THE JOINT DETERMINANTION OF LEVERAGE AND MATURITY:

EMPIRICAL EVIDENCE FROM MALAYSIA

A Thesis Submitted to the Postgraduate Studies Othman Yeop Abdullah Graduate School of Business

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In Fulfillment of the Requirement

For the Degree of Master of Science in Finance

By

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DECLARATION

I hereby declare that this thesis entitled “The Joint Determination of Leverage and Maturity: Empirical Evidence from Malaysia” is based on my original research except for quotations and citations that have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Utara Malaysia of other institutions.

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ABSTRACT

This study empirically investigates the simultaneity between leverage and debt maturity policies and the factors that influence them by using a simultaneous equations framework in which leverage and debt maturity are endogenous variables. Based on a panel data of 788 non-financial firms listed on Bursa Malaysia from 1999 until 2010, this study estimates a single equation model on leverage and debt maturity using an Estimated Generalized Least Squares (EGLS) approach. The simultaneity between leverage and debt maturity is tested by utilizing a two-stage least squares (2SLS) regression model. The results of this study show that leverage and debt maturity policies have a negative simultaneous relationship which indicates that there are strategic complementarities between leverage and maturity. This study also documents different results among the exogenous variables in both equations, in which *growth opportunities, regulation, firm size, profitability* and *tangibility* lend considerable support to the proposed hypotheses on the leverage equation. Meanwhile, *firm size, regulation, abnormal earnings* and *tangibility* are found to have significant effects on the debt maturity equation.

Keyword: *Simultaneity, Capital Structure, Leverage, Debt Maturity*

TABLE OF CONTENTS

CHAPTER THREE : METHODOLOGY

CHAPTER FOUR : ANALYSIS AND FINDINGS

CHAPTER FIVE : CONCLUSION

LIST OF TABLE

LIST OF FIGURE

LIST OF ABBREVIATIONS

ABNR	: Abnormal Earnings
ASMAT	: Assets Maturity
AR	: Autoregressive
BNM	: Bank Negara Malaysia
CAP	: Capitalization
DM	: Debt Maturity
EGLS	: Estimated Generalized Least-Square
EBIT	: Earnings before Interest and Taxes
EPS	: Earnings per Share
GDP	: Gross Domestic Products
GROW	: Growth Opportunities
LEV	: Leverage
MGS	: Malaysia Government Securities
NOL	: Net Operating Loss Carryforwards
OLS	: Ordinary Least Squares
REIT	: Real Estate Investment Trust
ROA	: Return on Asset (Profitability)
PPE	: Property, Plant and Equipment
REGUL	: Regulated Firm
SC	: Security Commission
SPREAD	: Term Structure
TANG	: Tangibility
T-bills	: Treasury Bills
TAX	: Effective Tax Rate
SIZE	: Firms Size

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

In principle, every company needs funding and the fulfillment of these funds may come from internal sources or external sources. The selection of the financial structure is a matter which concerns the composition of funding that will be used by a company. This will then determine how much debt will be incurred to finance its assets.

Capital structure which forms the basis for permanent funding consists of long-term debt, preferred stock and shareholders' equity. The basic element of a corporate financial policy includes the choice of debt level and also the structure of debt maturity (Barclay, Marx, & Smith, 2003). Barclay and Smith (1995) suggest that when firms choose debt as a source of funding, they should also consider other financial factors such as debt maturity, priority and whether to use public debt or private debt. Barclay et al. (2003) further postulate that when it comes to funding, other factors often occur simultaneously.

Leverage and debt maturity are the twin dimensions that cannot be separated from the corporate capital structure, in other words, when a firm issues new debt, it needs to decide the period of maturity and the size of the debt level concurrently (Elyasiani, Guo, & Tang, 2002). In addition, Barclay and Smith (1995) assert that when firms choose debt as a source of funding, they also need to consider the maturity

of debt because the selection of debt maturity will affect the value of the firm. In essence, these studies contend that the choice of debt policy and debt maturity structure should be considered simultaneously.

Barclay, Marx, and Smith (1997) is the pioneering study in examining the simultaneity between the policies on leverage and debt maturity among U.S. firms based on a simultaneous equations framework. Their findings reveal strategic complementarities between maturity and leverage. Using a different system of simultaneous equations, Barclay et al. (2003) show that although leverage and maturity are strongly correlated in terms of both unconditional and conditional correlations, there is evidence that both leverage and debt maturiy are not complements. They, however, note that their model is possibly misspecified. Other subsequent empirical studies by Elyasiani et al. (2002), Johnson (2003), Sunarsih (2004) and Billett, King, and Mauer (2007) provide evidences of strategic complementarities between leverage and maturity. Based on these models of simultaneous equations framework, this study attempts to examine the simultaneity between the policies on leverage and debt maturity among Malaysian public-listed firms during the period from 1999 to 2010.

This chapter is divided into 5 sections which are as follows: Section one describes the background of the study and the overview of the Malaysian economy and capital market. Section two and Section three present the problem statement and research questions respectively. The significance of the study is discussed in Section four. Section five covers the scope and limitations of the study. Meanwhile, Section

six describes the organization of the study and finally, Section seven concludes this chapter.

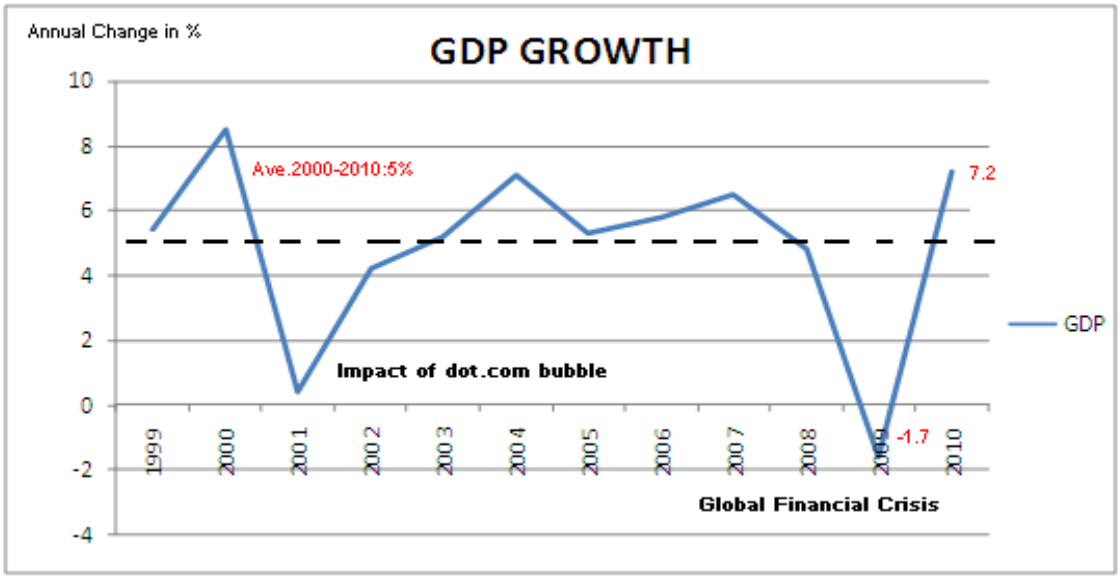
1.1.1 OVERVIEW OF THE MALAYSIAN ECONOMY

This section describes briefly about the Malaysian economy and its development during the study period. Being an emerging market economy, the Malaysian government has implemented a number of medium to long-term development plans, such as the National Development Policy in early 1990s and the latest is the Third Outline Perspective Plan that provides the general thrust of Malaysia's development strategy during the 2001-2010 period. As Malaysia is an open economy, it is very vulnerable to the uncertainties of the world's economic situation. In the past decade, the Malaysian economy has been facing a challenging external environment, in particular the Asian financial crisis in 1997-1998 and the global financial crisis in 2007-2008.

The Malaysian economy went into a sharp recession in 1998 where its Gross National Product (GNP) contracted to 7%. The Asian financial crisis in 1997 had crippled the financial sector, which was further exacerbated due to the overlending activities together with the lack of prudential regulation and supervision. At the end of 1997, asset in the banking sector was valued RM480 billion or 1.8 times to GNP. These figures showed that a substantial amount of funds had been moved and provided to the private sector as loans. However, given the implicit control of Bank Negara Malaysia (BNM), external debts in the private sector were kept relatively small.

The Malaysian economy began its recovery in 1999 after the Asian financial crisis subsided. The Gross Domestic Product (GDP) increased by 5.4% and 8.5% in 1999 and 2000 respectively. The economy has gradually continued to grow since 2000 onwards, with the exception of 2001 where it was negatively impacted by the bursting of the dot com bubble. The growth rate contracted from 8.9% in 2000 to merely 0.4% in 2001. After 2001, Malaysia returned to a steady path of GDP growth averaging 5.3% annually from 2002 until 2007 (see Figure 1.1).

Figure 1.1: *Annual Change of GDP*



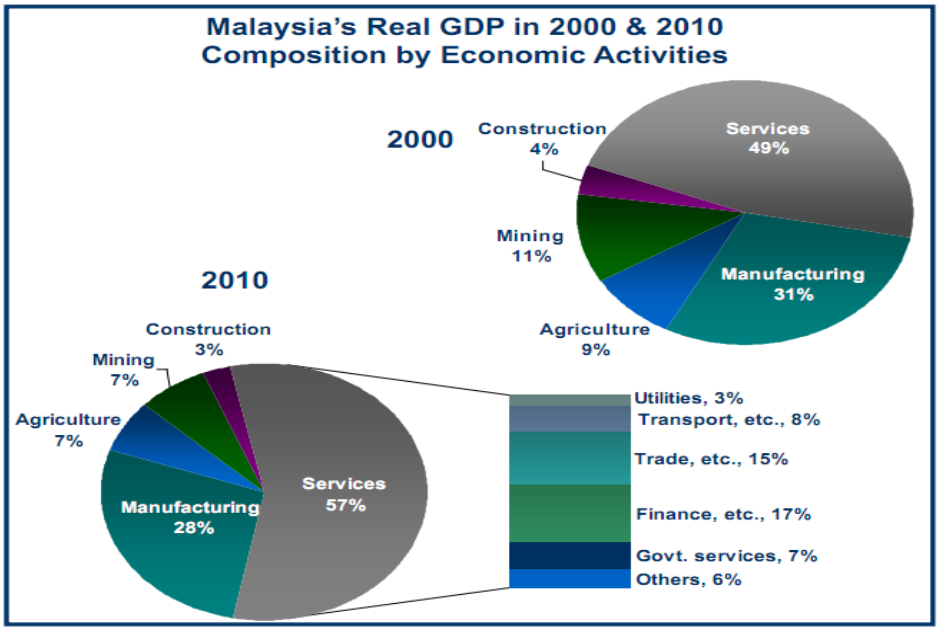
Source: Department of Statistics, Malaysia

The global financial crisis, which started in mid-2007 when the US financial system collapsed due to the deterioration of sub-prime assets, threw Malaysia into recession again in 2009. The decline in exports, industrial production, manufacturing, and subsequently private investment activities resulted in the GDP growth shrinking to -1.7% in 2009. In 2010, the GDP growth rebounded to 7.2% as the global financial crisis gradually abated.

The Malaysian economic growth could also be viewed from the movement of its export and import. Malaysia is a highly open economy with large shares of exports and imports in its GDP. As for the last ten years, the sum of exports and imports of goods and services amounted approximately 176% of GDP in 2010. The main economic sectors are services, manufacturing, agriculture, mining and construction (see Figure 1.2).

Whilst other sectors recorded a decline, it is notable that the contribution of the services sector grew from 49% in 2000 to 57% in 2010. This is in line with the government efforts to move the country towards a services-based nation from a formerly manufacturing-based. The contribution of manufacturing activities to the GDP decreased from 31% in 2000 to 28% in 2010. This decline is also due to the global financial crisis which has not only dampened industrial production in export-oriented sectors but has also gradually reduced demand indirectly from the domestic manufacturing as well as the other sectors.

Figure 1.2: *Real GDP by Sectors in 2000 and 2010*



Source: Department of Statistics, Malaysia.

1.1.2 THE MALAYSIAN CAPITAL MARKET

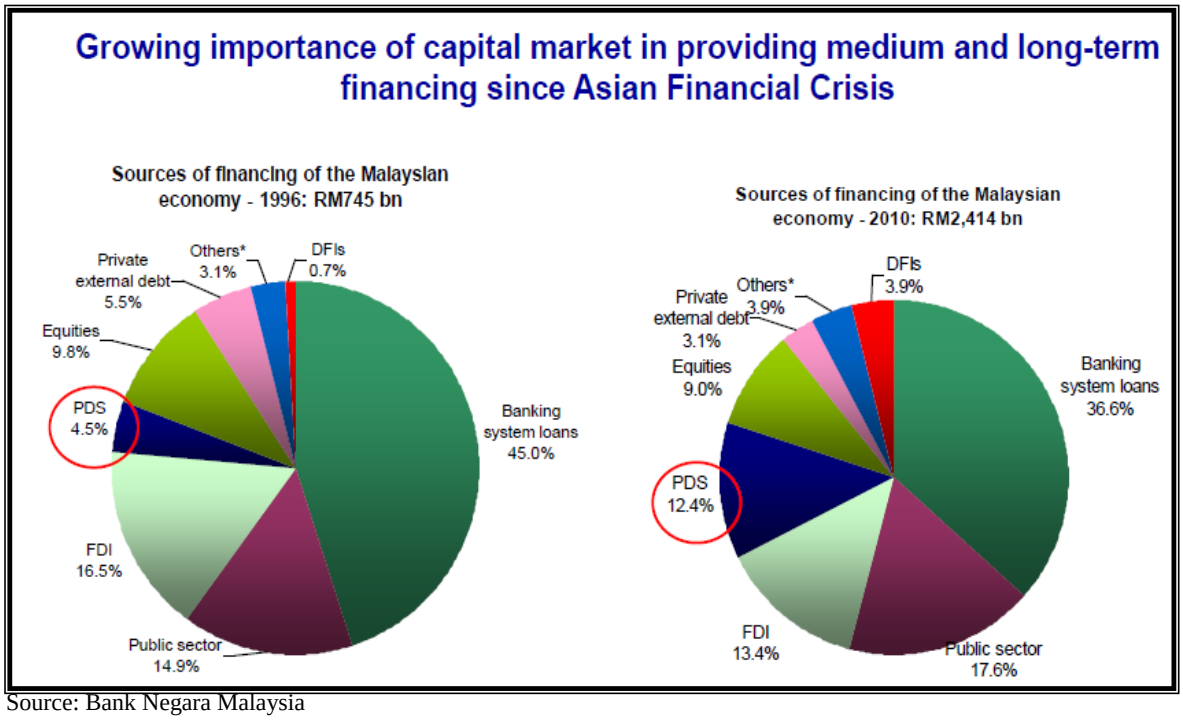
The Malaysian capital market has undergone tremendous change and development and assumed a significant role in the overall financial sector over the last decade. The financial assets issued and traded in the Malaysian capital market generally consist of corporate stocks, government securities, private debt securities and shares listed on Bursa Malaysia. Government securities are mainly comprised of the Malaysian Government Securities (MGS). Private debt securities (PDS), either in the form of conventional bonds or Sukuk (Islamic bonds), are the growing main source of funding for the private sector. In the equity market, funds are typically raised through Initial Public Offerings (IPOs) and right issues.

Since 2000, the government has introduced a number of new measures to further develop the capital market. These measures include strengthening the stockbrokerage industry through consolidation; promoting the bond and Sukuk market with new guidelines and regulations; relaxing rules on use of proceeds from issuance of PDS; enhancing the market mechanism and competitiveness; improving corporate governance and the protection of minority shareholders; and promoting the fund management industry.

Since the Asian financial crisis, the capital market has played an important role in providing medium and long-term financing. In the past, banks traditionally played the major in mobilizing financial resources for the Malaysian economy. For example, the sources of financing from banking system loans in 1996 stood at 45.0%. However, the financial system has been gradually diversified to avoid over burdening the banking system as the economy grows and changes structure. In 2010, the composition of banking system loans has declined to 36.6% due to the more diversified sources of financing for the economy.

The sources of financing from PDS issuances have significantly increased from 4.5% in 1996 to 12.4% in 2010. The increase in the number of private and public securities issued after the financial crisis was largely driven by the low interest rate environment, the restructuring of corporate debts and the higher financing demand for expansion. In addition, the contribution from Development Financial Institutions (DFIs) has also recorded an increase from 0.7% in 1996 to 3.9% in 2010 (see Figure 1.3).

Figure 1.3: *Sources of Financing for the Malaysian Economy*



Source: Bank Negara Malaysia

1.2 PROBLEM STATEMENT

Capital structure refers to the combination or mixture of debt and equity financing. The theory of capital structure explains the effects of changes in capital structure to firm value. A good capital structure is one that can maximize the value of a company or stock price. Nevertheless, the managers often make decisions that lead to conflict, especially with the shareholders.

Jensen and Meckling (1976) and Myers (1977) argue that conflict often arises because of differences between the interests of management with the interests of owners (shareholders). This conflict is theoretically referred to as an agency conflict. Basically, a company is established to achieve the overriding goal of increasing

corporate value through increased prosperity of owners or shareholders. However, managers who manage companies may have different goals, such as to improve individual performance or achievement and also to receive the right compensation.

Another factor that contributes to agency conflict is the signaling effect. According to Barclay, Smith, and Watts (1995), the signaling effect occurs because of the existence of asymmetric information between the managers and shareholders. Managers potentially have more information about the future of company than investors do. Consequently, investors tend to have a different perception than that of the manager about future corporate profits. Thus, it can be inferred that there is a practical gap between managers and shareholders in achieving their respective goals.

Numerous studies have been performed on capital structure issues pertaining to leverage and debt maturity. Barclay and Smith (1995), Guedes and Opler (1996) and Barclay et al. (1997) find there is a negative relationship between maturity and growth opportunities. However, these findings are in contrast to Chen (2004) and Wald (1999) who suggest a positive relationship between maturity and growth opportunities. Under the trade-off theory, firms holding future growth opportunities in the form of intangible assets are inclined to borrow less than firms that have more tangible assets because of the growth opportunities cannot be collateralised. Hence, the agency cost theory seems to contradict with the trade-off theory whereby the former argues that more growth opportunities will result in greater agency conflict between managers and bondholders (Jensen, 1986).

Leverage and debt maturity also depend on the size of the company. Nevertheless, the relationship between size and leverage is still theoretically unclear. According to the trade-off theory, larger firms should have relatively easier access to the capital market, indicating that large companies can easily meet their funding needs from the capital market. Rajan and Zingales (1995) find that firm size has a positive influence on leverage. This means that large companies which have a positive relationship with leverage may also be able to reduce transaction cost associated with long-term debt issuance (Chen, 2004). However, according to the pecking order theory, size has a negative effect on leverage. This implies that large firms have lower information asymmetry between insiders within a firm and the capital market. Therefore, large firms should be more capable of issuing informationally sensitive securities like equity (Chen, 2004).

Stohs and Mauer (1996) argue the findings by Barclay and Smith (1995) on the relationship between debt maturity and growth opportunities are misspecified because they do not control the differences in leverage in their ordinary least squares (OLS) debt maturity regression. When Stohs and Mauer (1996) add leverage to the right hand side of their debt maturity regression, they discover that coefficient on the growth opportunities variable has a statistically significant positive relationship.[1]

[1]As Barclay, Marx, and Smith (1997) point out, the positive coefficient in Stohs and Mauer (1996) is, nevertheless, potentially biased. This is because they include leverage in the OLS debt maturity regression. When Stohs and Mauer exclude leverage from the OLS equation, they find a negative relationship between maturity and growth opportunity.

Therefore, it is improper to take one as predeterminant when analyzing how firms choose the other. The coefficients estimated in the OLS regression of debt maturity model on the leverage and others variables will suffer from simultaneous equation bias (Barclay et al., 2003).

Besides the theoretical gap in the determinant factors for leverage and debt maturity, there also exists some practical gap in determining the simultaneity relationship between both leverage and maturity equations. Barclay et al. (2003) find that the coefficient on debt maturity in the leverage regression and the coefficient on leverage in the debt maturity regression have a different sign which indicate that leverage and debt maturity are not complementary to each other.[2] Elyasiani et al. (2002) and Sunarsih (2004) suggest a positive relationship between leverage and maturity, implying leverage and maturity are complementary to each other and there is simultaneity between leverage and debt maturity policies. Johnson (2003), however, finds a negative relationship between leverage and short-term debt.[3]

Following the theoretical and practical gaps described above, the authors opines that further research is warranted to test the simultaneous equations framework on leverage and maturity policies among firms in developing countries like Malaysia. Therefore, this study aims to examine the factors that influence leverage and debt maturity and subsequently to investigate the simultaneous relationship between leverage and debt maturity using a sample of Malaysian listed companies.

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[2] Barclay et al. (2003) state that there is a possibility of misspecification in the model.

[3] The negative sign in Johnson (2003) is possibly due to the multicollinearity problems where the predicted leverage in the maturity equation and the predicted maturity in the leverage equation are highly correlated with market-to-book (growth opportunities).

1.3 RESEARCH OBJECTIVES

The objective of this study is to investigate the joint determinants of leverage and debt maturity policies among Malaysian public-listed companies. The specific research objectives are as follows:

1. To investigate whether there is simultaneity between leverage and debt maturity policies among Malaysian listed companies.
2. To examine whether there is a significant relationship between the leverage policy and its determinant factors.
3. To examine whether there is a significant relationship between the debt maturity policy and its determinant factors.

1.4 RESEARCH QUESTIONS

Based on the research objectives above, this study attempts to answer the following questions:

1. Is there any simultaneity between the leverage and debt maturity policies?
2. Is there any significant relationship between the leverage policy and its determinant factors?
3. Is there any significant relationship between the debt maturity policy and its determinants factors?

1.5 SIGNIFICANCE OF THE STUDY

This study aims to analyze the impact of financial decisions in terms of determining the debt structures by focusing on the simultaneity between leverage and debt maturity policies. It employs a simultaneous equations framework of leverage and debt maturity using two-stage least squares regression (2SLS) model for a sample of Malaysian public-listed companies.

This study intends to provide a useful guidance for corporate managers and fund managers in terms of making financial decision regarding the capital structure of a firm. The findings are envisaged to advance the managers' understanding of corporate capital structure decisions and enable them to plan and implement a firm's financial policy effectively and efficiently. As for the policy makers, especially the capital market regulators, the findings could help them to formulate conducive policies and regulations that strengthen the capital market and stimulate the economic growth. Investors could utilize the information in analyzing and selecting potential investee companies and making a well-informed investment decisions.

In addition, as for researchers and academicians, this study could be used to increase knowledge and analytical skills about simultaneity between leverage and debt maturity policies as well as it could be utilized as references for future research. In general, the findings from this study could help to provide further information and empirical evidence into the existing literatures on the simultaneous relationship between leverage and debt maturity.

1.6 SCOPE AND LIMITATION OF THE STUDY

This study focuses on the analysis of simultaneous relationship between leverage and debt maturity policies among firms listed on Bursa Malaysia. It uses secondary data from financial statements issued by all listed companies, except financial institutions and firms involved in financial and insurance-related businesses.

The framework and design of this study is similar to past studies conducted in developed countries. The variables used in this study are replicated from prior studies and the data are obtained from *Datastream* and Bursa Malaysia. The period of observation is twelve years starting from 1999 until 2010.

