's heteroscedasticity consistent standard errors; (1) Wald test statistic refers to the null hypothesis that all coefficients on the determinants of the target debt ratio are jointly equal zero. (2) Second order correlation refers to the null of no second order correlation in the residuals. (3) The *J* test statistic for the null that the over identifying restrictions are valid.

## APPENDIX 2-THAILAND

Generalized Method of Moments (GMM) - First Difference Estimation

**THAILAND** (N=2368)

| Independent Variable | Book Value | | | Market Value | | |
|---|---|---|---|---|---|---|
| | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
| Lev(-1) | 0.7196*** | 0.6937*** | 0.3298** | 0.3590*** | 0.3193*** | 0.0573 |
| | [5.9748] | [5.4157] | [2.3259] | [5.6137] | [4.2039] | [0.3932] |
| NDTS | -0.3102 | -0.3609** | -0.4755 | 0.0073 | -0.1967 | -0.8172 |
| | [-0.7532] | [-2.2800] | [-1.5124] | [0.0211] | [-1.1588] | [-0.5966] |
| TANG | 0.0128 | -0.0001 | -0.0204* | 0.0145 | -0.0030 | 0.0096 |
| | [0.9185] | [-0.0139] | [-1.8205] | [1.1371] | [-0.4366] | [0.4607] |
| PROFIT | -0.3654*** | -0.1481 | -0.3979*** | -0.2301*** | -0.0487* | -0.2772*** |
| | [-3.2063] | [-1.5370] | [-3.6386] | [-3.4467] | [-1.7292] | [-3.0575] |
| RISK | 0.0001 | 0.0001 | 0.0000 | -0.0002 | 0.0001 | -0.0002 |
| | [0.4936] | [1.2758] | [0.0722] | [-1.1258] | [0.6607] | [-0.7604] |
| SIZE | 0.1266*** | 0.0289 | 0.0434 | 0.1730*** | 0.0453*** | 0.1339 |
| | [2.6368] | [1.4771] | [0.5992] | [4.7098] | [2.5255] | [1.5537] |
| GROWTH | 0.0001 | -0.0003 | 0.0002 | 0.0001 | -0.0003 | 0.0004 |
| | [0.3356] | [-1.0837] | [1.1680] | [0.3905] | [-1.3168] | [1.1140] |
| LIQUIDITY | -0.0010 | 0.0026 | -0.0068* | -0.0014 | 0.0023 | -0.0057 |
| | [-0.7397] | [1.2322] | [-1.8012] | [-0.9719] | [1.5258] | [-1.5136] |
| SPP | 0.0002*** | 0.0000*** | 0.0002** | -0.0005*** | 0.0000 | -0.0005*** |
| | [3.0442] | [-2.5281] | [2.1143] | [-7.2677] | [-1.1132] | [-4.2557] |
| STOCK MKT | -0.0006 | -0.0005* | -0.0007** | -0.0024*** | -0.0014*** | -0.0038*** |
| | [-1.5446] | [-1.6140] | [-1.9535] | [-6.4283] | [-3.7503] | [-5.1933] |
| BOND MKT | 0.3501 | 0.1724 | 0.2725 | -0.5516** | -0.3915* | 0.6404 |
| | [1.5806] | [0.7648] | [1.1073] | [-2.3518] | [-1.6845] | [1.3143] |
| ECON | 0.0149* | 0.0092 | 0.0120* | -0.0035 | -0.0018 | 0.0108 |
| | [1.8005] | [1.2860] | [1.6605] | [-0.4163] | [-0.2557] | [0.8882] |
| INT | 0.0054 | -0.0022 | 0.0037 | -0.0321*** | -0.0184*** | -0.0045 |
| | [0.8662] | [-0.3795] | [0.5561] | [-3.8234] | [-2.5288] | [-0.3192] |
| GOV | 0.1711** | 0.1157 | -0.0108 | -0.2213*** | -0.0926 | -0.0146 |
| | [2.2914] | [1.4910] | [-0.1277] | [-2.4538] | [-1.0351] | [-0.1014] |
| 1st Order Cor. | -0.2363*** | -0.3063*** | -0.1699*** | -0.2850*** | -0.3208*** | -0.1035*** |
| 2nd Order Cor. | -0.0659** | 0.0029 | 0.0262 | 0.0413 | 0.0250 | 0.0116 |
| Wald (joint) $\chi^2$ | 90.7645*** | 177.3935*** | 154.7685*** | 424.5110*** | 159.6277*** | 438.1869*** |
| *J*-Statistic | 60.4067*** | 28.8222 | 33.1122 | 32.2300 | 122.3711*** | 276.0285*** |

Notes: Each variable is in its first difference form. ***, **, * denotes significant at 1%, 5%, 10% level respectively. The *t*-statistics in parentheses are the *t*-values adjusted for White's heteroscedasticity consistent standard errors; (1) Wald test statistic refers to the null hypothesis that all coefficients on the determinants of the target debt ratio are jointly equal zero. (2) Second order correlation refers to the null of no second order correlation in the residuals. (3) The *J* test statistic for the null that the over identifying restrictions are valid.