1.7 ORGANIZATION OF THE STUDY

This study is organized as follows: Chapter one provides an introduction of the study. It contains the background of the study, problem statement, research objectives, research questions, significance of the study, and scope and limitation of the study. Apart from this introductory chapter, there are four other chapters. The reviews of theoretical literatures and past empirical studies are discussed in Chapter two. Thereafter, the research framework and hypothesis, which are constructed from the formulated research, are presented in Chapter three. Chapter four discusses the empirical findings and provides the potential explanations of the results. Finally, Chapter five concludes the overall research with some suggestions for further research in this field.

1.8 CONCLUSION

This chapter presents the background of the study, overview of the Malaysian economy and capital market, research objectives, research questions, significance of the study, the scope and limitation of the study and the organization of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter two presents the theoretical and empirical literatures that are related to this study. This chapter is divided into four sections. Section 2.2 discusses the theoretical literatures in capital structure and debt maturity, namely the trade-off theory, agency cost theory, signaling theory, pecking order theory, tax theory and matching theory. Section 2.3 discusses the relevant empirical literatures which are arranged in a chronological order. Lastly, Section 2.4 concludes this chapter.

2.2 THEORETICAL LITERATURE

There has been a great deal of research into both capital structure theory and debt maturity theory, but relatively little into how the two theories may relate to each other. In order to lay a theoretical framework for this study, a review of capital structure theory and debt maturity theory literature should be done independently. These studies also explore how and why existing researches suggest that there might be a link between the two proxies.

2.2.1 THEORETICAL LITERATURE UNDER CAPITAL STRUCTURE

A. TRADE-OFF THEORY

Trade-off theory states that a company which is being taxed should increase the level of its debt until it reaches the marginal value of the tax limit from the cost of financial distress. The trade-off theory of capital structure is basically to balance the tax advantages of borrowing to cover the cost of financial distress.

Myers (1984) and Bringham and Gapenski (1996) state that trade-off theory applies when companies have an optimal capital structure which is determined by comparing the costs and benefits of the use of debt and equity. Based on the balance theory or trade-off theory, an optimal capital structure is formed by balancing the benefits of tax savings over the use of debt against bankruptcy costs.

One advantage of using debt is tax reduction while the loss from the use of debt is the cost of potential financial distress. As a result, this will lead to the theory of the trade-off between tax advantages and the magnitude of the risk of financial difficulties.

According to Matthew, Tao, and Mauer (2007), the decision to increase leverage involves a trade-off between the costs and advantages of using debt financing. They said that the most important issue is that the cost of debt financing can raise the potential issues between shareholders and bondholders over the investment and financing policies of the firm.

In this study, the variables that use the trade-off theory consist of size, growth opportunities and net operating loss carryforwards (NOL). According to the trade-off model, large firms must be having a higher debt capacity and are also able to be more highly geared. Usually, large firms are more diversified so they can be less exposed to the bankruptcy risk (Chen, 2004).

In addition, Johnson (2003) argues that under the trade-off model, firms with higher growth opportunities will lead to an underinvestment problem. Thus, the firms would trade-off the cost of underinvestment problems against the cost of increased liquidity risk when the firms choose shorter-term debt maturity with lower leverage.

Then, the negative relationship between NOL and leverage under the trade-off theory is due to the fact that firms with higher net operating loss will use lower leverage, so the firms can manage their debt and pay it on time. Elyasiani et al. (2002) suggest that if firms with NOL have low tax benefits of debt, the negative relationship can be expected between NOL and leverage.

B. AGENCY COST THEORY

Corporations comprise distinct interests which include shareholders (the owner), the directors, and the corporation officers (top management). Corporate manager acts as the agent of the shareholders. The manager has the power to achieve the ultimate goal of the company which is to increase shareholders' wealth. In order to make the firms grow and perform at the optimal size, shareholders usually give incentives to the managers. These include high salary increment, bonus and stock option.

However, due to the separation between principal and agent, sometimes the managers make decisions which would be in his personal interest rather than the shareholders' interest (managerial discretion). Therefore, there is a possibility of a conflict of interest between the shareholder and managers. Such a conflict is called as an agency problem.

Jensen (1986) asserts that debt is an effective mechanism for reducing agency cost. By using debt rather issuing new shares, managers give the right for bondholders to bring the problem and take the firm into bankruptcy court if managers do not maintain their promise to increase value for them such as paying principal payments and interest.

The debt financing generates a shield against agency costs of free cash flow, which is similar to a tax shield. However, increased leverage also has costs. If leverage increases, the agency cost of debt will also increase, including bankruptcy costs. In such situation, after the default of the debt, those shields will be lost. Therefore, there is a trade-off between the benefits of the agency cost shield and the implicit bankruptcy costs. The maximization of the firm value could be achieved by optimizing the debt-equity ratio.

To reduce debt agency and increase optimal leverage, the managers of regulated firms always have less discretion over their investment decision (Smith, 1986). This means that regulated firms always increase optimal leverage to reduce the agency risk. Barclay and Smith (1995) argue that regulated firms can borrow longer

term as agency problem are less severe. It is because regulated firms with less discretion in investment decision can minimize the agency cost problem. Furthermore, the agency theory's negative relationship between profitability and leverage is supported by Barclay et al. (2003) who argue that the agency cost model of capital structure predicts that increase in profitability will give effect to the lower leverage.

C. THE SIGNALING THEORY

This theory is based on the premise that managers and shareholders do not have the same access to information about the company. There is certain information that is only known by managers, while shareholders do not know about it. Thus, there exists asymmetric information between managers and shareholders. Consequently, when the company's capital structure change, it can bring information to shareholders that will result in the change in the value of the company. In other words, there is a signal for investors to make a decision, for example, concerning the investment being made by the company.

According to Ross (1977), the incentive signaling approach states that when companies issue new debt, it can be a signal to shareholders that future prospect of companies have increased. Hence, it can be concluded that the addition of debt would result in limited cash flow and increase financial burden for the company. As a consequence, managers will only issue new debt if they believe the company can meet its obligations.

According to the signaling models, growth opportunity and leverage have a positive relationship. Signaling model generally predicts that companies with bright growth prospects will use almost all the leverage to finance their investments (Chen, 2004).

In addition, the signaling theory postulates that tangibility has a positive relationship with the leverage. Harris and Raviv (1990) suggest that leverage should increase with liquidation value and this is supported by Williamson (1988). Both of them contend that tangibility is positively related to leverage as for firms with higher asset tangibility, these assets can be used as collateral and thus, reducing the risks faced by lender such as suffering from agency cost of debt. Therefore, high leverage is expected to be associated with high fraction of tangible assets.

In this study, the abnormal earnings' positive relationship with leverage is based on signaling theory. Firms with higher returns always optimize their leverage because higher return always gives positive signal to the market (Flannery, 1986) and (Diamond, 1993).

D. PECKING ORDER THEORY

Pecking order theory is used to determine the source of company funds. According to Brealey and Myers (1996), pecking order theory posits that companies prefer internal financing and the company will try to adjust the ratio of dividends to investment opportunities and try not to make changes involving too large dividend payments.

Myers (1984) states that based on the pecking order theory, firms prefer to finance investment opportunities with funds collected internally than new sources of external capital funding. When external funding is needed, the company will first choose to issue debt securities and then issuing new equity as the type of securities. But, when greater external financing is needed to fund the projects that have a positive present value, the sequence of tiered funding will follow. This means that the preference is on a more risky loan, followed by a convertible equity, and then equity and preferred stock (equity) are used as a last resource.

In this study, profitability is assumed to have a negative relationship with leverage. This is supported by Megginson (1997) who suggests that the tendency of profitability to be inversely related to leverage due to profitable firms tend to have fewer loans. This is also in line with Myers (1984) who argues that more profitable firms with higher return on assets will have greater retained earnings and would like to use their retained earnings first to finance new projects or investments.

The pecking order theory also supports a positive relationship between growth opportunities and leverage. Bringham and Houston (2001) state that if other things remain the same (*ceteris paribus*), a growing firm will rely more on external financing. Since the cost of to issue common stock is more expensive that issuing bonds, the firms that resort to the use of external financing are more reliant on debt than equity financing.

Table 2.1: *Summaries of Theories under Capital Structure*

Theoretical Literature under Capital Structure		
THEORY	**PROXY**	**EXPLANATION**
Trade-off Theory	• Size	• Large firms must be having higher debt capacity and also capable to be more highly geared which is in line with trade-off theory. • Usually large firm are more diversified, so it can be less exposed to the bankruptcy risk (Chen, 2004).
	• Growth Opportunities	• Under the trade-off model, firms with higher growth opportunities will lead to an underinvestment problem and thus, the firms would trade-off the cost of underinvestment problems against the cost of increased liquidity risk when the firms choose shorter-term debt maturity with lower leverage (Johnson, 2003).
	• NOL carryforwards	• Firm with higher net operating loss (NOL) will use lower leverage so that the firms can manage their debt and pay it on time. • Elyasiani et al. (2002) state that if firms with NOL have low tax benefits of debt, the negative relationship is expected between NOLs and leverage.
Agency Cost Theory	• Regulation	• To reduce debt agency cost and increase optimal leverage, the managers of regulated firms always have less discretion over their investment decision (Smith, 1986). This means that regulated firms always increase optimal leverage to reduce the agency risk.
	• Profitability (ROA)	• Agency cost model of capital structure predicts that increase in profitability will result in lower leverage (Barclay et al., 2003).
Signaling Theory	• Growth Opportunities	• According to the signaling models, growth opportunity and leverage have a positive relationship. Signaling model generally predicts that companies with bright growth prospects will use almost all the leverage to finance their investments (Chen, 2004).
	• Tangibility	• Tangibility has a positive relationship with leverage because tangible assets are easy to be collateralized for leverage (to reduce the risk to the lender).
	• Abnormal Earnings	• The firms with higher return always optimize their leverage because higher return always gives positive signal to the market.
Pecking Order Theory	• Profitability	• Megginson (1997) suggests that the tendency of profitability to be inversely related to leverage due to profitable firms tend to have fewer loans. • This is also in line with Myers (1984) who argues that more profitable firms with higher return on assets will have greater retained earnings and would like to use their retained earnings first to finance new projects or investments.
	• Growth Opportunities	• Bringham and Houston (2001) state that if other things remain the same (*ceteris paribus*), a growing firm will rely more on external financing. Since the cost of to issue common stock is more expensive that issuing bonds, the firms that resort to the use of external financing are more reliant on debt than equity financing.

2.2.2 THEORETICAL LITERATURE UNDER DEBT MATURITY

A. AGENCY COST THEORY

It is important to understand the significance of agency cost as a theory to determine the choice of firms' financial structure. Leland and Thoft (1996) argue that the optimal capital structure of a firm relies on maturity of debt and the agency problem can be mitigated when the firm is financed by short-term debt.

Agency cost arises when firms with risky debt have an incentive to change from low risk assets into high risk assets. Such a situation is referred to as problem assets substitution (Jensen & Meckling, 1976). To reduce the agency related costs, firms will issue short-term debt maturity because firms with short-term debt maturity do not exploit tax benefits like firms with long-term debt maturity. It is because firms with short-term debt will have less incentive to raise their risk after the bond has been issued.

The exogenous variables under the agency cost theory consist of size, growth opportunities and regulation. Usually, larger firms face lower asymmetric information and agency problems with higher tangible assets to the future investment opportunities and thus, the large firms have easier access to long-term debt markets (Antoniou, Guney, & Paudyal, 2006). Agency problem faced by small firms will make them restrict the length of debt maturity.

In general, firms with higher growth opportunities prefer to use smaller proportion of long-term debt whereby they control their underinvestment activities and agency cost through short-term debt (Ozkan, 2002). Titman (1992) states that firm with higher growth will more likely face bankruptcy but optimistic future outlook; thus the firms will take advantage from borrowing short-term and swapping it for a fixed rate contract. This echoes Myers (1977) who asserts that bankruptcy risks related to leverage can be mitigated by using short-term debt.

In addition, underinvestment problem would reject negative net present value (NPV), which refers to the project that are not able to offer a positive return and the probability of default in risky debt as well as refinancing risk can be reduced (Myers, 1977). This is also supported by Bodie and Taggart (1978) who state that shortening the maturity of debt can solve problems associated with the investment opportunity in the future. Similarly, Barnea, Hougen, and Senbet (1980) suggest that the conflict between shareholders with the bondholders (underinvestment problem) in companies with high investment opportunities can be controlled by shortening debt maturity.

On the other hand, firms with higher growth opportunities with higher asset in place (lower investment opportunity) will face overinvestment problem. To control the overinvestment problem, firms should use a higher leverage with long-term debt maturity. This argument is supported by Stulz (1990) and Hart and Moore (1995) who suggest that firms facing growth opportunities should prefer longer maturity of debt since it is more effective in controlling overinvestment problem.

Furthermore, according to agency cost theory, regulated firm is positively related to debt maturity structure. Optimal debt maturity should be longer to regulated firms because regulatory controls restrict managers' discretion over corporate investment decisions and thereby able to control the aspects of underinvestment problem (Smith, 1986).

B. SIGNALING THEORY

Ozkan (2002) states that signaling model is used by rational investors to get private information held by insiders through analysis of firm's debt maturity structure. Debt maturity structure can be a signaling device to potential investors that do not have any inside information (Flannery, 1986). For example, when insiders are better informed than outside investors about quality of firm, the outside investor would use debt maturity structure to measure the firm performance. In general, less valuable firms choose long-term debt maturity whereas more valuable firms prefer to finance their projects with short-term debt maturity because, with positive transaction costs, low quality firms are not able to roll over short-term debt (Ozkan, 2002).

The signaling theory suggests a positive relationship between leverage and debt maturity, which is in line with Leland and Toft (1996) who argue that larger firms always choose higher leverage and long-term debt maturity to delay their exposure to bankruptcy risk. Johnson (2003) further argues that there exists a positive relationship between leverage and longer term debt maturity. His simultaneous equation results are consistent with the single equation done by Barclay and Smith (1995) who find that firms with longer maturity have higher leverage.

In addition, the relationship between net operating loss carryforwards and debt maturity is expected to be negative. This argument is supported by Johnson (2003) who finds that firms that have greater in net operating loss carryforwards tend to use short-term debt maturity.

The selection of maturity structure by corporate managers will provide useful information to investors. This in line with Flannery (1986) who states that the selection of the maturity structure of the debt means insiders have better information than outside investors. Higher return will give positive signal to the market. Thus, firms with positive information about future prospect prefer to use short-term debt that can be refinanced after the information is revealed (Flannery, 1986).

C. TAX THEORY

Based on the assumptions of a positive tax advantage of leverage and a positively sloped yield curve, it is argued that firms prefer to finance its project using long-term debt which would raise the firm value. This is because in early years the present value of interest tax shield from long-term debt is greater than that of from rolling short-term debt maturity (Ozkan, 2002). Besides that, issuing long-term debt can mitigate the firm's expected tax liability which can increase the firm's current market value.

Brick and Ravid (1985) argue that when the term structure has a positive slope, the firms will use more long-term debt. They analyze the tax implications of debt maturity structure and state that the expected value of tax shields relies on

maturity structure whenever the term structure of interest rates is not flat. Higher priced long-term debt allows the firm to avoid more taxes (Stephan, Talavera, & Tsapin, 2011). Furthermore, Kim, Mauer, and Stohs (1995) affirm that the increase of the slope of term structure and the interest rate volatility can make firms to choose longer term debt maturity in their capital structure. Hence, term structure is expected to have a positive relationship with debt maturity.

D. MATCHING THEORY

Bringham and Houston (2006) describe that maturity matching approach or self-liquidating approach is a method to match the maturity of assets against the debt of liabilities. This strategy is used to minimize the inability to repay debt obligations that have matured. Several studies show that most companies tend to finance their short-term assets with short-term maturity of funds and long-term assets with long-term sources.

Myers (1977) postulates that agency cost of debt can be reduced through the reduction of debt that is parallel with the reduction in value of assets. This is supported by Ozkan (2002) who argues that firms that have more long-term assets will prefer to use long-term debt to finance it assets. Similarly, Stohs and Mauer (1996) state that companies should adjust the maturity of the assets. If the debt has a maturity that is longer than the maturity of its assets, then there is a tendency for companies not having enough cash to pay debts when they mature.

Table 2.2: *Summaries of Theories under Debt Maturity*

Theoretical Literature under Debt Maturity		
THEORY	**PROXY**	**EXPLANATION**
Agency Cost Theory	• Size	• Usually, larger firms face lower asymmetric information and agency problems with higher tangible assets to the future investment opportunities and thus, the large firms have easier access to long-term debt markets (Antoniou, Guney, & Paudyal, 2006). • Agency problem faced by small firms will make them restrict the length of debt maturity.
	• Growth Opportunities	• Titman (1992) states that firm with higher growth will more likely face bankruptcy but optimistic future outlook; thus the firms will take advantage from borrowing short-term and swapping it for a fixed rate contract. • Myers (1977) who asserts that bankruptcy risks related to leverage can be mitigated by using short-term debt.
	• Regulation	• Optimal debt maturity should be longer to regulated firms because regulatory controls restrict managers' discretion over corporate investment decisions and thereby able to control the aspects of underinvestment problem (Smith, 1986).
Signaling Theory	• Leverage	• There is a positive relationship between leverage and debt maturity, which is in line with Leland and Toft (1996) who argue that larger firms always choose higher leverage and long-term debt maturity to delay their exposure to bankruptcy risk. • Barclay and Smith (1995) find firms with longer maturity have higher leverage.
	• NOL carryforwards	• The relationship between net operating loss carryforwards and debt maturity is expected to be negative. • This argument is supported by Johnson (2003) who finds that firms that have greater in net operating loss carryforwards tend to use short-term debt maturity.
	• Abnormal Earnings	• Higher return will give positive signal to the market. Thus, firms with positive information about future prospect prefer to use short-term debt that can be refinanced after the information is revealed (Flannery, 1986).
Tax Theory	• Term Structure	• Kim, Mauer, and Stohs (1995) affirm that the increase of the slope of term structure and the interest rate volatility can make firms to choose longer term debt maturity in their capital structure. Hence, term structure is expected to have a positive relationship with debt maturity.
Matching Theory	• Asset Maturity	• Several studies show that most companies tend to finance their short-term assets with short-term maturity of funds and long-term assets with long-term sources.

2.3 EMPIRICAL LITERATURE

2.3.1 CAPITAL STRUCTURE

A number of factors influence firm's capital structure choice such as firm size, growth opportunities, profitability, tangibility, effective tax rate and abnormal earnings. In their distinguished works, Harris and Raviv (1991) summarize that "leverage will increase with fixed assets, non-debt tax shields, investment opportunities and firm size, whereas other variables like volatility of earnings, advertising expenditure, the probability of bankruptcy, profitability and uniqueness of the product will decrease the leverage." However, the relationship between the proxies or factors and capital structure theory is inconsistent. The empirical results vary and sometimes contradict with the theory. In addition, comparisons of capital structure across countries reveal that institutional differences may affect the cross-sectional relation between leverage and factors.

Rajan and Zingales (1995) investigate the determinants of capital structure in the major industrialized countries. They find that at an aggregate level, firm leverage is fairly similar across the G-7 countries and those factors identified by previous studies as important in determining the cross section of capital structure in the U.S. affect firm leverage in other countries as well.

Titman and Wessels (1988) analyze the explanatory power of some of the recent theories on optimal capital structure. They use eight attributes that different theories of capital structure suggest may affect the firm's debt-equity choice. These attributes are denoted as asset structure, non-debt tax shields, growth, uniqueness,

industry classification, size, earnings volatility and profitability. The results of their study indicate that transaction cost may be an important determinant of capital structure choice. They also find that debt levels are negatively related to the "uniqueness" of a firm's line of business.

Chen (2004) explores the determinants of capital structure of Chinese listed-companies using firm level panel data. He found that profitability, size, growth opportunities and tax shield effects are significant to leverage. De Jong, Kabir, and Nguyen (2008) analyze the importance of firm-specific and country-specific factors in the leverage choice with the sample taken from 42 countries around the world. They find that firm-specific determinants of leverage differ across countries whereas prior studies implicitly assume equal impact of these determinants.

Ozkan (2001) also examined the determinants of target capital structure of companies by focusing on the dynamic of capital structure decisions among firms in the United Kingdom. He uses debt as independent variables while the control variables are size, non-debt tax shield, liquidity, profitability and growth opportunities. The results provide evidence that profitability, liquidity and growth opportunities exert a negative effect in the capital structure choice of firms, whereas there is an inverse relationships between non-debt tax shields and borrowing ratio of firms.

Delcoure (2007) investigates the determinants of capital structure in emerging Central and Eastern European countries (CEE). The findings show that firms in CEE

countries tend to rely more heavily on short-term debt maturity than long-term debt in using their capital structure. This is in contrast with firms in developed countries that choose more long-term debt than short-term debt maturity. Delcoure (2007) further state that the companies incurring huge debt will face serious problem to service it; sometimes companies are unable to meet these obligations, and even declared bankrupt.

Gurcharan (2010) examines a sample of 155 main listed-companies from four selected ASEAN stock exchange index linked-components for the 2003-2007 period and discovers an inverse relationship between profitability and growth opportunities with the leverage. The non-debt tax shield has negative correlation with leverage. The study also finds different results on firm size effects. For example, in Indonesia and Philippines, it shows a positive relationship between size and leverage whereas for Malaysia and Thailand, a negative relationship exists.

The effectiveness of the use of debt can also be considered by using the development of theories in capital structure. Many researchers use the developed theories of capital structure to obtain the efficiency to the use of capital. One of the studies is done in Malaysia by Ahmed and Hisham (2009). The study revisits the test of pecking order hypothesis and static trade-off theory using a sample of Malaysian listed firms. The evidence show that the pecking order model, which suggests that the internal fund deficiency is the most important determinant, could explain the issuance of new debt in Malaysia capital market but not for static trade-off model.

A study was also done in Gulf Cooperation Council (GCC) countries by Sbeiti (2010) who examines the determinants of capital structure and the impact of stock markets' development on the financing decision among companies in three GCC stock markets. The findings show that leverage or debt has a negative relationship with the control variables such as liquidity, tangibility and profitability while size of the firm is positively and significantly related to the leverage. Growth opportunities are positively related to the book leverage but have a negative relationship with the market leverage in all selected GCC countries.

2.3.2 DEBT MATURITY

There are two important methods to examine debt maturity. The first method is called an incremental approach which is based on a study by Guedes and Opler (1996) whereby debt maturity refers to the term to maturity of debt issues. Rozali and Omar (2011) use the incremental approach to investigate the determinants of the maturity of Malaysian conventional bonds and Sukuk issues over the 1999-2007 period. The second method is called a balance-sheet approach which is based on a study by Barclay and Smith (1995) whereby debt maturity is measured by proportions of short-term or long-term debt over total debts. This section will cover prior studies which employ the balance-sheet approach.

Stohs and Mauer (1996) examine the empirical determinants of debt maturity structure by testing the theoretically grounded debt maturity structure hypotheses with a panel data that contain 328 U.S. industrial firms from 1980 to 1989. They find that proxies for signaling, tax and maturity matching hypotheses are generally significant

determinants of debt maturity structure. They also reveal that larger firms are less risky with longer term asset maturities incurring longer term debt.

Johnson (1997) examines the relationship between corporate debt ownership structure and several firm characteristics. The study focuses on the proportion of long-term bank debt, long-term private non-bank debt, and long-term public debt in firm's capital structures. The results suggest that firms use more public debt if they face lower information and monitoring costs, have a lower likelihood and cost of inefficient liquidation, and have fewer incentives to take action harmful to lenders.

Ozkan (2002) investigates the empirical determinants of corporate debt maturity structure by testing several leading theoretical models of debt maturity structure using a cross sectional data set of 321 non-financial UK firms. The evidence lends considerable support to the prediction that the impact of firm size on debt maturity is positive and also support that firms match maturity structure of their debt to that of their assets. The study also finds agency cost and earnings volatility have a negative relationship with debt maturity.

A recent study by Stephan et al. (2011) examines the underlying determinants of liability maturity choice in an emerging market using a unique panel of 45,000 Ukrainian firms for the period 2000-2006. They use liquidity, agency cost, tax and signaling theories to test the liability term structure of firms operating in a transition economy. They state that they are several ways for firms to prove their capacity to repay debts which are high credit rating, high turnover and high growth opportunities.

2.3.3 SIMULTANEITY BETWEEN LEVERAGE AND DEBT MATURITY

Barclay et al. (1997) is the pioneering study which models the choices of leverage and debt maturity simultaneously and estimate the corresponding simultaneous equations. They assert that using the OLS regressions could be problematic because firms likely choose a level of debt and the maturity of that debt simultaneously. Their findings show that that leverage and debt maturity are endogenously chosen complements. In other words, leverage and maturity are strategic complementarities. They also, however, attribute the problem in their analysis to multicollinearity problems because the predicted leverage in the maturity equation is highly correlated with market-to-book, which is also in the maturity equation

Barclay et al. (2003) examines theories of leverage and debt maturity by focusing more on the impact of firms' investment opportunity sets and regulatory environments. They investigate the selections of leverage and debt maturity and test them using two decades of data from over 5000 U.S. industrial firms. The test used involves both simultaneous equation and reduced form regression methods. They state that changing one of the exogenous variables can have both direct and indirect on the endogenous variables. Debt maturity and leverage were endogenous variables while other control variables like size, profitability, asset maturity, asset tangibility, marginal tax, net operating loss carryforwards (NOL), and a dummy variable for firms with commercial paper programs were exogenous variables. The findings show that firm size and marginal tax rate are positive but only the tax rate coefficient is statistically significant. The coefficients on profitability and growth opportunity are negatively significant and the coefficient on tangibility, regulation dummy and NOL

are positively significant. The negative coefficients on market-to-book ratio in both the leverage and maturity regressions will affect to reduce the firm's leverage and also reduce its fraction of long-term debt. However, the coefficient on debt maturity and leverage in both equations are not complementary to each other. In the 2SLS regression, they find leverage and debt maturity have different sign, which they caution that this is may be due to the model misspecification.

Elyasiani et al. (2002) not only examine the determinants of debt maturity but also the interdependent relationship between leverage and debt maturity using a simultaneous equation model. They find a negative correlation between a firm's debt maturity and its growth opportunities. In fact, it is the leverage decision which is affected by growth opportunities. They also document that industrial firms with higher growth opportunities are inclined to issue shorter term maturity of debt or bonds. The coefficient on the leverage ratio in the debt maturity regression and the coefficient on debt maturity in the leverage regression are both significantly positive. Therefore, there is a positive complementary between leverage and debt maturity.

Johnson (2003) utilizes a simultaneous equations model where the leverage and debt maturity are endogenous variables while the market-to-book, asset maturity, firm size, volatility, net operating loss carryforwards dummy, investment tax credit dummy and abnormal earnings are exogenous variables. The study covers 4,945 different firms during the 1986-1995 period. The results reveal that short-term debt maturity attenuates the negative effect of growth opportunities on leverage. The study also find complementary with negative sign between leverage and short-term maturity

which indicates that there is simultaneity in negative direction between leverage and short-term maturity.

Billett et al. (2007) investigate the effect of growth opportunities on its joint choice of leverage, debt maturity and covenants. In a sample of over 15,000 debt issues during the period from 1960 to 2003, they find that covenant protection is increasing in debt maturity, leverage and also growth opportunities. They also found that covenant protection significantly undermines the negative correlation between leverage and growth opportunities. Their evidence suggest that firms use covenants to control stockholder-bondholder conflicts over the exercise of growth option, and that short-term debt and restrictive covenants are substitutes in controlling these conflicts.

Sunarsih (2004) replicates the simultaneous equations framework to test the relationship between leverage and debt maturity policies in the Indonesian manufacturing industry. Using 130 firms listed on the Jakarta Stock Exchange during the 1994-1998 period, the study aims to identify factors affecting the simultaneity of leverage and debt maturity policies. The results from the analysis using the 2SLS regression with three exogenous variables show that leverage and debt maturity policies have a positive simultaneous relationship which means that there is a complementary direction of relationship between both of them. On testing the exogenous variables simultaneously, the results indicate that the exogenous variables that have a significant effect on leverage are firm size and debt tax shield whilst the exogenous variables that have a significant effect on debt maturity are firm size, asset maturity and signaling effects.

The above discussion reveals that there exists a research gap in the area under study. Therefore, the aim of this study is to add to the existing body of knowledge on another test of simultaneity between leverage and debt maturity. This study will focus on sample of Malaysian firms and use several proxies based on the capital structure and debt maturity theories.

Table 2.3: *Summaries of Empirical Studies for Capital Structure*

Empirical Evidence for Capital Structure			
Author	**Purpose of Research**	**Data Description**	**Findings**
Chen (2004)	This study aims to explore the determinants of capital structure of Chinese-listed companies.	• Sample Period: 1995-2000 covering 77 Chinese public listed companies. • Dependent Variables: leverage and long-term leverage • Independent Variables: profitability, size, growth opportunities, asset structure, cost of financial distress (EVOL), non-debt tax shield (NDTS) effects.	• The result shows that profitability, size, growth, and NDTS are significantly related to leverage. • There is a negative relationship between profitability and leverage under the Pecking order theory • Trade-off model has limited explanatory power because the effect of financial distress is not significant.
De Jong et al. (2008)	This study analyzes the important factors in leverage choice of sample firms around the world.	• Sample Period: 1997-2001 covering 11,845 firms in 42 countries. • Dependent Variable: leverage • Independent Variable: tangibility, business risk, tax rate, firm size, growth opportunities, profitability, and liquidity.	• The study shows that the control variables like tangibility, firm size, risk, growth opportunities and profitability have significant effects on firms' capital structure across the countries
Gurcharan (2010)	This study investigates the determinants of capital structure among sample firms in ASEAN countries, namely Malaysia, Indonesia, Philippines and Thailand.	• Sample Period: 2003-2007 covering 55 firms in four selected ASEAN countries • Dependent Variable: leverage • Independent Variables: profitability, growth, NDTS, firm size, size of banking industry, size of stock market, GDP growth rate and annual inflation rate	• The study find that profitability and growth opportunities for all selected ASEAN countries exhibit significant inverse relationship with the leverage. • NDTS has a significant negative impact on leverage for Malaysia companies only. • Firm size shows a positive significant effect on firms in Indonesia and Philippines.

Table 2.4: *Summaries of Empirical Studies for Debt Maturity*

Empirical Evidence for Debt Maturity			
Author	**Purpose of Research**	**Data Description**	**Findings**
Barclay and Smith (1995)	This study examines the determinants of corporate debt maturity structure based on three categories: contracting cost hypothesis, signaling hypothesis and tax hypothesis.	• Sample Period: 1974 to 1992 (U.S. firms) • Dependent Variable: debt maturity • Independent Variables: Market-to-book, regulation dummy, log of firm value, abnormal earnings and term structure.	• Firms with more growth option issue more short- term debt. • Regulated firm issue more long-term debt because regulation reduces the firm's discretion over corporate investment policy, thus controlling the underinvestment problem.
Stohs and Mauer (1996)	This study examines empirical determinants of debt maturity structure using a maturity structure measure that incorporates detailed information about all of a firm's liabilities.	• Sample Period: 1980 to 1989 (U.S firms) • Dependent Variable: debt maturity • Independent Variables: market to book ratio, size, changes in earnings per share, asset maturity, tax rate, earnings variability, term structure and leverage.	• Growth opportunities, firm size, earnings per share, asset maturity and leverage have significant effects on debt maturity. • Moderate support for agency cost theory that debt maturity is used to control conflicts between equity holders and bondholders.
Ozkan (2002)	This study investigates the empirical determinants of corporate debt maturity structure of UK companies.	• Sample period: 1986-1996 (U.K. firms). • Dependent Variable: debt maturity • Independent Variable: market to book, asset maturity, size, variability, effective tax rate and abnormal profit.	• Debt maturity structure is positively related to size and asset maturity of firms. • There is also support for hypothesis that volatility of the value of firms and agency cost exert a negative impact on debt maturity. • The findings do not offer any support for the view that taxes affect debt maturity decision for signaling purpose.

Table 2.5: *Summaries of Empirical Studies for Simultaneity between Leverage and Debt Maturity*

Empirical Evidence for Simultaneity between Leverage and Debt maturity.			
Author	**Purpose of Research**	**Data Description**	**Findings**
Elyasiani et al. (2002)	This study estimates a simultaneous equations model between leverage policy and debt policy.	• Sample Period: 1973-1994 • Dependent Variables: leverage and debt maturity • Independent Variables: Market-to-book ratio (M/B), log of M/B, asset maturity, commercial paper dummy, return on assets, intangible assets ratio, average tax rate and NOL carryforwards dummy.	• Industrial firms that have more growth opportunities will tend to issue shorter term debt and vice versa. • The coefficient on the leverage ratio in the debt maturity regression and the coefficient on debt maturity in the leverage regression are both significantly positive.
Barclay et al. (2003)	This study examines theories of simultaneity between leverage and debt maturity focusing more on a firm's investment opportunity sets and regulatory environments.	• Sample Period: 1980-1999 • Dependent Variables: leverage and debt maturity • Independent Variables: firm size, asset tangibility, asset maturity, marginal tax rate, NOL carryforwards and commercial paper dummy.	• Firm size and marginal tax rate are positive but only the tax rate coefficient is statistically significant. • The coefficients on profitability and growth opportunity are negatively significant and the coefficient on tangibility, regulation dummy and NOL are positively significant. • However, the coefficient on debt maturity and leverage in both equations are not complementary to each other

Johnson (2003)	This study empirically investigates how debt maturity affects the relationship between leverage and growth opportunities and liquidity risk.	Sample Period: 1986 -1995 Dependent Variables: leverage and debt maturity Independent Variables: fixed asset ratio, profitability, long firm size, volatility, investment tax credit dummy, NOL carryforward dummy, regulated firm dummy, abnormal earnings, market to book, asset maturity, term structure and rated firm dummy.	• Short-term debt maturity attenuates the negative effect of growth opportunities on leverage. • The study also find complementary with negative sign between leverage and short-term maturity which indicates that there is simultaneity in negative direction between leverage and short-term maturity.
Sunarsih (2004)	This study tests the simultaneous relationship between leverage and debt maturity of manufacturing firms in Indonesia.	Data period :1994-1998 Dependent Variables: leverage and debt maturity Independent Variables: investment opportunity set, firms size, signaling effect, non-debt tax shield and asset maturity.	• Leverage and debt maturity policies have a positive simultaneous relationship which means that there is a complementary direction of relationship between both of them. • The exogenous variables that have a significant effect on leverage are firm size and debt tax shield whilst those of debt maturity are firm size, asset maturity and signaling effects.
Billet et al. (2007)	This study investigates the effects of growth opportunities in a firm's investment opportunity set on its joint choice of leverage, debt maturity and covenants.	Sample Period: 1960-2003 Dependent Variables: leverage, maturity and covenant index Independent Variables: weighted covenant index, M/B, fixed assets, profitability, size, volatility, abnormal earnings, asset maturity, term premium, proportion of regulated firm-years, proportion of firm-years with Altman's $Z < 1.81$, investment tax credit, NOL, debt rating and commercial paper dummy.	• A negative relationship between leverage and growth opportunities is significantly attenuated by covenant protection. • Firms use covenants to control stockholder-bondholder conflicts or can mitigate the agency cost of debt for high growth firms.

Table 2.6: *Summaries of Prior Studies*

Authors/ Proxy	Leverage					Debt maturity					Simultaneity between Leverage and Debt Maturity					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	**This study**
Leverage							✓		✓	✓	✓	✓	✓	✓	✓	✓
Debt Maturity											✓	✓	✓	✓	✓	✓
Market-to-book	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regulation						✓		✓					✓		✓	✓
Firm Size	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Profitability (ROA)	✓	✓	✓	✓	✓						✓	✓	✓		✓	✓
Tangibility	✓			✓	✓							✓			✓	✓
Effective Tax Rate									✓	✓	✓	✓			✓	
NOL Dummy											✓	✓	✓		✓	✓
Volatility		✓		✓						✓			✓		✓	
NDTS		✓	✓	✓									✓	✓	✓	
Abnormal Earnings						✓		✓					✓	✓	✓	✓
Asset Maturity							✓		✓	✓	✓	✓	✓	✓	✓	✓
Commercial Paper Dummy											✓	✓			✓	
Term Structure						✓	✓	✓	✓				✓			✓
Liquidity			✓		✓											
Risk			✓		✓											

Note: A= Rajan and Zingales (1995), B = Titman and Wessels (1988), C = Ozkan (2002), D = Chen (2004), E = De Jong et al. (2008), F = Barclay and Smith (1995), G = Stohs and Mauer (1996), H = Guedes and Opler (1996), I = Johnson (1997), J = Stephen et al. (2011), K = Elyasiani et al. (2002), L = Barclay et al. (2003), M = Johnson (2003), N = Sunarsih (2004), O = Billet et al. (2007)

2.4 CONCLUSION

This chapter reviews the theories and empirical evidence regarding the determinants of simultaneity between leverage and debt maturity. In other words, firms could decide whether to have higher leverage or lower leverage and also whether to use long-term debt or short-term debt to finance their project or investment.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research design and methodology used to achieve the objectives of the study. Section 3.2 describes the population and study sample while Section 3.3 explains the model, variable definition and formula to compute the variable (dependent variable and independent variables). Section 3.4 presents the data collection. Section 3.5 provides the data analysis of this research while Section 3.6 is about equations or model of this study. Finally, Section 3.7 summarizes this chapter and Section 3.8 closes the chapter.

3.2 SAMPLE DESCRIPTION

The determination of the sample is based on the criteria set out below:

3.2.1 POPULATION

The financial data are obtained from *Datastream* and the industrial classifications are derived from Bursa Malaysia. The data for month-end yields of Malaysian Government Securities (MGS) and Treasury-bills (T-bills) are sourced from the Bank Negara Malaysia's website. The population of this study consists of companies listed on Bursa Malaysia from 1999 to 2010. The total number of listed companies is 850 from 12 different industrial sectors, namely plantation, property, consumer, construction, trading/services, technology, mining, industrial products, hotels, infrastructure project, finance and Real Estate Investment Trusts (REITs).

3.2.2 SAMPLE

The sample is derived based on a purposive sampling technique. This technique is used to select the sample based on specific criteria and certain consideration adjusted to the purpose of study. The initial sample used in this study comprises of 850 companies listed on Bursa Malaysia. The target sample in this study must meet the following criteria: first, the companies are non-financial firms listed on Bursa Malaysia; and second, the companies must have continuously published their financial reports from 1999 to 2010. A total of 51 firms in the financial sector are excluded because of their financial structures are likely to be influenced by different factors (e.g. capital adequacy regulations) than other non-financial firms. In addition, 21 firms are excluded due to incomplete data. Therefore, the final sample size for this study consists of 778 listed firms (see Table 3.1).

Table 3.1: *List of Sample Data*

SAMPLE OF STUDY BASED ON INDUSTRIAL SECTOR			
Firms in the sample	No.	**Excluded Firms**	No.
1. Plantation	40	11. Finance	36
2. Property	87	12. REITs	15
3. Consumer	141		
4. Construction	46	**Total no. of financial firms**	51
5. Trading/Services	167		
6. Technology	31	**Firms with incomplete data**	21
7. Mining	1		
8. Industrial Products	254		
9. Hotel	4		
10. Infrastructure Projects	7		
Total no. of firms in the sample	**778**	**Total no. of excluded firms**	**72**

3.3 THEORETICAL FRAMEWORK

The theoretical framework of this study is to show the link between control variables to leverage and debt maturity. Independent variables and dependent variables are designed to illustrate the actual situation as shown in Figure 3.1 and 3.2 as a single equation for capital structure and debt maturity respectively and Figure 3.3 depicts the 2SLS regression model. In this research framework, the two dependent variables are leverage and debt maturity while the independent variables consist of growth opportunities, regulated firm, firm size, profitability, tangibility, effective tax rate, NOLs dummy, volatility, abnormal earnings, asset maturity and term structure. The theoretical models which include all respective variables are shown as follows:

Figure 3.1*: Research Framework for Capital Structure under Single Equation Method*