## APPENDIX 2-SINGAPORE

Generalized Method of Moments (GMM) - First Difference Estimation

**SINGAPORE** (N=4170)

| Independent Variable | Book Value | | | Market Value | | |
|---|---|---|---|---|---|---|
| | Lev1 | Lev2 | Lev3 | Lev4 | Lev5 | Lev6 |
| Lev(-1) | 0.3454 | 0.5270 | 0.6918*** | 0.3052*** | 0.4039*** | 0.3008*** |
| | [0.8044] | [1.1339] | [2.5904] | [11.8288] | [7.4044] | [8.1106] |
| NDTS | -5.8855 | -3.0082 | -5.3965 | -0.2826 | -0.0108 | -0.9329 |
| | [-0.9953] | [-0.9733] | [-1.3169] | [-1.2728] | [-0.0591] | [-0.7647] |
| TANG | -0.6876 | -0.1843 | -1.1271* | 0.2352*** | 0.2234*** | -0.0957 |
| | [-0.9046] | [-0.5146] | [-1.8229] | [6.1463] | [4.5239] | [-0.8083] |
| PROFIT | -1.7150 | -0.8326 | -2.0886*** | -0.0706*** | -0.0240*** | -0.0958 |
| | [-1.3097] | [-1.3048] | [-3.7777] | [-4.1715] | [-5.6534] | [-1.4874] |
| RISK | 0.0009 | 0.0005 | 0.0008* | 0.0000 | 0.0000 | 0.0000 |
| | [1.2640] | [1.3396] | [1.5796] | [-0.3842] | [0.0254] | [-0.2883] |
| SIZE | 0.0789 | 0.0349 | -0.0807 | 0.1232*** | 0.0659*** | 0.1259** |
| | [1.1623] | [0.8786] | [-0.4191] | [9.2876] | [6.5647] | [1.9711] |
| GROWTH | -0.0034** | 0.0012 | -0.0022 | 0.0000 | 0.0004 | -0.0010 |
| | [-2.0927] | [0.9080] | [-0.9376] | [-0.0634] | [1.1490] | [-0.8535] |
| LIQUIDITY | -0.0051 | 0.0028 | -0.0091 | -0.0014 | 0.0039** | -0.0120*** |
| | [-1.0159] | [1.4509] | [-1.0592] | [-1.1693] | [2.2733] | [-2.9616] |
| SPP | 0.0147 | 0.0104 | -0.0492 | -0.0279*** | -0.0094*** | -0.0669*** |
| | [0.9056] | [1.0715] | [-1.0174] | [-4.1423] | [-4.6083] | [-3.2456] |
| STOCK MKT | -0.0014 | -0.0006 | 0.0006 | -0.0009*** | -0.0002* | -0.0016*** |
| | [-1.5178] | [-1.2665] | [0.4674] | [-6.8487] | [-1.7539] | [-4.6258] |
| BOND MKT | 1.9099 | 1.0339 | 1.7225 | 0.0444 | 0.3285* | -0.0757 |
| | [1.3327] | [1.5219] | [1.0908] | [0.1958] | [1.7110] | [-0.0739] |
| ECON | 0.0073 | 0.0047 | 0.0144** | -0.0091*** | -0.0011 | -0.0194*** |
| | [1.2228] | [1.4980] | [2.1068] | [-6.2196] | [-0.8399] | [-5.3424] |
| INT | -2.0019 | -0.5685 | 1.7688 | -2.3174*** | -0.1495 | -4.8777*** |
| | [-1.3618] | [-0.6779] | [0.6714] | [-7.2920] | [-0.6160] | [-6.1346] |
| GOV | -0.7154 | -0.4857 | -0.4586 | 0.8113*** | 0.0727 | 1.7481*** |
| | [-0.9140] | [-1.2720] | [-0.7580] | [7.8353] | [0.9208] | [6.4559] |
| 1st Order Cor. | -0.2885*** | -0.3591*** | -0.3274*** | -0.2976*** | -0.3313*** | -0.3747*** |
| 2nd Order Cor. | -0.1834*** | -0.1014*** | -0.1393*** | 0.0232 | 0.0019 | 0.0580*** |
| Wald (joint)$\chi^2$ | 383.2576*** | 320.8692*** | 77.22856*** | 318.8110*** | 392.4942*** | 604.1809*** |
| J-Statistic | 26.8903 | 28.5957*** | 601.0097*** | 30.2149 | 33.0180 | 336.8049*** |

Notes: Each variable is in its first difference form. ***, **, * denotes significant at 1%, 5%, 10% level respectively. The *t*-statistics in parentheses are the *t*-values adjusted for White's heteroscedasticity consistent standard errors; (1) Wald test statistic refers to the null hypothesis that all coefficients on the determinants of the target debt ratio are jointly equal zero. (2) Second order correlation refers to the null of no second order correlation in the residuals. (3) The *J* test statistic for the null that the over identifying restrictions are valid.