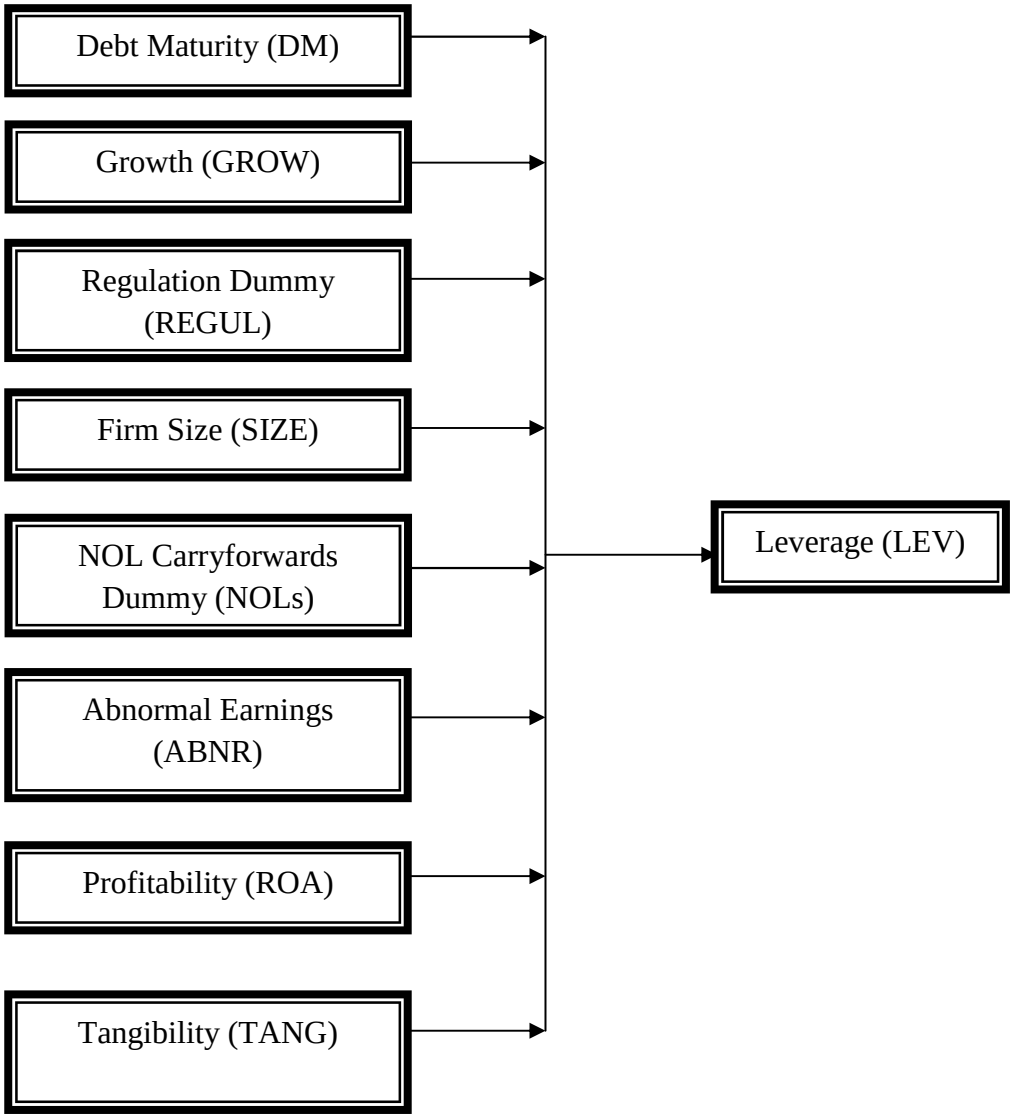


Figure 3.2: *Research Framework for Debt Maturity under Single Equation Method*

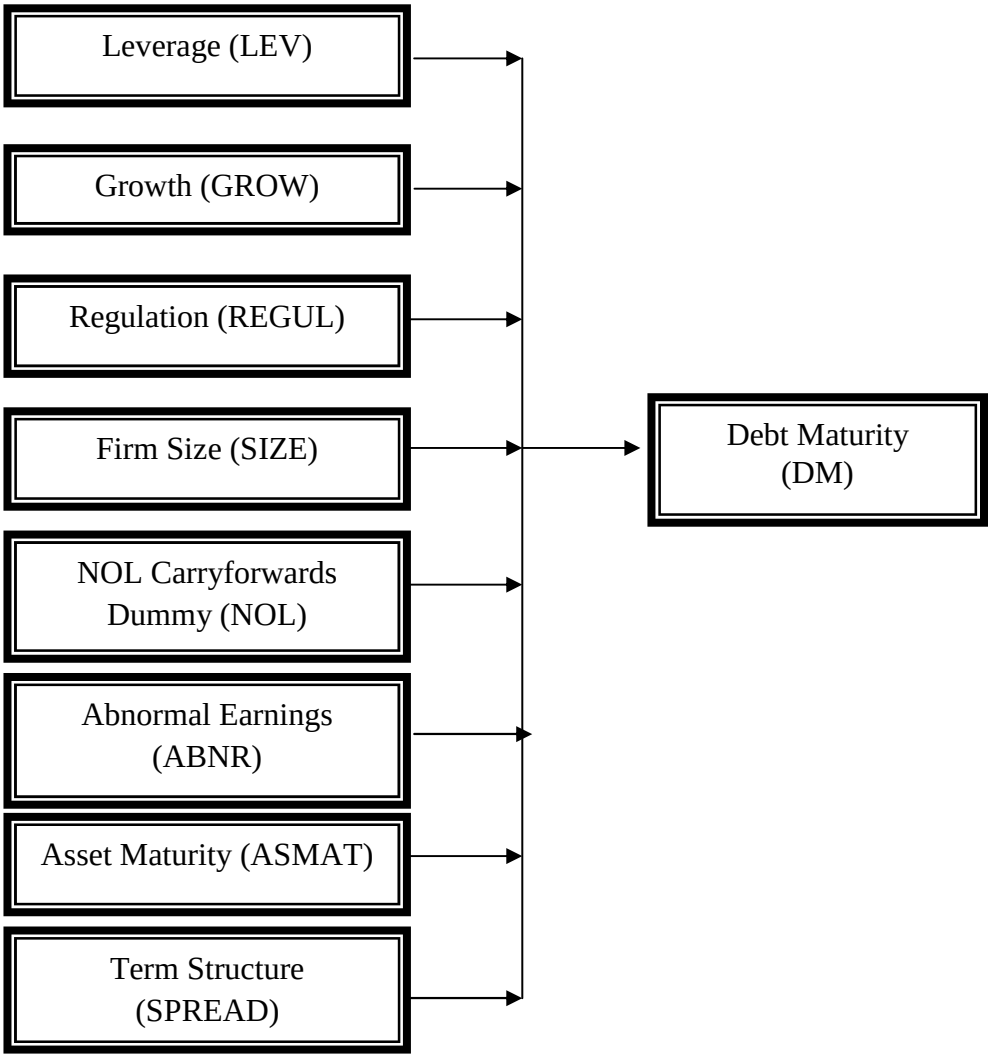
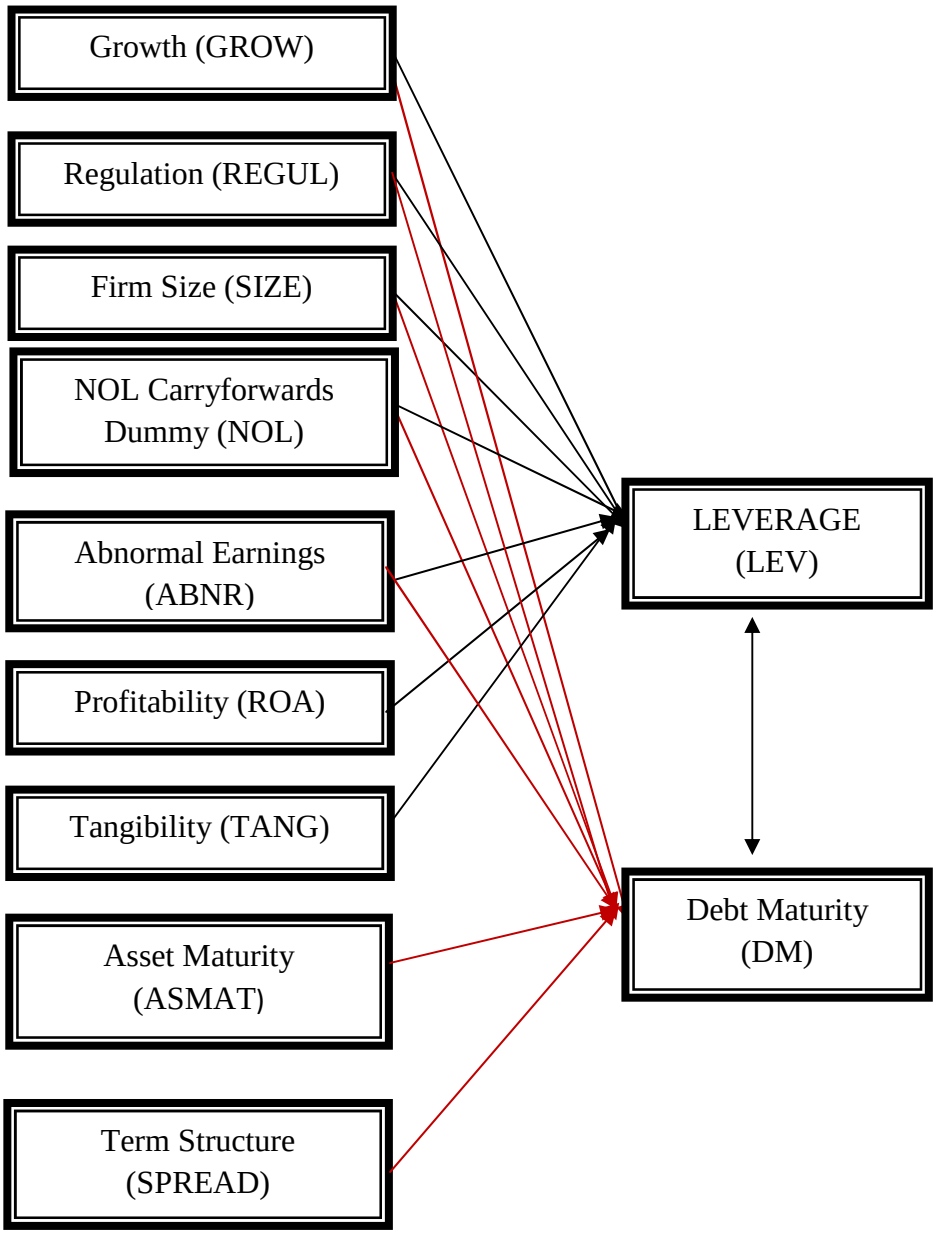


Figure 3.3: *Research Framework for Simultaneity between Leverage and Debt Maturity (2SLS)*



3.3.1 SIMULTANEOUS RELATIONSHIP BETWEEN LEVERAGE AND DEBT MATURITY

This part discusses the relationship between the control variables on leverage and debt maturity. This will enable conclusions to be made on the influences of each variable on the leverage and debt maturity. This part also tests the hypothesis formulated for each variable.

Johnson (2003) argues that there exists a positive relationship between leverage and longer term debt maturity. These simultaneous equation results are consistent with the single equation model done by Barclay and Smith (1995) who find that firms with longer maturity have higher leverage. The relationship is also consistent with Stohs and Mauer (1996) and Barclay et al. (1997) that find negative relationship between leverage and short-term maturity or positive relationship between leverage and long-term maturity. Therefore the following hypothesis is tested:

H1a : Leverage has a positive relationship with long-term debt maturity

H1b : Debt Maturity has a positive relationship with leverage

3.3.2 THE RELATIONSHIP BETWEEN CONTROL VARIABLES TO LEVERAGE

A. THE RELATIONSHIP BETWEEN GROWTH OPPORTUNITIES TO LEVERAGE

Theoretical researches generally suggest that leverage is significantly positive to growth opportunities. According to signaling theory, high performing firms are capable of using more leverage financing since leverage has its dead weight costs, which make less valuable firms more likely to fall into bankruptcy (Chen, 2004). The signaling theory predicts that firms with higher earnings with good growth prospect will use higher leverage. Therefore, the following hypothesis is tested:

H2 : Growth opportunity has a positive relationship with leverage

B. THE RELATIONSHIP BETWEEN FIRM SIZE TO LEVERAGE

Several studies have been conducted to determine whether there is a relationship between leverage and firm size. Titman and Wessels (1998), Crutchley and Hansen (1984) and Rajan and Zingales (1995) argue that the possibility of a large company that went bankrupt is small, so size has a positive effect on the level of debt taken. Many theoretical studies suggest there is a positive correlation between firm size and leverage. Chang and Rhee (1990) and Baskin (1989) said that large companies have better access to debt capital markets. Therefore, firm size has positive influence on financial leverage.

In general, larger firms have more stable cash flow and often more diversified and thus, they have a smaller probability of facing bankruptcy compared to smaller ones, ceteris paribus. Both arguments suggest that size should be positively significant to leverage. Also, many researcher including Stulz (1990), Harris and Raviv (1990), Poitevin (1989) and Noe (1988) suggest that leverage is positive to the value of firms in which leverage will increase together with the value of firms. This is in line with Rajan and Zingales (1995) and Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001) who generally find that leverage is positively correlated with company size. Therefore, the following hypothesis is tested:

H3 : Size has a positive relationship with leverage

C. THE RELATIONSHIP BETWEEN NOL CARRYFORWARDS DUMMY TO LEVERAGE

Elyasiani et al. (2002) state that if firms with NOLs have low tax benefits of debt, a negative relationship can be expected between NOLs and leverage. Firms with higher net operating loss will have lower leverage to enable them to manage their debt and pay it on time.

Generally, leverage is negatively correlated to NOLs dummy. This is a direct implication of the trade-off theory of Deangelo and Masulis (1980). Therefore, the following hypothesis is tested:

H4 : NOLs dummy has a negative relationship with leverage

D. THE RELATIONSHIP BETWEEN REGULATION TO LEVERAGE

Capital structure plays an important role in assessing regulation due to the interaction between the investment and financial decisions of a regulated firm and also the pricing choices of regulators (Spigel & Spulber, 1994). A number of studies suggest that rate regulation creates an incentive for regulated firms to increase their level of debt and there exists a positive relationship between regulated firms and leverage.

In a study conducted by Bradley, Jarrell, and Kim (1984) from 1962-1981 covering 25 industries, they find that regulated firms like telephone, electric and gas utilities are consistently among the most highly leveraged firms. To reduce debt agency and increase optimal leverage, the managers of regulated firms always have less discretion over their investment decision (Smith, 1986). This means that regulated firms always increase optimal leverage to reduce the agency risk. Besley and Bolton (1990), in their study, survey 27 regulatory agencies and 65 utilities and find that approximately 60% of regulated firm and utilities surveyed believed that an increase in debt is relative to equity increases in regulated industries.

Barclay and Smith (1995) argue that regulated firms can borrow longer term as agency problem are less severe. It is because regulated firms with less discretion in investment decision can minimize the agency cost problem. Therefore, the following hypothesis is tested:

H5 : Regulation has a positive relationship with leverage

E. THE RELATIONSHIP BETWEEN ABNORMAL EARNINGS TO LEVERAGE

This study also looks at the relationship between the signaling effects of debt by using the abnormal earnings as a proxy of signaling effect. According to signaling theory, firms with higher returns always optimize their leverage because higher returns always give positive signal to the market (Flannery, 1986 & Diamond, 1993).

Megginson (1977) states that the corporate financial decisions made by managers are often associated with a signaling effect. Ross (1977) argues that the use of debt in capital structure by profitable companies can give signal about the performance of these companies. It is unlikely that companies that announce their capital structure to the public would face bankruptcy or have financial distress than companies which are less profitable. Optimism of companies about the future will be indicated by an increase in the stock price.

Research conducted by Smith (1986) suggests a negative effect by the issuance of shares as a substitute for issuing debt to the stock price and stock return. Hence, it is clear that signaling effect will give positive signal if companies use debt to finance their activities. Therefore, the following hypothesis is tested:

H6 : Abnormal earning has a positive relationship with leverage

F. THE RELATIONSHIP BETWEEN PROFITABILITY TO LEVERAGE

According to the pecking order theory, profitability negatively affects leverage (Myers, 1977). This is supported by Megginson (1997) who suggests the tendency of profitable firms to have an inverse relation with leverage. In other words, firms which are profitable tend to have smaller amount of loans.

Furthermore, this is in line with Titman and Wessels (1988) and Fama and French (2002) who find a negative relationship between profitability and leverage. Barclay et al. (2003) argues that the agency cost model of capital structure predicts that an increase in profitability will result in a lower leverage. Therefore, the following hypothesis is tested:

H7 : Profitability has a negative relationship with leverage

G. THE RELATIONSHIP BETWEEN TANGIBILITY TO LEVERAGE

The literatures on the relationship between tangibility and leverage suggest that tangibility is positively related to leverage. If a firm has higher asset tangibility, then these assets can be used as collateral, reducing the risk faced by lender such as suffering from agency cost of debt. Therefore, high leverage is expected to be associated with high fraction of tangible assets. In the case of bankruptcy, the expected value of tangible assets should be higher than intangible assets.

Harris and Raviv (1990) suggest that leverage should increase with liquidation value and this is supported by Williamson (1988). Both of them suggest that tangibility is positively related to leverage.

Furthermore, empirical studies that confirm the above theoretical prediction include those conducted by Rajan and Zingales (1995) and Wald (1999) who find positive relationship between leverage and tangibility. In this study, tangibility is measured as fixed assets divided by total assets. Therefore, the following hypothesis is tested:

H8 : Tangibility has a positive relationship with leverage

3.3.3 THE RELATIONSHIP BETWEEN CONTROL VARIABLES TO DEBT MATURITY

A. THE RELATIONSHIP BETWEEN GROWTH OPPORTUNITIES TO DEBT MATURITY

In general, firms with higher growth opportunities prefer to use smaller proportion of long-term debt whereby they control their underinvestment activities and agency cost through short-term debt (Myers, 1977 & Ozkan, 2002). Their finding was consistent with Arslan and Karan (2006) whereby the coefficient was negatively significant in their study. They state that firms with greater growth opportunities prefer to use shorter maturity to solve the underinvestment problem.

Leland and Thoft (1996) show that the optimal capital structure of a firm also depends on debt maturity and it is lower when the firm is financed by short-term debt. Firms that issuing short-term debt do not exploit tax benefits as completely as firms with long-term debt; it is more likely that they will have less incentive to raise the

firm risk after the issue. This is in turn related to reducing the agency costs. Thus, the empirical prediction is that firms with higher growth opportunities will employ higher proportion of short-term debt in their capital structure than long-term debt (Ozkan, 2002). Therefore, the following hypothesis is tested:

H9 : Growth opportunity has a negative relationship with debt maturity

B. THE RELATIONSHIP BETWEEN FIRM SIZE TO DEBT MATURITY

The literature suggests that there is a positive relationship between leverage and size. Marsh (1982) finds that firms with larger size more often choose long-term debt maturity, whereas small firms will choose short-term debt. Bevan and Danbolt (2000) in their research document a positive effect of firm size on debt maturity. Thus, small firms are expected to use less long-term debt than the larger firms.

Titman and Wessels (1998) state that the possibility of large companies getting into bankruptcy is small and thus, it can positively affect the level of debt taken by the companies. Large firms, in general, tend to have more stable cash flows and more diversified assets. Thus, the firm size is expected have an inverse relationship on the probability of default, which suggests that large firms would be expected to carry more debt (Barclay et al., 2003). Diamond (1993) also argues that large established firms have better reputation in the debt market, which also allows them to carry more debt.

This above finding is supported by Sunarsih (2004) who find a positive relationship between firm size and debt maturity. It is clear that firm size has a positive relationship with the debt maturity. This means that large companies will use long-term debt more than small companies do. The latter prefer to use short-term debt maturity. Therefore, the following hypothesis is tested:

H10 : Size has a positive relationship with debt maturity

C. THE RELATIONSHIP BETWEEN NOL CARRYFORWADS DUMMY TO DEBT MATURITY

The net operating loss carryforwards dummy (NOLs) equals to one for firms with net operating loss carryforwards and others, zero. Johnson (2003) argues that firms that have greater net operating loss carryforwards tend to use short-term debt maturity. It means that there is a negative relationship between NOLs dummy and the debt maturity. If firms with NOLs have low tax benefits of debt, the negative coefficient will affect the debt maturity. Therefore, the following hypothesis is tested:

H11 : NOLs dummy has negative relationship with debt maturity

D. THE RELATIONSHIP BETWEEN REGULATED FIRMS TO DEBT MATURITY

Barclay et al. (2003 state that optimal debt maturity should be longer for regulated firms because regulatory control restrict managers' discretion over corporate investment decisions and thereby able to control aspects of underinvestment issues.

The positive relationship between regulated dummy and debt maturity is also supported by Barclay and Smith (1995) who argue that regulated firms can borrow longer leverage due to less discretion in investment decision, and also less agency problem.

Flannery (1986) argues that utility firms are expected to issue longer term debt maturity than other industrial firms. In addition, Smith (1986) agrees with the prediction of positive coefficient between utility-firm dummy and debt maturity. Thus regulated firms choose longer term debt maturity because they are subject to a smaller agency cost. Therefore, the following hypothesis is tested:

H12 : Regulation has a positive relationship with debt maturity

E. THE RELATIONSHIP BETWEEN ABNORMAL EARNINGS TO DEBT MATURITY

Companies with higher returns will give positive signal to the market. Hence, firms with positive information about future prospect prefer to use short-term debt that can be refinanced after information is revealed (Flannery, 1986).

According to signaling theory, the selection of maturity structure selected by managers will provide useful information to investors. This in line with the opinion of Flannery (1986) who states that the selection of the maturity structure of the debt means insiders have better information than outside investors. Flannery (1986) further states that strong firms will choose to issue short-term debt maturity than weak

firms do. This is because taking short-term debt will push the firm to take more risk to roll-over the debt after releasing information about the company to the public. Meanwhile, weak firms will choose to take low risk by issuing long-term debt.

Diamond (1991) suggests that firms with high credit rating will issue short-term debt and the firms with low credit rating will chose to issue long-term debt maturity. Meanwhile, Barclay and Smith (1995) argue that based on the signaling theory, more-valuable firm will issue short-term debt with high leverage compared with the less-valuable firm. Therefore, the following hypothesis is tested:

H13 : Abnormal earnings has a negative relationship with debt maturity

F. THE RELATIONSHIP BETWEEN ASSET MATURITIES TO DEBT MATURITY

If the debt has a maturity that is longer than the maturity of its assets, then there is a tendency for companies that do not have enough cash to pay debts until it matures. Conversely, if the debt has a maturity shorter than maturity of its assets, then companies which do not have enough funds will choose to refinance according to priority. This argument is supported by Myers (1977) who provides a theoretical justification of the general practices of an adjustment to the life of asset (asset maturity) issued by the company with debt to fund it, as this allows for repayment in accordance with the decline in value of assets in the future.

This argument is also in line with Stohs and Mauer (1996) who assert that when debt maturity is shorter than asset maturity, the firm may not have sufficient cash to meet its obligations when they fall due; in other words, when the maturity of debt is longer than its asset maturity, the firm will have debt obligations to meet while cash flows from asset stop. Therefore, the following hypothesis is tested:

H14 : Asset maturity has positive relationship with debt maturity

G. THE RELATIONSHIP BETWEEN TERM STRUCTURES TO DEBT MATURITY

According to tax hypothesis, the firm's debt maturity will increase with the slope of the yield and they are expected to have a positive relationship, which are supported by Barclay and Smith (1995) and Stohs and Mauer (1996).

Kim et al. (1995) state that the increase in the slope of term structure and the interest rate volatility can make firms to choose longer term debt maturity in their capital structure. Hence, term structure is expected to have a positive relationship to debt maturity. Therefore, the following hypothesis is tested:

H15 : Term structure has a positive relationship with debt maturity

3.4 DEFINITION AND MEASUREMENT

Based on the research problems and development of hypotheses, the variables that are examined in this study are as follows:

a) Dependent Variables

In this study, measurement of variables used can be explained as follows:

1. Leverage is the decision taken to determine the amount of debt that will be taken to resolve the differences between the interests of shareholders by managers. The amount of leverage is determined by the total debt over total assets.

$$Debt\ Ratio = \frac{Total\ Debt}{Total\ Assets}$$

2. Debt maturity is the maturity of corporate debt policy. Debt Maturity is determined by the long-term debt over total debt.

$$Debt\ Maturity = \frac{Long\ Term\ Debt}{Total\ Debt}$$

b) Independent Variables

1. Growth opportunities: It refers to the opportunities to invest in profitable projects. Growth opportunities (GROW) is measured as a ratio of book value of total assets plus the market value of equity minus the book value of equity over the total assets.

$$GROW = \frac{TA + Market\ Capitalization - Common\ equity}{Total\ Assets}$$

2. Regulated firms are firms engaged in utilities like natural gas, electricity, water services, cable TV and other industries. The measurement of regulated firms is by using a dummy variable, 1 for utility companies and others, 0 (see Appendices).

3. Firm size is the size or amount of assets owned by the company. Firm size is measured by using the natural logarithm of total assets of each company.

4. Profitability is the ability of a company to make a profit. One of the proxies of profitability is a pre-tax profit margin that is used to measure the company's net income before taxes. For this study, return on assets (ROA) is used as a measure of profitability of Malaysian firms.

$$\text{ROA} = \frac{Net\ Income}{Total\ Asset}$$

5. Tangibility is a characteristic that an asset can be used as collateral to secure debt. Tangibility is the ratio of tangible assets (the sum of fixed assets and inventories) divided by total assets.

$$TANGIBILITY = \frac{Tangible\ Asset}{Total\ Asset}$$

6. Net operating loss carryforwards (NOLs) dummy equals one (1) for firms with net operating loss carry forwards and zero (0) otherwise.

7. Abnormal Earnings refer to the difference between earnings per share (EPS) in year t + 1 and year divided by the EPS in year t.

$$Abnormal\ earnings = \frac{(EPS\ t+1) - (EPS\ t)}{EPS\ t}$$

8. Asset Maturity is the period or age of the corporate assets with debt incurred to finance them. Asset maturity can be measured by the following formula:

$$Asset\ Maturity = \frac{Net\ PPE\ (Property, Plant\ \&\ Equiptment)}{Depreciation, Depletion, Amortization}$$

9. Term structure is represented as the difference between the month-end yields on long-term 10 year-government bonds (MGS) and three-month Treasury bills and matched with the firm's fiscal year end.

3.5 DATA COLLECTION TECHNIQUES

Data collection techniques are performed in the following ways:

3.5.1 SOURCES AND TYPES OF DATA

The type of data used in this research is secondary data obtained from *Datastream.* This study is a panel data analysis that uses annual data of leverage, debt maturity and nine control variables, namely growth opportunities, regulated firm, firm size, profitability, tangibility, NOLs dummy, abnormal earnings, asset maturity and term structure. The data covers the period from January 1999 to December 2010. In addition, this study also uses the online content from the websites of Bursa Malaysia (www.bursamalaysia.com) and Securities Commission (www.sc.com.my).

3.5.2 DATA COLLECTION

Data collection is carried out as follows:

1) Library Research

   This study is started by reading and studying the literatures such as books, journals, newspapers, and other assorted written sources related to the research topic.

2) Fieldwork

   The data used in this study is secondary data from financial statements provided by *Datastream* available in the library of Universiti Utara Malaysia.

3.6 DATA ANALYSIS AND HYPOTHESIS TESTING

To explain the relationship between variables and to test the hypothesis that have been developed, this study uses two-stage least squares (2SLS) of simultaneous equations model with the aid of computer programs, namely *Eviews* 7 and *Microsoft Excel 2007*.

The parameter of independent variables is estimated by using panel data analysis combining cross-sectional and time-series data. The reasons for using panel data analysis are as follows:

1. Data is more informative and has greater variability and higher degree of freedom. Potential collinearity among explanatory variables could be reduced. Thus, it will produce efficient econometric estimation.
2. Panel data is able to analyze more complex behaviors that exist in the model and due to that, it does not require the classical assumption test (Gujarati, 2007).

3. Longitudinal data allow researchers to analyze using cross-sectional or time-series data. $\beta_{1,}$ μ_1 are regression coefficients to be estimated. In general, the regression model has the following form:

$$\mathbf{Y_{it}} = \boldsymbol{\alpha_1} + \boldsymbol{\beta\chi_{it}} + \boldsymbol{\mu_{it}} \quad (1)$$

Where:

i : 1 , 2 , ... n shows the cross section

t : 1, 2 , ... t shows at any given time

Yit : the value of the dependent variable from region *i* at time *t* where number of K on the χ_{it}, not including the constant term.

$\alpha_{.1}$: *individual effect* that is constant between time *t* and specific for each unit of cross-section *i*

β : coefficient of regression

it : confounding variables

The equation (1) above refers to the classical regression model. Panel data analysis comprises of three models, namely pooled least squares, fixed effects and random effects. This study employs Pooled Estimated Generalized Least Square (EGLS) and Autoregressive or commonly known as AR(1). The advantage of using EGLS with AR (1) is the ability to avoid the problem of autocorrelation and heteroscedasticity in the Ordinary Least Squares (OLS) model which brings high probability of inconsistency and biasness. OLS is typically suitable in small sample while the EGLS is appropriate for large sample. These studies also use huge number of observation in the data sample which is assumed normally distributed according to the Central Limit Theorem.

3.6.1 ANALYTICAL TECHNIQUES

Analytical techniques used in testing the hypotheses in this study are as follows:

A. TWO-STAGE LEAST SQUARES (2SLS) ANALYSIS

This technique is used to test the simultaneity between leverage and debt maturity as the dependent variable in order to determine the relationship of the two policies and the independent variables such as growth opportunities, regulated firm, firm size, NOL carryforwards, abnormal earnings, profitability, tangibility, asset maturity, and term structure that affect leverage and debt maturity. The basic model of leverage and debt maturity equation is formulated as follows:

$$LEV = \alpha_{1.0} + \alpha_{1.1}DM + \alpha_{1.2}GROW + \alpha_{1.3}REGUL + \alpha_{1.4}SIZE + \alpha_{1.5}NOL + \alpha_{1.6}ABNR + \alpha_{1.7}ROA + \alpha_{1.8}TANG + \epsilon_1 \quad (2)$$

$$DM = \alpha_{2.0} + \alpha_{2.1}LEV + \alpha_{2.2}GROW + \alpha_{2.3}REGUL + \alpha_{2.4}SIZE + \alpha_{2.5}NOL + \alpha_{2.6}ABNR + \alpha_{2.7}ASMAT + \alpha_{2.8}SPREAD + \epsilon_2 \quad (3)$$

Where:

LEV = Leverage
DM = Debt Maturity
GROW = Growth Opportunities
REGUL = Regulated Firm
SIZE = Firm Size
ROA = Profitability
TANG = Tangibility
NOL = Net Operating Loss carryforwards dummy
ABNR = Abnormal Earnings
ASMAT = Asset Maturity
SPREAD = Term Structure

Based on the two equations above, it can be seen that the debt maturity, in addition to being the dependent variable, can also become an independent variable in the leverage equation. While the leverage, in addition to being the dependent variable, can also become an independent variable on the debt maturity equation. This condition shows that leverage and debt maturity affect each other and it could occur simultaneously.

Gujarati (2007) states that in a simultaneous equations model, it is very likely that the dependent variable is correlated with the error term. In this case, the leverage variable is correlated with the $\epsilon 2$ and debt maturity variable is correlated with $\epsilon 1$. With these conditions, then the analysis using the OLS regression has the potential to produce estimates that are biased and inconsistent. Furthermore, it is said that 2SLS method is more appropriate to be used for simultaneous analysis since in this analysis all the variables are accounted as an overall system.

Before entering the stage of 2SLS analysis, each equation must meet the identification requirements. An equation is said to be identified only if the equation is uniquely expressed in statistical form, and produces a unique parameter estimate. According to Gujarati (2007), to fulfill these requirements, then a variable in the equation must be inconsistent with the insert or add or remove of some of independent or dependent variable into the equation.

For a simultaneous equations model containing two equations, the order and rank conditions can be stated as follows:

a) Order condition means that at least one of the exogenous variables in the system is excluded from the first equation.

b) Rank condition means that at least one of the exogenous variables excluded from the equation; thus, the equation must have a non-zero population coefficient in the second equation.

This study initially uses an order condition to identify the conditions. The order condition is divided into three parts which are under identified, exactly identified and over identified. The terms of an equation can be identified as simultaneous equations are as follows:

1. $K - k < m - 1$: under identification
2. $K - k = m - 1$: exact identification
3. $K - k > m - 1$: over identification

Where,

M = number of endogenous variables in the model

m = number of endogenous variables in each structural equation

K = number of predetermined variables in the model

k = number of predetermined variables in each structural equation

Based on these criteria, the identification of the simultaneous equations model in this study is as follows:

Table 3.2: *Identification of Simultaneous Equation Model*

Equation Model	K	K	M	Condition	Identification
Leverage	10	8	2	K – k = m – 1	Over identified
Debt Maturity	10	8	2	K – k = m – 1	Over identified

Sources : Ajija, et al. (2011), Cara Cerdas Menguasai Eviews

As shown in Table 3.2, all the equation in the model above shows that the model is over identified based on the order condition and rank condition. Once it has been determined that an equation is identified or over identified, the model can be estimated by the 2SLS method, where the 2SLS consists of exogenous variables appearing in the other equation.

In performing the analysis of simultaneous equations through the 2SLS method, there are two stages to be observed. The first stage is the OLS regression analysis which is performed for each equation with the aim of eliminating the correlation between the dependent variable with the error term. At this stage, the redirected value of each equation is generated. Predicted value in this case serves as an instrumental variable, which is a variable that explains the dependent variable in such a way that resembles the original dependent variable but uncorrelated with the error term (Gujarati, 2007). The first stage of 2SLS analysis in this study can be formulated as follows:

a. The First Stage

$$Lev = \alpha_{1.0} + \alpha_{1.1}DM + \alpha_{1.2}GROW + \alpha_{1.3}REGUL + \alpha_{1.4}SIZE + \alpha_{1.5}NOL + \alpha_{1.6}ABNR + \alpha_{1.7}ROA + \alpha_{1.8}TANG + \epsilon_1 \quad (4)$$

$$Lev = Lev^* + \mu_1 \quad (5)$$

Lev^* is estimated (predicted) value of leverage over all the independent variables indicating that the Lev^* does not correlate with the error term. μ_1 coefficient in the equation signifies the OLS residuals. The same procedure is also performed on the debt maturity equation. It is done as follows:

$$DM = \alpha_{2.0} + \alpha_{2.1} LEV + \alpha_{2.2} GROW + \alpha_{2.3} REGUL + \alpha_{2.4} SIZE + \alpha_{2.5} NOL + \alpha_{2.6} ABNR + \alpha_{2.7} ASMAT + \alpha_{2.8} SPREAD + \epsilon_1 \quad (6)$$

$$DM = DM^* + \mu 2 \quad (7)$$

DM^* is estimated (predicted) value of debt maturity for all the independent variables which show that DM^* does not correlate with the error term. μ_2 coefficient in the equation signifies the OLS residuals.

b. The Second Stage

The second stage of 2SLS is to perform a regression analysis on each equation by using leverage and debt maturity variables with its predicted value. Leverage and debt maturity equation will therefore change to:

$$Lev = \alpha_{1.0} + \alpha_{1.1} DM^* + \alpha_{1.2} GROWT + \alpha_{1.3} REGUL + \alpha_{1.4} SIZE + \alpha_{1.5} NOL + \alpha_{1.6} ABNR + \alpha_{1.7} ROA + \alpha_{1.8} TANG + \mu_{1*} \quad (8)$$

$$DM = \alpha_{2.0} + \alpha_{2.1} LEV^* + \alpha_{2.2} GROW + \alpha_{2.3} REGUL + \alpha_{2.4} SIZE + \alpha_{2.5} NOL + \alpha_{26} ABNR + \alpha_{2.7} ASMAT + \alpha_{2.8} SPREAD + \mu_{2*} \quad (9)$$

3.6.2 HYPOTHESIS TESTING

This part is important to answer the hypotheses that have been made before. Thus, testing of each hypothesis can be done in the following way:

Significance tests between independent variables (*GROW, REGUL, SIZE, ROA, TANG, NOL* and *ABNR)* and dependent variable (LEV) and also between independent variables (*GROW, REGUL, SIZE, NOL, ABNR, ASMAT* and *SPREAD*) and dependent variable (DM) can be performed either partially conducted by using the t-test, whilst to jointly test, it can be done using the F-test at 5% level ($\alpha = 5\%$).

a. T-test Statistics

T-test is a test of the coefficients of independent variables. Coefficient estimators need to be significantly different from zero or very small p-value. This test is performed to determine independent variables that partially have a significant influence on the dependent variables, as for the hypothesis was formulated as follows:

1. Variables like *GROW, REGUL, SIZE, NOL, ABNR, ROA* and *TANG* has significant affect on leverage.

   $H_0 : \beta1 = \beta2 = \beta3 = \beta4 = \beta5 = \beta6 = \beta7 = 0$

   (*GROW, REGUL, SIZE, NOL, ABNR, ROA,* and *TANG* has no effect on the leverage).

   $H_a : \beta1 = \beta2 = \beta3 = \beta4 = \beta5 = \beta6 = \beta7 \neq 0$

2. Variables like *GROW, REGUL, SIZE, NOL, ABNR, ASMAT,* and *SPREAD* has significant effect on debt maturity.

   $H_0 : \beta1 = \beta2 = \beta3 = \beta4 = \beta8 = \beta9 = \beta10 = 0$

   (*GROW, REGUL, SIZE, NOL, ABNR, ASMAT*, and *SPREAD* has no effect on debt maturity).

   $H_a : \beta1 = \beta2 = \beta3 = \beta4 = \beta8 = \beta9 = \beta10 \neq 0$

t-test calculated value can be obtained from the formula below:

$$t\ calculated = \frac{Coefficients\ regression\ (bi)}{Standard\ Error\ (bi)} \qquad (10)$$

If $t_{calculated} > t_{table}$, then Ho is rejected.

If $t_{calculated} < t_{table}$, then Ho is accepted.

b. F- test Statistics

F-test or test of the overall model is performed to see whether all the regression coefficients not equal to zero and thus, the model is accepted. The importance of F-test is to know that the independent variables simultaneously have a significant influence on the dependent variable as for the hypotheses were formulated as follows:

1. Variables like *GROW, REGUL, SIZE, NOL, ABNR, ROA* and *TANG* have significant effects on leverage.

   H_0: $\beta1 = \beta2 = \beta3 = \beta4 = \beta5 = \beta6 = \beta7 = 0$

   The independent variables (*GROW, REGUL, SIZE, NOL, ABNR, ROA* and *TANG*) do not have significant effects on the dependent variable (leverage).

   H_a: $\beta1 = \beta2 = \beta3 = \beta4 = \beta5 = \beta6 = \beta7 \neq 0$

2. Variables like *GROW, REGUL, SIZE, NOL, ABNR, ASMAT*, and *SPREAD* have significant effects on debt maturity.

   H_0: $\beta1 = \beta2 = \beta3 = \beta4 = \beta8 = \beta9 = \beta10 = 0$

   The independent variables (*GROW, REGUL, SIZE, NOL, ABNR, ASMAT*, and *SPREAD*) have no significant effect on independent variable (debt maturity).

   H_a: $\beta1 = \beta2 = \beta3 = \beta4 = \beta8 = \beta9 = \beta10 \neq 0$

F-test calculated value can be obtained from the formula below:

$$F\ calculated = \frac{R^2/(K-1)}{(1-R^2)/(N-K)}$$

If $F_{calculated} > F_{table}$, then Ho is rejected.

If $F_{calculated} < F_{table}$, then Ho is accepted.

3. Test of coefficient of determination (R^2)

The coefficient of determination (R^2) is useful to measure how much the role of the independent variables is jointly explaining changes in the dependent variables (leverage and debt maturity).

3.6.3 MULTICOLLINEARITY TEST

Multicollinearity test is aimed at finding the correlation between the independent variables in the regression model. Multicollinearity test is performed by using the Variance Inflation Factor (VIF) and *tolerance* values. *Cutoff* value that is commonly used to indicate the presence of multicollinearity is *tolerance* values < 0.10 or equal to the value of VIF > 10. VIF may also be calculated by the following formula:

$$VIF = \frac{1}{Tolerance}$$

Thus, if the VIF value is greater than 10, then there exists multicollinearity between the independent variables.

3.7 EXPECTED RELATION

The expected relation among the dependent variables and independent variables are shown in Table 3.3 while the summary of hypotheses is depicted in Table 3.4.

Table 3.3 *Expected Relation*

Symbol	Variable	Measurement	Expected Relation	
			LEV	DM
LEV	Leverage	$DEBT\ RATIO = \frac{TOTAL\ DEBT}{TOTAL\ ASSETS}$		(+)
DM	Debt Maturity	$DM = \frac{LONG\ TERM\ DEBT}{TOTAL\ DEBT}$	(+)	
GROW	Growth Opportunities	$GROW = \frac{TA + M.CAP - COMMON\ EQUITY}{TA}$	**(+)**	**(-)**
REGUL	Regulated Firm Dummy	The measurement of regulated firms are using dummy variable, 1 for utilities companies and others are 0.	**(+)**	**(-)**
SIZE	Firm Size	Firm size was measured by using the natural logarithm of total assets of each company	**(+)**	**(+)**
NOL	NOL Carryforwards Dummy	NOL carryforwards dummy equals one for firms with net operating loss carry forwards and zero otherwise.	**(-)**	**(-)**
ABNR	Abnormal Earnings	$ABNR = \frac{(EPS\ t+1) - (EPS\ t)}{EPS\ t}$	**(+)**	**(-)**
ROA	Profitability	$ROA = \frac{Net\ Income}{Total\ Asset}$	**(-)**	
TANG	Tangibility	$TANG = \frac{TANGIBLE\ ASSET}{TOTAL\ ASSET}$	**(+)**	
ASMAT	Asset Maturity	$ASMAT = \frac{NET\ PPE}{DEPRECIATION\ DEPLETION\ AMORTIZATIO}$		**(+)**
SPREAD	Term Structure	The difference between the month-end yields on long-term 10-year government bonds (MGS) and three-month Treasury bills and matched with the firm's fiscal year end.		**(+)**

Table 3.4: *Summary of Hypothesis*

Leverage Equation	
Hypothesis 1a	Debt maturity has a positive effect on leverage
Hypothesis 2	Growth opportunities have a positive effect on leverage
Hypothesis 3	Firm size has a positive effect on leverage
Hypothesis 4	NOL has a negative effect on leverage
Hypothesis 5	Regulated firm has a positive effect on leverage
Hypothesis 6	Abnormal earnings has a positive effect on leverage
Hypothesis 7	Profitability (ROA) has a negative effect on leverage
Hypothesis 8	Tangibility has a positive effect on leverage
Debt Maturity Equation	
Hypothesis 1b	Leverage has a positive effect on debt maturity
Hypothesis 9	Growth opportunities have a negative effect on debt maturity
Hypothesis 10	Firm size has a positive effect on debt maturity
Hypothesis 11	NOL has a negative effect on debt maturity
Hypothesis 12	Regulated firm has a positive effect on debt maturity
Hypothesis 13	Abnormal earnings has a negative effect on debt maturity
Hypothesis 14	Asset maturity has a positive effect on debt maturity
Hypothesis 15	Term structure has a positive effect on debt maturity

3.8 CONCLUSION

In this study, the sample data is analyzed using the 2SLS regression to figure out whether the model can support the proposed theories. This chapter reviews the collection of the data, theoretical framework, hypothesis development and the measurement of variables. The time frame of this study is from 1999 to 2010 covering all non-financial firms that are listed on Bursa Malaysia.

CHAPTER FOUR

ANALYSIS AND FINDINGS

4.1 INTRODUCTION

Chapter Four provides evidence for the factors that influence the determinants of simultaneity between leverage and debt maturity. In this chapter, the descriptive statistics is illustrated in Section 4.2. Section 4.3 shows the correlation matrix while Section 4.4 presents the result of multicollinearity test. Section 4.5 discusses the regression analysis, which represents the main findings of this study. Section 4.6 presents the summary of all regression analysis. Lastly, Section 4.7 concludes the chapter.

4.2 DESCRIPTIVE ANALYSIS

Table 4.1 reports the descriptive statistics for the entire sample which are used for the single equation and also simultaneous equations regression analysis. The data was analyzed by using *Eviews 7*, covering a total of 5721 observations which consist of leverage, debt maturity, growth opportunities, firm size, regulated firm, net operating loss carryforwards, abnormal earnings, profitability (ROA), tangibility, asset maturity and term structure.

The mean and median for leverage are 0.26 and 0.24 respectively; it means that on average, Malaysian firms only use 26.00% as leverage to finance their project. The mean for debt maturity is 0.39 which means that on average, the long-term debt represents 39% of the total debt incurred by Malaysian firms.

For growth opportunities, the mean is about 1.07, which signifies that investment opportunity is high in Malaysia. It is in line with a study conducted by Jensen (1986) which finds that firms with higher investment opportunity usually have high growth, active in investment, lower free cash flow and lower asset in place.

The mean value for firm size is RM12.78 million with the maximum and minimum values of RM18.45 million and RM7.71 million of assets respectively. Meanwhile, the average of NOLs during the observation period is relatively low at 0.24 with a standard deviation of 0.43. In this NOLs case, the result shows that the standard deviation is greater than its average. As the minimum value is smaller than its average (0.00) and the maximum value is greater than its average (1.00), this indicates that the spread of NOLs is unfavorable since the standard deviations that reflect the aberrations of the data variable is quite high which can lead to the biased regression result.

The mean of regulated firm is 0.03 with standard deviation about 0.17 which signals that the distribution of data is not normal. This also means that the utility firms or other regulated firms in Malaysia is relatively fewer in number than non-regulated firms. The abnormal earnings variables which are tested to see the signaling effect have an average figure of about 0.11 with the minimum value at -369.03 and the maximum value at 110.96. This data shows abnormal distribution and can produce biased result as well. Meanwhile, the mean figure of ROA stands at 3.94 with a standard deviation of 14.04, indicating that the firms are highly profitable. The average tangibility figure is 0.41 with a standard deviation of 0.21; this means that the data is normally distributed.

In addition, the means of asset maturity and term structure among Malaysian firms stand at 36.40 and 1.5 respectively. The high figure of asset maturity indicates that most Malaysian firms have lower depreciation on assets which implies that the firms have the ability to issue long-term debt maturity. Furthermore, the standard deviation of term structure is less than its average of about 0.93; it denotes that the lower the standard deviation from its average, the better the result will be since the data is normally distributed.

Table 4.1: Descriptive Statistics for Entire Sample

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
LEV	0.2640	0.2357	10.2731	0.0000	0.2872	5721
DM	0.3890	0.3453	1.0000	0.0000	0.3130	5721
GROW	1.0666	0.9090	19.1016	0.2372	0.7579	5721
SIZE	12.7792	12.5658	18.4518	7.7098	1.3385	5721
NOL	0.2381	0.0000	1.0000	0.0000	0.4259	5721
REGUL	0.0295	0.0000	1.0000	0.0000	0.1693	5721
ABNR	0.1134	0.0269	110.9639	-369.0370	5.5641	5721
ROA	3.9408	4.0800	771.4500	-93.4700	14.0380	5721
TANG	0.4063	0.3976	0.9875	0.0000	0.2069	5721
ASMAT	36.4067	13.3563	3352.3540	-2142.2590	112.9911	5721
SPREAD	1.5143	1.2940	4.0550	0.0390	0.9313	5721

Notes: The number of observations is 5806 in Equation 1 and 6024 in Equation 2 consisting of the sample of listed companies during the 1999-2010 period. LEV is generated by dividing total debt to total asset. DM is long term debt divided by total debt. GROW is total asset plus market capitalization then minus common equity, divided by total asset. REGUL used a dummy variable, 1 for utilities companies and other are 0. SIZE is measured by log of total assets. NOL carryforwards dummy equalsto 1 for net operating loss and 0 otherwise. ABNR is the difference between earnings in year *t+1* and *t*, then divided by earnings in year *t*. PROFIT is the ratio of EBITDA to total assets. TANG is tangible asset divide by total assets. ASMAT is the ratio of fixed assets to annual depreciation expenses. SPREAD is measured by the difference between the month-end yields on long term 10-year government bonds (MGS) and three-month Treasury-bills and matched with the firm's fiscal year-end.

4.3 CORRELATION ANALYSIS

Table 4.2 presents the correlation matrix among the variables in the leverage equation and Table 4.3 displays the correlation matrix for the debt maturity equation. These correlations express some simple relations among the variables before generating the simultaneous equations regression results. It can be seen in both tables that leverage and debt maturity are positively correlated and significant at 1% level. In addition, all variables are significantly correlated to the leverage at 1% level except for the asset maturity and term structure. Only ROA is found to have a significant negative relationship with leverage.

Debt maturity is positively and statistically significant to the growth opportunities, size, regulated firm, ROA, tangibility and asset maturity at 1% level. However, the NOL carrryforwards is negative and significant to debt maturity at 1% level and term structure is also negatively significant to the debt maturity at 5% level.

Growth opportunities are positively significant to regulated firm, abnormal earnings, ROA and term structure at 1% level. Tangibility and asset maturity are negatively significant to growth opportunities at 1% level. Meanwhile, size shows different correlation results from different equation. Size is negatively significant to growth opportunities at 5% level in debt maturity equation but it is not significant in the leverage equation.

It is also shown that NOL carryforwards is negatively significant to the size at 1% level in both leverage and debt maturity equations. As for other variables like

regulated firm, ROA, tangibility and asset maturity, they are positively significant to the size at 1% level.

The relationship between NOL carryforwards and regulated firms is negative in both equations but only significant in the debt maturity equation. Under the debt maturity equation, there is a positively significant relationship between NOL carryforwards and asset maturity while abnormal earnings have a positively significant correlation with asset maturity at 1% level. Under the leverage equation, the ROA is negative and statistically significant with tangibility at 1% level. The variables that are not significant imply that there are no correlations between those variables.

Table 4.2: Correlation Matrix for Leverage

	LEV	DM	GROW	SIZE	NOL	REGUL	ABNR	ROA	TANG
LEV	1.0000								

DM	0.0392***	1.0000							
	(2.9920)	-----							
GROW	0.3562***	0.0452***	1.0000						
	(29.0404)	(3.4485)	-----						
SIZE	0.0261**	0.3614***	-0.0154	1.0000					
	(1.9887)	(29.5287)	(-1.17)	-----					
NOL	0.1814***	-0.0673***	-0.0047	-0.1652***	1.0000				
	(14.0491)	(-5.1364)	(-0.3568)	(-12.7585)	-----				
REGUL	0.0388***	0.203618***	0.0393***	0.2900***	-0.0421	1.0000			
	(2.9570)	(15.8444)	(2.9993)	(23.0870)	(-3.2101)	-----			
ABNR	0.1165***	-0.0029	0.0787***	-0.0096	0.0127	0.0034	1.0000		
	(8.9371)	(-0.2175)	(6.0153)	(-0.7295)	(0.9705)	(0.2613)	-----		
ROA	-0.2021***	0.0609***	0.1329***	0.0813***	-0.2064***	0.0252*	-0.0083	1.0000	
	(-15.7248)	(4.6457)	(10.2131)	(6.2147)	(-16.0712)	(1.9198)	(-0.6301)	-----	
TANG	0.0607***	0.1812***	-0.0743***	0.0693***	0.0040	0.0325**	0.0060	-0.0565***	1.0000
	(4.6301)	(14.0353)	(-5.6761)	(5.2890)	(0.3052)	(2.4806)	(0.4580)	(-4.3094)	-----

Note: Notes: The number of observations is 5275 consisting of the sample of listed companies during the 1999-2010 period. LEV is generated by dividing total debt to total asset. DM is long-term debt divided by total debt. GROW is total asset plus market capitalization then minus common equity, divided by total asset. REGUL used dummy variable, 1 for utilities companies and other are 0. SIZE is measured by log of total assets. NOL carryforwards dummy equals 1 for net operating loss and 0 otherwise. ABNR is the difference between earnings in year *t+1* and *t*, then divided by earnings in year *t*. PROFIT is the ratio of EBITDA to total assets. TANG is tangible asset divided by total assets.

Table 4.3: Correlation Matrix for Debt Maturity

	DM	LEV	GROW	SIZE	NOL	REGUL	ABNR	ASMAT	SPEARD
DM	1.0000								

LEV	0.0404***	1.0000							
	(3.1405)	-----							
GROW	0.0392***	0.3410***	1.0000						
	(3.0437)	(28.1456)	-----						
SIZE	0.3652***	0.0323**	-0.0280**	1.0000					
	(30.4390)	(2.5043)	(-2.1732)	-----					
NOL	-0.0524***	0.1804***	-0.0122	-0.1401***	1.0000				
	(-4.0683)	(14.2349)	(-0.9484)	(-10.9827)	-----				
REGUL	0.2051***	0.0411***	0.0348***	0.2931***	-0.0396**	1.0000			
	(16.2583)	(3.1921)	(2.7045)	(23.7877)	(-3.0777)	-----			
ABNR	0.0089	0.1093***	0.0672***	-0.0015	0.0065	0.0017	1.0000		
	(0.6889)	(8.5297)	(5.2230)	(-0.1213)	(0.5063)	(0.1326)	-----		
ASMAT	0.1275***	-0.0119	-0.0693***	0.0880***	0.0429***	-0.0281**	0.2532***	1.0000	
	(9.9765)	(-0.9253)	(-5.3889)	(6.8545)	(3.3353)	(-2.1812)	(20.3117)	-----	
SPREAD	-0.0328**	-0.0004	0.0670***	0.0006	-0.0130	0.0050	-0.0152	-0.0198	1.0000
	(-2.5477)	(-0.0305)	(5.2147)	(0.0446)	(-1.0097)	(0.3845)	(-1.1759)	(-1.5354)	-----

Notes: The number of observations is 5275 consisting of the sample of listed companies during the 1999-2010 period. LEV is generated by dividing total debt to total asset. DM is long-term debt divided by total debt. GROW is total asset plus market capitalization then minus common equity, divided by total asset. REGUL used dummy variable, 1 for utilities companies and other are 0. SIZE is measured by log of total assets. NOL carryforwards dummy equals 1 for net operating loss and 0 otherwise. ABNR is the difference between earnings in year *t+1* and *t*, then divided by earnings in year *t*. ASMAT is the ratio of fixed assets to annual depreciation expenses. SPREAD is measured by the difference between the month-end yields on long term of 10-yearsgovernment bonds(MGS) and three-month Treasury-bills and matched with the firm's fiscal year-end.

4.4 RESULT OF MULTICOLLINEARITY TEST

Variance Inflation Factor (VIF) is used to detect the existence of the symptoms of multicollinearity between independent variables. The VIF test results obtained for each variable in each regression model are as follows:

Table 4.4: *Multicollinearity Test of Leverage Equation*

Leverage Equation			
Variable	Coefficient Variance	VIF	Inference
DM	0.0001	1.2046	There is no multicollinearity
GROW	0.0000	1.0360	There is no multicollinearity
SIZE	0.0000	1.2507	There is no multicollinearity
NOL	0.0001	1.0698	There is no multicollinearity
REGUL	0.0004	1.1073	There is no multicollinearity
ABNR	0.0000	1.0069	There is no multicollinearity
ROA	0.0000	1.0711	There is no multicollinearity
TANG	0.0003	1.0451	There is no multicollinearity

Table 4.5: *Multicollinearity Test of Debt Maturity Equation*

Debt Maturity Equation			
Variable	Coefficient Variance	VIF	Inference
LEV	0.0002	1.1955	There is no multicollinearity
GROW	0.0000	1.1559	There is no multicollinearity
SIZE	0.0000	1.1346	There is no multicollinearity
NOL	0.0001	1.0690	There is no multicollinearity
REGUL	0.0005	1.0999	There is no multicollinearity
ABNR	0.0000	1.0879	There is no multicollinearity
ASMAT	0.0000	1.0934	There is no multicollinearity
SPREAD	0.0000	1.0056	There is no multicollinearity

The table above shows that there are no independent variables that have VIF values greater than 10. Therefore, it is concluded that there is no multicollinearity between independent variables in both regression models.

4. 5 REGRESSION ANALYSIS

4.5.1 ANALYSIS FOR SINGLE EQUATION WITHOUT ENDOGENEITY VARIABLES

Table 4.6 below shows the results of single equation regression model without endogeneity variables in which debt maturity and leverage ratio are not included as regressors. The table reports the regression results for all non-financial firms listed on Bursa Malaysia with the total number of observation is approximately 5607 and 5209 for leverage and debt maturity equations. Estimation using EGLS will potentially reduce the number of observation since it is able to determine and adjust the data to be used. EGLS is also able to overcome the problem on heteroscedasticity and autocorrelation as evident from the Durbin-Watson analysis equals to 1.91 for leverage and 2.12 for debt maturity.

In this single equation model without endogeneity, the adjusted R-squared for leverage and debt maturity models are 0.854 and 0.898 respectively. The F-test of the leverage model is shown by the significant value of 0.000 where the value is smaller than the significant level at 1%. Thus, this means H_0 is rejected and H_a is accepted. Therefore, it can be concluded that the *debt maturity, growth opportunities, firm size, NOLs, regulated firm, abnormal earnings, ROA*, and *tangibility* significantly influence *leverage*. It is also applicable to the debt maturity model where the significant value of F-test equals to 0.000, which is less than the required significant limit at 1% level. Therefore, *leverage, growth opportunities, firm size, NOLs, regulated firm, abnormal earnings, asset maturity* and *term structure* have significant effects on *debt maturity*.

Table 4.6: *Single Equation without Endogeneity Variables*

	Expected Sign		Panel EGLS with AR(1) Single Equation	
	Leverage	Maturity	Leverage	Maturity
Leverage [LEV]				
Debt Maturity [DM]				
Growth Opportunities [GROW]	+	+	0.0225***	-0.00197
			(6.4013)	(-1.32551)
Regulated Firm [REGUL]	+	+	-0.0732**	0.2170***
			(-2.0335)	(4.8009)
Firm Size [SIZE]	+	+	0.0446***	0.0920***
			(15.6398)	(11.8616)
NOL carryforwards [NOL]	-	-	0.0142***	-0.0060
			(4.2386)	(-1.5021)
Abnormal Earnings [ABNR]	+	-	-0.0001***	-0.0009***
			(-43.3969)	(-3.3162)
Profitability [ROA]	-		-0.0026***	
			(-16.5296)	
Tangibility [TANG]	+		0.0748***	
			(4.0284)	
Asset Maturity [ASMAT]		+		0.0001*
				(1.8833)
Term Structure [SPREAD]		+		0.0003
				(0.1528)
C			-0.4331	-0.8645
			(-9.1025)	(-8.9256)
AR (1)			0.8972	0.7941
			(106.0028)	(87.7733)
Number of Observation			5607	5209
R-squared			0.8544	0.8984
Adjusted R-squared			0.8542	0.8983
Prob (F-statistic)			0.0000	0.0000
Durbin-Watson stat			1.9103	2.1226

This table presents the results of a single equation regression without endogeneity variables in which leverage and debt maturity are not included as regressors estimated using EGLS with AR (1). The sample included in the leverage and debt maturity equations consists of 5607 and 5209 firm-year observations respectively from 1999-2010. The variables are defined in Table 4.1. Reported t-statistics (in parentheses) are based on heteroskedasticity consistent standard errors and are adjusted for serial correlation among observations from the same firm. ***,**,* Statistically significant at the 1%, 5%, and 10% level, respectively (two-tailed test)

Based on the regression results, it is found that growth opportunities, firm size and tangibility are positively significant to the leverage, which is consistent with the finding by Chen (2004). A positive growth opportunity is consistent with signaling theory which predicts that firms with the best earnings and growth prospects will take the most leverage. Lang, Ofek, and Stulz (1996) further argue that leverage has a negative relationship with growth opportunities only for the firms whose capital market was not recognized for their growth opportunities. The Malaysian capital market has been widely recognized an indication of growth opportunities associated with public listed firms due to high market capitalization. Thus, the banks in Malaysia will assign higher valuation and consequently, issue more long-term debt to highly leveraged firms to finance their growth opportunities.

Table 4.6 also reports a positively significant relationship between size and leverage that supports the proposed hypothesis. This is because large firms are more diversified and thus, they are less exposed to the risk of bankruptcy (Rajan & Zingales, 1995). Another study by Chang and Rhee (1990) claims that large firm have better access to capital markets.

This study reaffirms that the positive relationship between a firm's leverage particularly with long-term debt in its maturity and also tangibility of its assets which support the agency cost theory (Jensen & Meckling, 1976). The theory states that debt secured by tangible asset will reduce the agency cost in the firm. In addition, the negative relationship between profitability, measured by ROA, with the leverage in

Malaysian firms seems to support the agency cost theory, which suggest that increase in profitability will result in lower leverage (Barclay et al., 2003).

The NOL carryforward dummy is significantly positive in the leverage regression. Although the sign on the NOL carryforwards dummy is opposite to the predicted sign, it is consistent with Barclay et al. (1997). The primary reason in positive NOL carryforwards is that Malaysian firms with NOL carryforwards have higher leverage due to the losses generated from the carryforwards has caused equity to fall in value, thus causing leverage to rise.

Abnormal earnings are found to have a negative relationship with the firm's leverage; this is, however, inconsistent with previous prediction. However, this finding is in line with a study conducted by Muradoglu and Sivaprasad (2009) who find negative relationship between abnormal earnings and leverage. They also argue that abnormal earnings increase as the average industry's leverage in a risk class increases. Separating the average level of external financing in an industry from that of in a particular firm is important. Modigliani and Miller (1958) state that abnormal earnings increase with firm leverage in the utilities' risk class. They indicate that a positive relationship between leverage and abnormal earnings is only in utilities sector and thus, this may pose negative effects to other industry.

The right side of Table 4.3 reports the single equation regression for debt maturity without endogeneity variables. The results of regression show that regulated firm, firm size and asset maturity are positively significant to the debt maturity which

is consistent with Barclay et al. (2003). In addition, the variable of abnormal earnings is negative and statistically significant.

As expected, the coefficient on regulated firm is positive and significant in the maturity regression due to less discretion in investment decisions and less debt agency problems in regulated firms. Consequently, regulated firms can have longer term maturity (Barclay & Smith, 1995).

This study is consistent with several previous studies that found firm size to be positively significant with long-term debt maturity. Large firms tend to have more collateralizable assets and thus would be expected to carry more debt (Barclay et al., 2003). Further agency theory based-argument comes from Jensen (1986) which suggests that large firms issue more long-term debt because they use debt to better control management behaviors due to more dilution of ownership.

Asset maturity is positively and statistically significant to the debt maturity. It is in the same direction with Barclay et al. (2003), Sunarsih (2004) and Elyasiani et al. (2002). Furthermore, the negative and statistically significant relationship between abnormal earnings and debt maturity is in line with signaling theory which states that strong and weak firms will choose to issue short-term and long-term debts respectively (Flannery, 1986).

4.5.2 ANALYSIS FOR SINGLE EQUATION WITH ENDOGENEITY VARIABLES

Table 4.7 reports the regression result of EGLS with AR (1) for a single equation regression in which debt maturity and leverage are included as regressors. For this model, the adjusted R-squared shows 0.8455 on leverage, implies the power of the model in explaining the leverage is 84.55% and this model does not explain the remaining 15.45%. As for the debt maturity regression, the adjusted R-squared is 0.8060 which means that the model could explain the effect of its proxies approximately by 80.60%. The F-statistics probabilities for both leverage and debt maturity indicate they are significant at 1% level since the p-value is 0.000 less than 0.05.

Similar to Barclay and Smith (1995) and Stohs and Mauer (1996), leverage is found to be significantly positive in relations to debt maturity based on the arguments that firms with high leverage will choose longer term debt maturity to avoid suboptimal liquidation (Diamond, 1991 & Sharpe, 1991). Consistent with the prior literatures, the coefficient on firm size is positively significant in both regressions. The coefficient on abnormal earnings, tangibility and growth opportunities are positive and statistically significant to the leverage.

Table 4.7: *Single Equation with Endogeneity Variables*

	Expected Sign		Panel EGLS with AR(1) Single Equation	
	Leverage	Maturity	Leverage	Maturity
Leverage [LEV]		+		0.0547***
				(4.4434)
Debt Maturity [DM]	+		0.0186***	
			(2.8514)	
Growth Opportunities [GROW]	+	+	0.0383***	-0.0026
			(7.1109)	(-0.8653)
Regulated Firm [REGUL]	+	+	-0.0698**	0.1896***
			(-2.1953)	(3.7039)
Firm Size [SIZE]	+	+	0.0343***	0.0959***
			(12.3158)	(9.8592)
NOL carryfowrads [NOL]	-	-	0.0117***	-0.0068*
			(3.8963)	(-1.6595)
Abnormal Earnings [ABNR]	+	-	0.0018*	-0.0011***
			(1.6660)	(-4.5192)
Profitability [ROA]	-		-0.0028***	
			(-16.4709)	
Tangibility [TANG]	+		0.0647***	
			(4.2949)	
Asset Maturity [ASMAT]		+		0.0001**
				(2.3456)
Term Structure [SPREAD]		+		0.0006
				(0.2750)
C			-0.2794	-0.9267
			(-6.1810)	(-7.5948)
AR(1)			0.8878	0.7980
			(105.5387)	(95.5012)
Number of Observation			4988	5209
R-squared			0.8458	0.8064
Adjusted R-squared			0.8455	0.8060
Prob (F-statistic)			0.0000	0.0000
Durbin-Watson stat			1.9137	2.1337

This table presents the results of a single equation regression with endogeneity variables in which leverage and debt maturity are included as regressors estimated using EGLS with AR (1). The sample included in the leverage and debt maturity equations consists of 4988 and 5209 firm-year observations respectively from 1999-2010. The variables are defined in Table 4.1. Reported t-statistics (in parentheses are based on heteroskedasticity consistent standard errors and are adjusted for serial correlation among observations from the same firm. ***,**,* Statistically significant at the 1%, 5%, and 10% level, respectively (two-tailed test)

In the leverage regression, the NOL carryforwards dummy has a significantly positive coefficient which is opposite to the predicted sign. It is generally supported by Harris and Raviv (1991) that leverage is positively related to NOL carryforwards, which contradicts the trade-off theory. Profitability (ROA) has a significantly negative coefficient, and this is in line with Barclay et al. (2003), Elyasiani et al. (2002) and Johnson (2003).

Furthermore, regulated firm is negative and significant to the leverage which is opposite to current findings found in the literature (Sanyal & Bulan, 2010). This is due to the fact that Malaysian firms face higher transaction cost in the public debt market in order to fulfill the requirement of disclosure to reduce information asymmetry.

In the maturity regression, regulated firm, firm size and asset maturity are positively significant, consistent with the finding by Barclay et al. (2003) and Elyasiani et al. (2002). Meanwhile, the estimate of the abnormal earnings coefficient is significantly negative, which supports the signaling theory and it is in line with Barclay and Smith (1995), Flannery (1986) and Diamond (1991).

In addition, the NOL carryforwards dummy has a negatively significant relationship to debt maturity, consistent with the predicted sign. Johnson (2003) also documented the same evidence of negative relationship between NOLs and debt maturity.

4.5.3 ANALYSIS FOR SIMULTANEOUS EQUATIONS REGRESSIONS

A. TESTING OF F-STATISTICS

Based on the result of regression analysis in both model, the F-statistics probabilities in leverage and debt maturity indicate that it is significant at 1% level since the p-value is 0.000 less than the significant level at 0.05. It means H_0 is rejected and H_a are received for both leverage and debt maturity equations. Thus, the result of the regression shows that the *debt maturity, growth opportunity, firm size, NOLs, regulated firm, abnormal earnings, ROA* and *tangibility* are jointly significant to leverage. This is also in line with the debt maturity equation where eight independent variables, namely *leverage, growth opportunity, regulated firm, firm size, NOLs, abnormal earnings, asset maturity* and *term structure*, are jointly significant to debt maturity.

Furthermore, for the testing of coefficient determination, the adjusted R-squared is employed. In this model, for *debt maturity*, the equation shows adjusted R-squared at 0.9107 and it indicates that the power of this model in explaining the effect of debt maturity is 91.07%. There are still 8.93% factors affecting debt maturity that are not explained by this equation. R-squared for leverage equation shows 0.1714. This means that 17.14% of the dependent variable, which is *leverage*, can be explained or influenced by independent variables (*debt maturity, growth opportunities, regulated firm, firm size, NOLs, abnormal earning, profitability* and *tangibility*).

Table 4.8: *Two-Stage Least Squares Regression*

	Expected Sign		Panel EGLS with AR(1) 2SLS Regression	
	Leverage	Maturity	Leverage	Maturity
Leverage [LEV]		+		-0.1145**
				(-2.0073)
Debt Maturity [DM]	+		-2.1055***	
			(-6.5470)	
Growth Opportunities [GROW]	+	+	0.1374***	0.0056
			(7.5434)	(1.1171)
Regulated Firm [REGUL]	+	+	0.4985***	0.2230***
			(4.0344)	(4.3123)
Firm Size [SIZE]	+	+	0.1943***	0.0974***
			(5.7450)	(12.5541)
NOL carryforwards [NOL]	-	-	-0.0034	-0.0029
			(-0.3278)	(-0.7928)
Abnormal Earnings [ABNR]	+	-	-0.0001	-0.0013***
			(-0.1797)	(-4.4555)
Profitability [ROA]	-		-0.0011**	
			(-1.9984)	
Tangibility [TANG]	+		0.5573***	
			(5.0687)	
Asset Maturity [ASMAT]		+		0.0001**
				(2.2252)
Term Structure [SPREAD]		+		-0.0019
				(-1.0382)
C			-1.8691	-0.9107
			(-4.8427)	(-8.4226)
AR(1)			0.7734	0.7768
			(78.5413)	(111.0671)
Number of Observation			4919	5200
R-squared			0.172945	0.9109
Adjusted R-squared			0.171429	0.9107
Prob (F-statistic)			0.0000	0.0000
Durbin-Watson stat			2.049293	2.0707

This table presents the results of second stage simultaneous equations regressions on explanatory variables estimated using two-stage least squares (2SLS) model. The sample included in the leverage and debt maturity equations consists of 4919 and 5200 firm-year observations from 1999-2010. The variables are defined in Table 4.1. Reported t-statistic (in parentheses are based on heteroskedasticity consistent standard errors and are adjusted for serial correlation among observations from the same firm. ***,**,* Statistically significant at the 1%, 5%, and 10% level, respectively (two-tailed test)

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From the regression of both equation in Table 4.8, the coefficient correlation in both of dependent variables, namely leverage and debt maturity show negatively significant to each other. This shows that the relationship between leverage and debt maturity are complementary, which means there is a negative direction of the simultaneity relationship between the two variables. This is the same as noted by Barclay et al. (2003) that the coefficient on debt maturity in the leverage regression and the coefficient on leverage in the debt maturity regression should have the same sign to show that there is simultaneity between the models.

In this study, the simultaneous equations regression result between leverage and debt maturity yields a negative relationship which is not in accordance with predicted sign. This may be due to leverage and maturity are substitutes in addressing the under and over investment problems (Barclay et al., 2003).

Underinvestment problem will arise if the company is facing an opportunity to invest in positive NPV projects, which require the use of substantial funds. In the case of companies with low free cash flow and lower asset in place, they tend to take on new debt to continue with the existing project. This will result in the occurrences of conflicts between shareholders and bondholders. In terms of shareholders, profits should be distributed as dividend, while profit for the bondholders should be used to pay off the debt. In some cases, the bondholder earns sufficient profits, while the shareholders do not get normal benefit from the positive NPV projects undertaken. This indicates that the use of debt in companies that have a high investment opportunity is costly. So firms in this state will choose to leave the project with positive NPV and lose the opportunity to grow.

If the firm still wants to continue the projects with positive NPV, the firm with a high investment opportunity should use the leverage in small amounts, or use internal funds owned by enterprises as alternative funding. Furthermore, Myers (1977) says that another approach to control the underinvestment problem is by using small amounts of leverage, and also done by shortening the maturity of debt. In line with this, Myers (1977), Bodie and Taggart (1978) state that by shortening the maturity of debt, it can solve problems related to the investment opportunity in the future.

However, the above situation contradicts from trade off theory perspective which states that a short maturity policy that reduces the agency cost associated with underinvestment incentives allows the firm to use more leverage, then a potential indirect negative relationship between maturity and leverage. For firms that can control underinvestment incentives sufficiently by reducing leverage, they will have less incentive to use short term debt maturity. It is due to that the negative effect of growth opportunities upon debt maturity will be attenuated by the initial choice of low leverage. Finally, lowering of the agency cost of the reduced debt overhang may allow firms to use long term debt maturity thus, a potential indirect negative correlation between leverage and maturity. In short, the effect of growth opportunities upon leverage (maturity) may be conditional upon the initial choice of debt maturity (leverage) (Dang, 2010).

Since debt maturity and leverage can relate negatively when they are used as strategic substitutes in controlling agency problems, the sign of the relationship

between leverage and debt maturity is determined by the net effect of the reduced underinvestment problem and increased liquidity risk. Theoretically, for firms that can shorten the debt maturity to control the underinvestment problem sufficiently, the negative impacts of growth on leverage may be fully eliminated (Johnson, 2003).

Meanwhile, for firms with a small investment opportunity, i.e. firms that are in mature stage, slow growth and higher asset in place with higher free cash flow, it is possible to face overinvestment problem. Jensen (1986) argues that the cause of overinvestment problem in the firm with slow growth is the excess in free cash flow. This is due to the excess of free cash flows which is less profitable when reinvested in the firms. As a result, managers tend to invest excess of capital (free cash flow) on other projects. In this circumstance, there is a conflict between shareholders and managers. Managers assume that they have an interest to use free cash flow in investment related to the opportunity to grow above the optimal size and compensation to be received as a reward from this growth, while shareholders believe that free cash flow should be distributed as dividends. Shareholders claim for dividends arise due to the tendency of managers investing in projects that will harm the investors. Thus, managers assume that the demands of investors in the form of additional dividend distribution will impede the achievement of managers' objectives.

Firms with overinvestment problems generally have higher assets in place. These assets can be used as collateral on debt decision policy, thus enabling the firm to take higher level of debt. Usually firms with overinvestment problems have a high level of debt. To control the overinvestment problem faced by firms, they should take on large debt with long maturity debt.

However, it must be remembered that leverage and debt maturity are strategic substitutes in controlling the underinvestment incentives. To control underinvestment, firms will always lower leverage but may not shorten debt maturity due to the liquidity constraint. In an extreme case when liquidation probabilities are too high, firms may have to lengthen its debt maturity. Nevertheless, this strategy may lead to a more severe underinvestment problem. Therefore, this study found a negative relationship between leverage and debt maturity. Thus it can be stated that in Malaysian firms, leverage and debt maturity are substitute variables in addressing the over and underinvestment problems.

Other explanations regarding discrepancy between the predicted sign and the result may also be due to the definition of long term debt adopted in this study in which it has no clear standard. According to Barclay et al. (2003), they state that measurements for debt maturity equal to the fraction of the firm's total debt measured for more than 3 years. Whereas in this study, long term debt is a variable collected from *Datastream* with the terms of debt that have maturity of more than one year; this proportion is similar to short term debt by Johnson (2003), in which the proportion of debt matures within three years. Thus, it can be possible, that the long-term debt in this study comes under the category of short-term debt as used by Johnson (2003).

In Malaysia, most companies are using short-term debt maturity than long-term debt and only a few companies issue Sukuk (Mustapha, Ismail, & Minai, 2011). This also confirms the finding by Demirguc-Kunt and Maksimovic (1999) that the most fundamental difference between developed and developing countries is that

developing countries would prefer to use short term debt rather than using long term debt. So, note that there is possibility that the long term debt in this study is actually included in the category of short term debt as it stated by Johnson (2003).

On the basis of the above explanation, it is possible that the negative results obtained from this study are based on the factors that have been described. It is likely that this study supports the finding in Johnson (2003). Thus, the negative coefficient between debt maturity and leverage is consistent with Johnson (2003) in which higher leverage firms use lower short term debt to mitigate investment opportunity problems.

B. TESTING OF T-STATISTICS

This section discusses the result of simultaneous equation using two-stages least squares (2SLS) regressions in which leverage and debt maturity are endogenous. From Table 4.8, it can be compiled that the simultaneous equation regression is as follows:

$$LEV = -2.1055\ DM + 0.1374\ GROW + 0.4985\ REGUL + 0.1943\ SIZE - 0.0034\ NOL - 0.001\ ABNR - 0.0011\ ROA + 0.5573\ TANG$$

$$DM = -0.1145\ LEV + 0.0056\ GROW + 0.2230\ REGUL + 0.0974\ SIZE - 0.0029\ NOL - 0.0013\ ABNR + 0.0001\ ASMAT - 0.0019\ SPREAD$$

From the regression equation in the above report, the results show the t-test estimation for leverage and debt maturity equation by using 2SLS regressions. It can

be seen that the coefficient of debt maturity and leverage are negatively significant. This is similar to previous discussions which states that there is simultaneity between leverage and debt maturity in the negative direction. This indicates that leverage and debt maturity are strategic substitutes in controlling underinvestment incentives. It means that when firms have less financial flexibility, the cost of liquidation outweighs the cost of the underinvestment problem. Thus, to control the underinvestment incentives, firm will always lower its leverage without shortening debt maturity due to the liquidation constraint. So, negative correlation exists between leverage and debt maturity to mitigate under investment problems.

Based on the result of regression, growth opportunity is statistically significant with positive coefficient to the leverage which supports the signaling theory. Firms with higher growth opportunities usually face high investment opportunities with low asset in place and still in the early stage. Thus, firms with high growth opportunities need to finance their business activities using huge amount of leverage. This indicates that growth opportunities have a positive relationship to leverage.

Bringham and Houston (2001) state that if other things remain the same (ceteris paribus), a growing firm will rely more on external financing. Since the cost of issue common stock is more expensive that the issuing of bonds, the firms that resort to the use of external financing are more reliant on debt than equity and this is in accordance with the pecking order theory. Therefore, growth of the firm will be positive in relation with debt level in capital structure decisions, empirically it is similar for Malaysian listed companies. Based on the result of this study, growth

opportunity variable has a significantly positive effect on the determination of debt in capital structure.

Regulated firms show positive coefficient and statistically significant both in leverage and debt maturity which supported the finding by Barclay et al. (2003) and Johnson (2003). The positive relationship that exists between regulated firm and leverages is because regulated firms always maintain optimal leverage to reduce the agency risk (Bradley et al., 1984). While for maturity regression, positive coefficient at 1% level of significant which is in accordance to Barclay and Smith (1995) who state that regulated firm can borrow longer term debt due to less discretion in investment decision, and also less agency problems.

Furthermore, firm size is also positively significant in both regressions in accordance with the findings by Bevan and Danbolt (2002) and Barclay et al. (2003). All empirical studies suggest positive relation between firm sizes to leverage due to the fact that larger firms have smaller probability of facing bankruptcy thus allowing them to take higher leverage which also means having easy access to the bond market (Titman and Wessels, 1998) and (Rajan and Zingales, 1995). Meanwhile, the relationship between debt maturity and firm size is positively significant. Positive effect of firm size, in accordance with the proposed hypothesis, and the results support the study conducted by Titman and Wessels (1998), Bevan and Danbolt (2000) and Barclay and Smith (1995).

Signaling effect as measured by future abnormal earnings found negative coefficient to debt maturity and leverage. However, only debt maturity is statistically

significant to abnormal earnings. Negative effect and not significantly effect on leverage is inconsistent with the hypothesis in which value of future abnormal earnings coefficient report that leverage cannot be taken as an indication of the profitability of Malaysian firms. The level of profitability in Malaysia is usually indicated by the level of dividend payments and stock prices. Thus the results of this study do not support the signaling theory. Meanwhile, the debt maturity is found to have negative coefficient and significant to abnormal earning. The results are consistent with studies by Barclay and Smith (1995) and Sunarsih (2004) who prove that more valuable firms will use more short-term debt, thus the negative correlation between long-term debt maturity to abnormal earnings, and this study supports the signaling theory.

The results of profitability as measured by ROA shows negative coefficient to leverage and significant at 5% level. This is in line with Titman and Wessels (1988) and Fama and French (2002) who found a negative relationship between profitability and leverage since more profitable firms with higher ROA tend to have less leverage which supports the pecking order theory. This is in line with Myers (1984) who states that higher profitable firms will have greater retained earnings and would like to use their retained earnings first to finance its projects or new investments.

The positive and significant coefficient of tangibility implies that accepting the hypothesis that has been proposed due to the use of leverage in corporate capital structure significantly affected by the asset structure (asset tangibility). This indicates that greater tangibility will increase the use of leverage in corporate capital structure. Tangibility as indicator of asset structure shows the proportion of how much value of

fixed assets that can be used as collateral to the lender. Thus, the higher the tangibility, the smaller the risk for the lender. It means that firms with higher asset tangibility will be able to provide collateral to obtain financing from lenders. The result of this analysis is in accordance with pecking order theory with asymmetric information. According to previous study, this is in line with the result conducted by Delcoure (2006) and Barclay et al. (2003).

The coefficient result for asset maturity shows positive coefficient to the debt maturity and statistically significant at 5% level which support the proposed hypothesis. This study supports the previous research done by Barclay et al. (2003), Ozkan (2002) and Stohs and Mauer (1996) who argue that when debt maturity is shorter than asset maturity; it could mean that firms do not have sufficient fund to meet their obligations when they are due. In other words, when the maturity of debt is larger than its maturity of asset, the firm still has to fulfill its obligations while the time period of cash flow from asset runs out. Then, for other variables like NOL and term structure, they are not significant in this two stage least squares regression.

4.6 SUMMARY OF ALL REGRESSION ANALYSIS

This study investigates empirically the relationship between leverage and debt maturity by using a simultaneous equations model on debt maturity and leverage for all sample panel data. This study also estimates a single equation without endogeneity and with endogeneity for both leverage and debt maturity using pooled EGLS with AR(1) to compare with previous studies. Leverage is defined as using total debt to

total asset, while debt maturity is defined as using long term debt divided by total debt.

The results of all regression analysis in Table 4.9 report that growth opportunity is significantly positive in all regression both in single and simultaneous equation. It means that Malaysian firms which have high growth opportunity will take much more leverage in the determination of capital structure. However, the growth opportunity does not affect the determination of debt maturity. Thus, Malaysian firms cannot rely on growth opportunity in determining debt maturity. In sum, there is a relationship between leverage and growth opportunity as predicted, while on the other hand, growth opportunity does not significantly affect debt maturity and thus, the proposed hypothesis is rejected.

Regulated firm and firm size are positively coefficient and statistically significant in both hypothesis of leverage and debt maturity either in single and simultaneous regression. This is in line with a study conducted by Barclay et al. (2003) and Johnson (2003). While, for net operation loss carryforwards variable is positively significant to leverage but only significant in single equations. The positively significant relationship between net operating loss carryforwards and leverage contradicts with the predicted sign which is in line with studies by Barclay, Marx and Smith (1997) and Harris and Raviv (1991). It indicates that firms in Malaysia with higher net operating loss carryforwards will have higher leverage due to the losses generated by the net operating loss carryforwards which cause equity to fall in value.

Abnormal earnings have significant affect and the hypothesis is accepted but it contradicts with the predicted sign. In this study, negative relationship between abnormal earnings and leverage is supported by Muradoglu and Sivaprasad (2009). Thus, for Malaysian firms with higher abnormal earnings, they will use lower leverage, however the study by Modigliani and Miller (1958) find positively significant relationship only for utilities sectors. Therefore, it is possible for industry in Malaysia to have negative relationship between abnormal earnings and leverage. On the other hand, debt maturity equation accepted the proposed hypothesis, which is in line with study conducted by Barclay and Smith (1995) and Sunarsih (2004) that argue abnormal earnings give good signal to the market which means that the firm is of good quality; more valuable firm will use more short term debt than long term debt.

As expected, profitability and tangibility are consistent and thus support the proposed hypothesis in leverage equation either in single or simultaneity regression. This is also in line with asset maturity which is consistent to proposed hypothesis and positively significant to debt maturity equation. Thus, Malaysian firms can take these three variables namely, profitability, tangibility and asset maturity into considerations in determining the level of debt in capital structure.

In addition, the result of term structure rejects the hypothesis in all regression, either in a single and simultaneous regression. Therefore, term structure cannot be used by Malaysian firms as a reference in determining the level of debt especially in debt maturity.

Lastly, for the simultaneity test, this study found that negative and statistically significant between leverage and debt maturity. It indicates that, there is simultaneity between leverage and debt maturity in the negative direction. Negative direction between leverage and debt maturity reflects that both variables are substitutes in addressing the under and over investment problems in Malaysia. Thus, the result of this study have answered the proposed objective, that this leverage and debt maturity is complementary each other in negative direction.

Table 4.9: *Summary of Findings*

	Expected Sign		Panel EGLS with AR(1) Single Equation		Panel EGLS with AR(1) Single Equation		Panel EGLS with AR(1) 2SLS Regression	
	Leverage	Maturity	Leverage	Maturity	Leverage	Maturity	Leverage	Maturity
Leverage [LEV]		+				0.0547***		-0.1145**
						(4.4434)		(-2.0073)
Debt Maturity [DM]	+				0.0186***		-2.1055***	
					(2.8514)		(-6.5470)	
Growth Opportunities [GROW]	+	+	0.0225***	-0.00197	0.0383***	-0.0026	0.1374***	0.0056
			(6.4013)	(-1.32551)	(7.1109)	(-0.8653)	(7.5434)	(1.1171)
Regulated Firm [REGUL]	+	+	-0.0732**	0.2170***	-0.0698**	0.1896***	0.4985***	0.2230***
			(-2.0335)	(4.8009)	(-2.1953)	(3.7039)	(4.0344)	(4.3123)
Firm Size [SIZE]	+	+	0.0446***	0.0920***	0.0343***	0.0959***	0.1943***	0.0974***
			(15.6398)	(11.8616)	(12.3158)	(9.8592)	(5.7450)	(12.5541)
NOL carryforwards [NOL]	-	-	0.0142***	-0.0060	0.0117***	-0.0068*	-0.0034	-0.0029
			(4.2386)	(-1.5021)	(3.8963)	(-1.6595)	(-0.3278)	(-0.7928)
Abnormal earnings [ABNR]	+	-	-0.0001***	-0.0009***	0.0018*	-0.0011***	-0.0001	-0.0013***
			(-43.3969)	(-3.3162)	(1.6660)	(-4.5192)	(-0.1797)	(-4.4555)
Profitability [ROA]	-		-0.0026***		-0.0028***		-0.0011**	
			(-16.5296)		(-16.4709)		(-1.9984)	
Tangibility [TANG]	+		0.0748***		0.0647***		0.5573***	
			(4.0284)		(4.2949)		(5.0687)	
Asset Maturity [ASMAT]		+		0.0001*		0.0001**		0.0001**
				(1.8833)		(2.3456)		(2.2252)
Term Structure [SPREAD]		+		0.0003		0.0006		-0.0019
				(0.1528)		(0.2750)		(-1.0382)
C			-0.4331	-0.8645	-0.2794	-0.9267	-1.8691	-0.9107
			(-9.1025)	(-8.9256)	(-6.1810)	(-7.5948)	(-4.8427)	(-8.4226)
AR(1)			0.8972	0.7941	0.8878	0.7980	0.7734	0.7768
			(106.0028)	(87.7733)	(105.5387)	(95.5012)	(78.5413)	(111.0671)
Number of Observation			5607	5209	4988	5209	4919	5200
R-squared			0.8544	0.8984	0.8458	0.8064	0.172945	0.9109
Adjusted R-squared			0.8542	0.8983	0.8455	0.8060	0.171429	0.9107
Prob (F-statistic)			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin-Watson stat			1.9103	2.1226	1.9137	2.1337	2.049293	2.0707

Table 4.10 below summarizes the proposed hypotheses followed by the respective regression results.

Table 4.10*: Hypothesis Testing Summary*

HYPOTHESIS	SINGLE EQUATION WITHOUT ENDOGENEITY	SINGLE EQUATION WITH ENDOGENEITY	SIMULTANEOUS EQUATION 2SLS REGRESSION
LEVERAGE EQUATION			
H1a: There is a significant effect of debt maturity towards the leverage		Accepted	Accepted
H2: There is a significant effect of growth towards the leverage	Accepted	Accepted	Accepted
H3: There is a significant effect of size towards the leverage	Accepted	Accepted	Accepted
H4: There is a significant effect of NOL towards the leverage	Accepted	Accepted	Rejected
H5: There is a significant effect of regulated firm towards the leverage	Accepted	Accepted	Accepted
H6: There is a significant effect of abnormal earnings towards the leverage	Accepted	Accepted	Rejected
H7: There is a significant effect of profitability towards the leverage	Accepted	Accepted	Accepted
H8: There is a significant effect of tangibility towards the leverage	Accepted	Accepted	Accepted
DEBT MATURITY			
H1b: There is a significant effect of leverage towards the maturity		Accepted	Accepted
H9: There is a significant effect of growth towards the maturity	Rejected	Rejected	Rejected
H10: There is a significant effect of size towards the maturity	Accepted	Accepted	Accepted
H11: There is a significant effect of NOL towards the maturity	Rejected	Accepted	Rejected
H12: There is a significant effect of regulated firm towards the maturity	Accepted	Accepted	Accepted
H13: There is a significant effect of abnormal earnings towards the maturity	Accepted	Accepted	Accepted
H14: There is a significant effect of asset maturity towards the maturity	Accepted	Accepted	Accepted
H15: There is a significant effect of term structure towards the maturity	Rejected	Rejected	Rejected

4.7 CONCLUSION

This study tests the simultaneity of leverage and debt maturity as well as factors that influence the analysis of 2SLS regression, with five exogenous variables that affect the simultaneity of leverage and debt maturity, and four additional variables as a condition identification of simultaneous equations of 2SLS. This chapter covers the result of the study which consists of descriptive statistic, correlation matrix, multicollinearity test and regression analysis. The regression analysis includes three types of testing which are single equation without endogeneity variables, single equation with endogeneity variables and simultaneous equation using 2SLS regression.

CHAPTER FIVE

CONCLUSION

5.1 INTRODUCTION

This chapter concludes this study by summarizing the findings and the implications based on the objectives and limitations of the study. Section 5.2 presents the overview of the research process, followed by summary of findings in section 5.3. Then, Section 5.4 and Section 5.5 discuss the limitations and implications of research respectively. Finally, the paper ends with several recommendations for future studies in Section 5.6.

5.2 OVERVIEW OF THE RESEARCH PROCESS

This paper has examined the effect of debt maturity and leverage on Malaysian listed companies using panel data. Decisions concerning leverage and debt maturity are important issues concerning a firm's capital structure.

The sample data of this study are taken from 778 listed companies on Bursa Malaysia from 1999-2010. Financial companies are, however, not included in the study. This study also investigates how the theories relate to each other between both equations. The theories that are related with this study are agency cost theory, signaling theory, tax theory, matching theory, trade off theory, and pecking order theory. The data which is secondary are collected from the *Datastream* based on firm's balance sheet and financial report of companies. For industrial classification and regulated firms are referred from Bursa Malaysia,

while term structure come from MGS and t-bills provided in Bank Negara Malaysia website.

Furthermore, this study uses a method of pooled Estimated Generalized Least Squared (EGLS) and Autoregressive or commonly known as AR (1) with three set of regression results that consist of single equation without endogeneity variables, single equation with endogeneity variables and simultaneous equation using 2SLS regression.

5.3 SUMMARY OF FINDINGS

This study investigates empirically the relationship of simultaneity between leverage and debt maturity and factors that influence it, using a simultaneous equations framework in which leverage and debt maturity are endogenous.

Based on the analysis of the results and discussion that have been described in the previous chapter, it can be concluded that results of this study indicate the presence of simultaneity between leverage and debt maturity with negative coefficient and significantly proven. This is shown by the negative sign on the variable leverage and debt maturity in both leverage and debt maturity equation. This shows that the relationship between leverage and debt maturity are complementary, which means there is a negative direction of the simultaneity relationship between the two equations. Thus, the coefficient estimated in an OLS regression of single equations will suffer from simultaneous equation bias.

Based on the three models, they show that *growth opportunity, regulated firm, firm size, profitability* and *tangibility* are significantly correlated to leverage equations and consistent with the proposed hypothesis except the regulated firm that is not in accordance with the hypothesis. Positive growth opportunity to leverage is in line with proposed hypothesis which supports signaling theory and related to the finding of Bringham and Houston (2001). Meanwhile, *NOL* and *abnormal earnings* are significantly related to the leverage in single equation but not in simultaneous equation and only *NOL* is in accordance with the proposed hypothesis.

Furthermore, *regulated firm, firm size, abnormal earnings* and *asset maturity* are significantly related to the debt maturity in the three models which support the finding by Johnson (2003), while *NOL* is only significant and support the hypothesis for single equation with endogeneity variables. Through this study, it is found that the terms structure does not affect directly with debt maturity, either in single or simultaneous equation.

5.4 LIMITATIONS OF RESEARCH

This study has its limitations since it only focuses on leverage and debt maturity, excluding others variables such as dividend policy, covenants and so on, in which the relationship negation of other variables may bias the estimated coefficients. Like research done by Billett et al. (2007) who finds that covenant protection significantly attenuates the negative effect of growth opportunities on leverage,

suggesting that covenants can mitigate the agency cost of debt for high growth firms.

While, Barclay et al. (1995) who argues that leverage can differ in several important respects, including maturity, covenant restrictions, and call provisions, security, and whether the leverage is privately placed or publicly held. Each of these features is potentially important in determining the extent to which debt financing can cause an underinvestment problem. Therefore, future studies could add some variables to get more accurate and better results.

Next, the second limitation of this study is not dividing the period before and after the financial crisis. This can be included in future studies. The objective is to find out the relationship between leverage and debt maturity on the analysis of simultaneity of leverage and debt maturity before and after crisis- whether there is any difference or not.

5.5 IMPLICATIONS OF RESEARCH

In general, the findings from this study have helped to provide more information and empirical evidence by adding to the existing literature on the simultaneous relationship between leverage and debt maturity. The result of the research findings could have some policy implications to further understand the relationship of simultaneity between leverage and debt maturity.

This research considers two dependent variables, i.e. leverage and debt maturity in finding the simultaneity between leverage and debt maturity of the companies listed on Bursa Malaysia. Based on the results of this study, it is found that leverage and debt maturity are negatively significant. This indicates that the relationship between leverage and debt maturity are complementary to each other, which means that corporate managers should consider the leverage and debt maturity together in determining the firm's capital structure. Negative direction between leverage and debt maturity is reflected in that both variables are substitutes in addressing the under and over investment problems in Malaysia. Thus, manager can control under investment incentives through lower leverage but may not shorten debt maturity due to the liquidity constraint.

The present study also finds that the regulated firm and firm size are important factors in making decision on the leverage and debt maturity equations, in which regulated firms in Malaysia always practice optimal leverage to reduce the agency risk. In general, large firms in Malaysia have easy access to the bond market, thus resulting in higher leverage compared to small firms. The others variables like net operating loss carryforwards and term structure are not relevant in influencing the leverage and debt maturity, implying that Malaysian corporations do not rely on net operating loss carryforwards and the term structure as factors that influence decisions in capital structure. This is due to different legal, institutional, and cultural factors operating in the Malaysia.

Corporate managers can consider the fundamental factors that have a priority order, which are debt maturity, growth opportunity, regulated firm, firm size, profitability, and tangibility, since the six of fundamental factors are the factors which have the most significant effect on capital structure (measured by leverage), while leverage, regulated firm, firm size, abnormal earnings, and asset maturity are important factors in determining debt maturity.

Furthermore, there is no single exact formula to determine the optimal capital structure for all industries. However, previous empirical studies have already established certain factors that significantly affect capital structure decisions like firm size, regulated firm, abnormal earnings, growth opportunities, tangibility, and profitability and so on which motivate firms in selection of the optimal capital structure and debt maturity.

In addition, this study can be used as a reference for companies in various industries in Malaysia that need to pay attention to the level of growth opportunity, tangibility and asset maturity. Their decision will increase the attractiveness of external parties (investors and creditors). If creditors are interested to invest their funds in the firms, it is possible leverage will also increase by extending the maturity debt.

The practical implication of this study for the government and regulators in Malaysia is the provision of knowledge needed to avoid the practice of moral hazard on the policy of leverage, resulting in potential conflicts between managers

and bondholders (creditors). This contribution of this study can be used also by banks or financial institutions in the flushing and disbursement of investment credit. Problem of moral hazard is an indication of the lack of functioning control in the context of corporate governance. Fulfillment of the principles of transparency, accountability, responsibility, independency and fairness of governance of the company should direct the flushing of funds at the level of risk calculated, and do not exceed the maximum credit rating of borrower. This becomes an important task for the banking regulator to no longer be secretive about the disbursement of funds. Thus it is possible to search the sources of funding and adequacy of collateral of debt for each company in relation to the status of creditors and debtors.

Similarly, for the capital market regulator like the Security Exchange of Malaysia, for the realization of an efficient capital market that based on information, it would require serious attention from all parties involved in the Malaysian capital market to motivate people to invest in it, increase awareness on the importance of information among domestic investors through a process of socialization and education, and stricter enforcement to issuer in terms of providing information in an accurate, transparent, equitable and timely. Law enforcement has consistently been required by all capital market participants to eliminate the unlawful practices in order to achieve efficient and credible market in the eyes of the global community.

This study indicates that there may be a need to encourage policy makers in the Malaysia to create appropriate regulations that can supervise and monitor in the disbursement of funds in the form of debt to firms that operating in Malaysia, thus it can support the development of Malaysian firms since all these variables as indicators in capital market movement.

Lastly, this study hopes to improve the understanding of corporate governance mechanism and also influences the managers on capital structure decisions. In addition, this research could be expected to assist in investment decision making process and can influence the investor's actions. Finally, policy makers can use this study as a consideration in formulating regulations that can improve the existing rules so as to advance the industrial development in Malaysia.

5.6 FUTURE STUDIES

Future study could be expanded by comparing this simultaneous regression using methods of fixed and random effects. This study does not make comparison among the models using pooled, fixed effects and random effects. Thus, to enhance the result of comparison in simultaneity between leverage and debt maturity, fixed effects and random effects can be employed for further studies in this field.

In addition, this study does not include some exogenous variables used in the past studies, which are considered to have significant effects on the two

policies. There are several variables that affect the leverage and debt maturity variables. As a recommendation for further research, adding some variables such as non-debt tax shield, dividend yield and covenants, could potentially increase the accuracy in analyzing the relationship of simultaneity between leverage and debt maturity.

REFERENCES

Ahmed , H. J., & Hisham, N. (2009). Revisiting capital structure theory: A test of pecking order theory and statistic order trade-of model from Malaysian capital market. *International Research Journal of Finance and Economics,* 30, 58-65.

Ajija, S.R., Sari, D.W., Setianto, R.H., & Primanti, M.R. (2011). *Cara cerdas menguasai Eviews*. Jakarta: Salemba Empat.

Antoniou, A., Guney, Y., & Paudyal, K. (2006). The determinants of debt maturity structure: evidence from France, Germany and the UK. *European Financial Management,* 12, 161–194.

Arslan, O., & Karan, M.B. (2006). Ownership and Control Structure as Determinants of Corporate Debt Maturity: a panel study of an emerging market. *Journal of Corporate Governance,* 14, 312- 324.

Bank Negara Malaysia, *Quarterly Bulletins & Annual Report*, Kuala Lumpur, various issues.

Barclay, M. J., Marx, L. M., & Smith, C.W. (1997). Leverage and maturity as strategic complements, *working paper*, University of Rochester.

Barclay, M.J., Marx, L.M., & Smith, C.W. (2003). The joint determination of leverage and maturity. *Journal of Corporate Finance,* 9, 149-147.

Barclay, M.J., & Smith, C.W. (1995). The maturity structure of corporate debt. *Journal of Finance,* 50, 609-631.

Barclay, M.J., Smith, C.W., & Watts, R.L. (1995). The determinants of corporate leverage and dividend policies. *Journal of Applied Corporate Finance,* 7, 4-19.

Barnea, A., Hougen, R.A., & Senbet, L.M. (1980). A rationale for debt maturity structure and call provisions in the agency theoretic framework. *The Journal of Finance,* 35 (5), 1223-1234.

Bevan, A.A., & Danbolt, J. (2000). Capital structure and its determinants in the United Kingdom: a decompositional analysis. *Working Paper University of Glasgow*.

Billet, M.T., King. T-H., & Mauer, D.C. (2007). Growth opportunities and the choice of leverage, debt maturity, and Covenants. *Journal of Finance,* 62 (2), 627-729.

Bradley, M., Jarrell, G.A., & Kim, E.H. (1984). On the existence of an optimal capital structure: Theory and evidence. *Journal of Finance*, 39, 8570878.

Brick, I.E., & Ravid, S.A. (1985). On the relevance of debt maturity structure. *Journal of Finance,* 40, 1423-1437.

Booth, L., Aviazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *Journal of Finance,* 56, 87-130.

Chen, J.J. (2004). Determinants of capital structure of Chinese listed companies. *Journal of Business Research,* 57, 1341-1351.

Dang, V. A. (2011). Leverage, debt maturity and firm investment: An empirical analysis. *Journal of Business Finance and Accounting*, 225-258.

De Jong, A., Kabir, R., & Nguyen, T. (2008). Capital structure around the world; The roles of firm and country specific determinants. *Journal of Banking and Finance,* 32, 1954-1969.

Delcoure, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics and Finance,* 16, 400-415.

Demirguc-Kunt, A., & Maksimovic, V. (1999). Institutions, financial markets and firm debt maturity. *Journal of Financial Economics*, 54, 295-336.

Diamond, D.W. (1991). Debt maturity structure and Liquidity Risk. *Quarterly Journal of Economics,* 106, 709-737.

Diamond, D.W. (1993). Seniority and maturity of debt contracts. *Journal of Financial Economics,* 33, 341-68.

Elyasiani. E., Guo, L., & Tang, L. (2002). The determinants of debt maturity at issuance: A system-based model. *Review of Quantitative Finance and Accounting,* 19, 351-377.

Flannery, M. J. (1986). Asymmetric information and risky debt maturity choice, *Journal of Finance,* 41, 19-37.

Guedes, J., & Opler, T. (1996). The determinants of the maturity of corporate debt issues. *Journal of Finance,* 51, 1809-183.

Gujarati, D.N. (2007). *Dasar-dasar ekonometrika*. Jakarta: Erlangga

Gujarati, D.N., & Porter, D.C (2009). *Basic econometric.* Fifth Edition, Singapore: Mc Graw Hill.

Guney, Y., & Ozkan, A. (2005). New insights on the importance of agency costs for corporate debt maturity decisions. *Applied Financial Economics Letters,* 1, 233-238.

Harris, M., & Raviv, A. (1991). The theory of capital structure. *Journal of Finance,* 46, 297-355.

Jensen, M. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review,* 76, 323-339.

Jensen, M. C., & Meckling, W. (1976). Theory of the firm: Managerial Behavior, Agency costs and ownership structure. *Journal of Financial Economics,* 3, 305-360.

Johnson, S. A. (1997). An empirical analysis of the determinants of corporate debt ownership structure. *Journal of Financial and Quantitative Analysis,* 32(1), 47-69.

Johnson, S. A. (2003). Debt maturity and the effects of growth opportunities and liquidity risk on leverage. *Review of Financial Studies,* 16(1), 209-236.

Kim, C.S, Mauer, D.C., & Stohs, M.H. (1995). Corporate debt maturity policy and investor tax-timing options: Theory and evidence. *Financial Management,* 24, 33–45.

Lang, L., Ofek, E., & Stulz, R.M. (1996). Leverage, investment and firm growth. *Journal Financal Economics,* 40, 3-29

Leland, H.E., & Toft, K.B. (1996). Optimal capital structure, endogenous bankruptcy, and the term structure of credit spreads. *Journal of Finance,* 51, 987–1019.

Megginson, W.L., (1997). Corporate Finance Theory. *Addison Wesley Educational Publishers.*

Modigliani, F., & Miller, M.H. (1958). The cost of capital, corporate finance and the theory of investment. American Economic Review, 48, 201-97.

Myers, S.C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147–175.

Myers, S.C. (1984). The capital structure puzzle. *Journal of Finance*, 39, 575-592.

Mustapha, M., Ismail, H., & Minai, B. (2011). Determinants of debt structure: Empirical evidence from Malaysia, *2nd International Conference on Business and Economic Research Proceeding*.

Ozkan, A. (2001). Determinants of capital structure and adjustment to long run target: Evidence from UK company panel data. *Journal of Business Finance and Accounting*, 28 (1), 175-198.

Ozkan, A. (2002). The determinants of corporate debt maturity: evidence from UK Firms. *Applied Financial Economics*, 12 (1), 19-24.

Rajan, R.G., & Zingales, L. (1995). What do we know about capital structure? some evidence from international data. *The Journal of Finance,* 50(5), 1421 – 1460.

Rozali, M.B., & Omar, M.A. (2011). An empirical analysis of corporate debt maturity structure: Evidence from Malaysian Sukuk Issues. *Journal of Muamalat and Islamic Finance Research*, Vol. 8/1.

Ross, S. (1977). The determination of financial structure: The incentive signaling approach. *Bell Journal of Economics,* 8, 23-40.

Sanyal, P., & Bulan, L.T. (2011). Regulatory risk, market uncertainties, and firm financing choice: Evidence from U.S. electricity market restructuring. The Quarterly Review of Economics and Finance, 51, 248-268.

S, Gurcharan. (2010). A review of optimal capital structure determinant of Selected ASEAN Countries. *International Research Journal of Finance and Economics,* 47, 33-42.

Smith, C. (1986). Investment banking and the capital acquisition process. *Journal of Financial Economics,* 15: 3-29.

Spiegel, Yossef., & Daniel F. Spulber, (1994). The capital structure of a regulated firm. *Rand Journal of Economics,* 25, 424-440

Stephan, A., Talavera, O., & Tsapin, A. (2011). Corporate debt maturity choice in emerging financial markets. *The Quarterly Review of Economics and Finance,* 51,141–151.

Sunarsih. (2004). Analisis simultanitas kebijakan hutang dan kebijakan maturitas hutang serta faktor-faktor yang mempengaruhinya. *Jurnal Siasat Bisnis,* 9 (1), 65-84.

Stohs, M. H., & Mauer, D. C. (1996). The determinants of corporate debt maturity structure. *Journal of Business,* 69, 279- 312.

Stulz, R. (1990). Managerial discretion and optimal financing policies. *Journal of Finance Economics,* 26, 3-28.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice.

Journal of Finance, 43, 1–19.

Wald, J.K. (1999). How firm characteristics affect capital structure: an international comparison. *The Journal of Financial Research*, 22, 161-187.

APPENDICES

Sample data of listed firm in Bursa Malaysia

		INDUSTRY	
No	Name of Companies	Bursa Malaysia	Datastream
1	A & M REALTY BHD [S]	Property	Real Estate Hold, Dev
2	A-RANK BHD [S]	Industrial Products	Aluminum
3	ABRIC BHD [S]	Industrial Products	Electrical Equipment
4	ACOUSTECH BHD [S]	Consumer	Consumer Electronics
5	ADVANCE SYNERGY BHD	Trading/Services	Hotels
6	ADVANCED PACKAGING TECHNOLOGY (M) BHD [S]	Industrial Products	Containers & Package
7	ADVENTA BHD [S]	Industrial Products	Medical Supplies
8	AE MULTI HOLDINGS BHD [S]	Industrial Products	Electrical Equipment
9	AEON CO (M) BHD [S]	Trading/Services	Broadline Retailers
10	AHB HOLDINGS BHD [S]	Trading/Services	Furnishings
11	AHMAD ZAKI RESOURCES BHD [S]	Construction	Heavy Construction
12	AIC CORPORATION BHD [S]	Technology	Semiconductors
13	AIKBEE RESOURCES BHD [S]	Industrial Products	Forestry
14	AIRASIA BHD [S]	Trading/Services	Airlines
15	AJINOMOTO (M) BHD [S]	Consumer	Food Products
16	AJIYA BHD [S]	Industrial Products	Building Mat.& Fix.
17	ALAM MARITIM RESOURCES BHD [S]	Trading/Services	Oil Equip. & Services
18	ALIRAN IHSAN RESOURCES BHD	Infrastructure Projects	Water
19	ALUMINIUM COMPANY OF MALAYSIA BHD [S]	Industrial Products	Aluminum
20	AMALGAMATED INDUSTRIAL STEEL BHD [S]	Industrial Products	Iron & Steel
21	AMCORP PROPERTIES BHD [S]	Property	Divers. Industrials
22	AMTEK HOLDINGS BHD [S]	Consumer	Clothing & Accessory
23	AMTEL HOLDINGS BHD [S]	Technology	Telecom. Equipment
24	AMWAY (M) HOLDINGS BHD [S]	Trading/Services	Broadline Retailers
25	ALABS RESOURCES BHD [S]	Trading/Services	Waste, Disposal Svs.
26	ANCOM BHD [S]	Industrial Products	Specialty Chemicals
27	ANN JOO RESOURCES BHD [S]	Industrial Products	Iron & Steel
28	APB RESOURCES BHD [S]	Industrial Products	Industrial Machinery
29	APEX HEALTHCARE BHD [S]	Consumer	Pharmaceuticals
30	APM AUTOMOTIVE HOLDINGS BHD [S]	Industrial Products	Auto Parts
31	APOLLO FOOD HOLDINGS BHD [S]	Consumer	Food Products
32	ARK RESOURCES BHD [S]	Construction	Heavy Construction
33	ASAS DUNIA BHD [S]	Property	Real Estate Hold, Dev
34	ASIA FILE CORPORATION BHD [S]	Consumer	Dur. Household Prod.
35	ASIA PACIFIC LAND BHD	Property	Real Estate Hold, Dev
36	ASIAN PAC HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
37	ASTINO BHD [S]	Industrial Products	Building Mat.& Fix.
38	ASTRAL ASIA BHD [S]	Plantation	Farming & Fishing
39	ASTRAL SUPREME BHD [S]	Industrial Products	Clothing & Accessory

40	ATIS CORPORATION BHD [S]	Trading/Services	Electronic Equipment
41	ATLAN HOLDINGS BHD [S]	Industrial Products	Industrial Machinery
42	ATURMAJU RESOURCES BHD [S]	Industrial Products	Building Mat.& Fix.
43	AUTOAIR HOLDINGS BHD [S]	Industrial Products	Auto Parts
44	AUTOV CORPORATION BHD [S]	Industrial Products	Auto Parts
45	AWC BHD [S]	Trading/Services	Business Support Svs.
46	AXIATA GROUP BHD [S]	Trading/Services	Mobile Telecom.
47	AYER MOLEK RUBBER CO BHD, THE [S]	Plantation	Real Estate Hold, Dev
48	BANDAR RAYA DEVELOPMENTS BHD [S]	Property	Real Estate Hold, Dev
49	BANENG HOLDINGS BHD [S]	Consumer	Clothing & Accessory
50	BATU KAWAN BHD [S]	Plantation	Commodity Chemicals
51	BCB BHD [S]	Property	Real Estate Hold, Dev
52	BERJAYA CORPORATION BHD	Trading/Services	Broadline Retailers
53	BERJAYA ASSETS BERHAD	Property	Gambling
54	BERJAYA FOOD BHD	Trading/Services	Restaurants & Bars
55	BERJAYA LAND BHD	Trading/Services	Gambling
56	BERJAYA MEDIA BHD [S]	Trading/Services	Publishing
57	BERJAYA SPORTS TOTO BHD	Trading/Services	Gambling
58	BERTAM ALLIANCE BHD [S]	Property	Real Estate Hold, Dev
59	BHS INDUSTRIES BHD [S]	Trading/Services	Business Support Svs.
60	BIG INDUSTRIES BHD [S]	Industrial Products	Building Mat.& Fix.
61	BI DARULAMAN BHD [S]	Property	Heavy Construction
62	BI GOODYEAR BHD [S]	Construction	Heavy Construction
63	BI PURI HOLDINGS BHD [S]	Construction	Heavy Construction
64	BINTAI KINDEN CORPORATION BHD [S]	Trading/Services	Heavy Construction
65	BINTULU PORT HOLDINGS BHD [S]	Trading/Services	Transport Services
66	BIO OSMO BHD [S]	Consumer	Soft Drinks
67	BIOSIS GROUP BHD [S]	Consumer	Persol Products
68	BLD PLANTATION BHD [S]	Plantation	Farming & Fishing
69	BOLTON BHD [S]	Property	Real Estate Hold, Dev
70	BONIA CORPORATION BHD [S]	Consumer	Clothing & Accessory
71	BOON KOON GROUP BHD [S]	Industrial Products	Comm. Vehicles,Trucks
72	BORNEO OIL BHD [S]	Trading/Services	Restaurants & Bars
73	BOUSTEAD HEAVY INDUSTRIES CORP BHD [S]	Industrial Products	Comm. Vehicles,Trucks
74	BOUSTEAD HOLDINGS BHD	Plantation	Industrial Suppliers
75	BOX-PAK (MALAYSIA) BHD [S]	Industrial Products	Containers & Package
76	BP PLASTICS HOLDING BHD [S]	Industrial Products	Specialty Chemicals
77	BRAHIM S H	Logistic	Logistic.
78	BREM HOLDINGS BHD [S]	Construction	Heavy Construction
79	BRIGHT PACKAGING INDUSTRY BHD	Industrial Products	Containers & Package
80	BRITISH AMERICAN TOBACCO (M) BHD	Consumer	Tobacco
81	BSL CORPORATION BERHAD [S]	Industrial Products	Electrical Equipment
82	BTM RESOURCES BHD [S]	Industrial Products	Building Mat.& Fix.
83	CAB CAKARAN CORPORATION BHD [S]	Consumer	Farming & Fishing

84	CAELY HOLDINGS BHD [S]	Consumer	Clothing & Accessory
85	CAHYA MATA SARAWAK BHD [S]	Industrial Products	Building Mat.& Fix.
86	CAM RESOURCES BHD [S]	Consumer	Dur. Household Prod.
87	CAN-ONE BHD [S]	Industrial Products	Containers & Package
88	CARLSBERG BREWERY MALAYSIA BHD	Consumer	Brewers
89	CB INDUSTRIAL PRODUCT HOLDING BHD [S]	Industrial Products	Industrial Machinery
90	CBS TECHNOLOGY BHD [S]	Technology	Software
91	CCK CONSOLIDATED HOLDINGS BHD [S]	Consumer	Food Products
92	CCM DUOPHARMA BIOTECH BHD [S]	Consumer	Pharmaceuticals
93	CENTRAL INDUSTRIAL CORPORATION BHD [S]	Industrial Products	Specialty Chemicals
94	CENTURY BOND BHD [S]	Industrial Products	Containers & Package
95	CENTURY LOGISTICS HOLDINGS BHD [S]	Trading/Services	Transport Services
96	CEPATWAWASAN GROUP BHD [S]	Plantation	Farming & Fishing
97	CHEE WAH CORPORATION BHD [S]	Consumer	Dur. Household Prod.
98	CHEETAH HOLDINGS BHD [S]	Trading/Services	Apparel Retailers
99	CHEMICAL COMPANY OF MALAYSIA BHD [S]	Industrial Products	Specialty Chemicals
100	CHIN TECK PLANTATIONS BHD [S]	Plantation	Farming & Fishing
101	CHIN WELL HOLDINGS BHD [S]	Industrial Products	Industrial Machinery
102	CHOO BEE METAL INDUSTRIES BHD	Industrial Products	Industrial Machinery
103	CHUAN HUAT RESOURCES BHD [S]	Industrial Products	Building Mat.& Fix.
104	CI HOLDINGS BHD [S]	Consumer	Soft Drinks
105	CLASSIC SCENIC BHD [S]	Consumer	Furnishings
106	CME GROUP BHD [S]	Trading/Services	Comm. Vehicles,Trucks
107	CN ASIA CORPORATION BHD [S]	Industrial Products	Industrial Machinery
108	CNI HOLDINGS BHD [S]	Trading/Services	Persol Products
109	COASTAL CONTRACTS BHD [S]	Industrial Products	Comm. Vehicles,Trucks
110	COCOALAND HOLDINGS BHD [S]	Consumer	Food Products
111	COMINTEL CORPORATION BHD [S]	Technology	Electrical Equipment
112	COMPLETE LOGISTIC SERVICES BHD [S]	Trading/Services	Marine Transportation
113	COMPUGATES HOLDINGS BHD [S]	Trading/Services	Industrial Suppliers
114	COMPUTER FORMS (M) BHD [S]	Industrial Products	Business Support Svs.
115	CONCRETE ENGINEERING PRODUCTS BHD [S]	Industrial Products	Building Mat.& Fix.
116	COUNTRY HEIGHTS HOLDINGS BHD	Property	Real Estate Hold, Dev
117	COUNTRY VIEW BHD [S]	Property	Real Estate Hold, Dev
118	CRESCENDO CORPORATION BHD [S]	Property	Real Estate Hold, Dev
119	CREST BUILDER HOLDINGS BHD [S]	Construction	Heavy Construction
120	CSC STEEL HOLDINGS BHD [S]	Industrial Products	Iron & Steel
121	CYCLE & CARRIAGE BINTANG BHD [S]	Consumer	Specialty Retailers
122	CYL CORPORATION BHD [S]	Industrial Products	Containers & Package
123	CYMAO HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
124	CYPARK RESOURCES BHD [S]	Trading/Services	Waste, Disposal Svs.
125	D & O GREEN TECHNOLOGIES BHD [S]	Technology	Semiconductors
126	D'NONCE TECHNOLOGY BHD [S]	Industrial Products	Containers & Package
127	DAIBOCHI PLASTIC & PACKAGING INDS BHD [S]	Industrial Products	Containers & Package

128	DAIMAN DEVELOPMENT BHD [S]	Property	Real Estate Hold, Dev
129	DAMANSARA REALTY BHD [S]	Property	Real Estate Hold, Dev
130	DATAPREP HOLDINGS BHD [S]	Technology	Computer Services
131	DAYA MATERIALS BHD [S]	Trading/Services	Specialty Chemicals
132	DAYANG ENTERPRISE HOLDINGS BHD [S]	Trading/Services	Oil Equip. & Services
133	DBE GURNEY RESOURCES BHD [S]	Consumer	Farming & Fishing
134	DEGEM BHD [S]	Consumer	Clothing & Accessory
135	DELEUM BHD [S]	Trading/Services	Oil Equip. & Services
136	DELLOYD VENTURES BHD [S]	Industrial Products	Auto Parts
137	DENKO INDUSTRIAL CORPORATION BHD [S]	Industrial Products	Specialty Chemicals
138	DESTINI	Manufacture	Manufacture
139	DIALOG GROUP BHD [S]	Trading/Services	Oil Equip. & Services
140	DIGICOM BHD [S]	Infrastructure Projects	Mobile Telecom.
141	DIJAYA CORPORATION BHD [S]	Property	Real Estate Hold, Dev
142	DKLS INDUSTRIES BHD [S]	Construction	Heavy Construction
143	DKSH HOLDINGS(M)BHD [S]	Trading/Services	Industrial Suppliers
144	DOLOMITE CORPORATION BHD [S]	Industrial Products	Building Mat.& Fix.
145	DOMINT ENTERPRISE BHD [S]	Industrial Products	Building Mat.& Fix.
146	DPS RESOURCES BHD [S]	Consumer	Building Mat.& Fix.
147	DRB-HICOM BHD	Industrial Products	Comm. Vehicles,Trucks
148	DUFU TECHNOLOGY CORP BHD [S]	Industrial Products	Electrical Equipment
149	DUTALAND BHD [S]	Plantation	Farming & Fishing
150	DUTCH LADY MILK INDUSTRIES BHD [S]	Consumer	Food Products
151	DXN HOLDINGS BHD [S]	Consumer	Food Products
152	EASTERN & ORIENTAL BHD [S]	Property	Real Estate Hold, Dev
153	EASTERN PACIFIC INDUSTRIAL CORP BHD [S]	Trading/Services	Oil Equip. & Services
154	ECOFIRST CONSOLIDATED BHD [S]	Trading/Services	Heavy Construction
155	ECS ICT BHD [S]	Technology	Computer Services
156	EDARAN BHD [S]	Trading/Services	Computer Services
157	EDEN INC BHD [S]	Trading/Services	Con. Electricity
158	EFFICIENT E-SOLUTIONS BHD [S]	Trading/Services	Business Support Svs.
159	EG INDUSTRIES BHD [S]	Industrial Products	Consumer Electronics
160	EKOVEST BHD [S]	Construction	Heavy Construction
161	EKOWOOD INTERTIOL BHD [S]	Consumer	Building Mat.& Fix.
162	EKSONS CORPORATION BHD [S]	Industrial Products	Forestry
163	EMAS KIARA INDUSTRIES BHD [S]	Industrial Products	Specialty Chemicals
164	EMICO HOLDINGS BHD [S]	Consumer	Dur. Household Prod.
165	EMIVEST BHD [S]	Consumer	Farming & Fishing
166	ENCORP BHD	Property	Real Estate Hold, Dev
167	ENG KAH CORPORATION BHD [S]	Consumer	Persol Products
168	ENG TEKNOLOGI HOLDINGS BHD [S]	Technology	Electronic Equipment
169	ENGTEX GROUP BHD [S]	Trading/Services	Building Mat.& Fix.
170	EONMETALL GROUP BHD [S]	Industrial Products	Iron & Steel
171	EP MANUFACTURING BHD [S]	Industrial Products	Auto Parts

172	EQUINE CAPITAL BHD [S]	Property	Real Estate Hold, Dev
173	ESSO MALAYSIA BHD [S]	Industrial Products	Exploration & Prod.
174	ESTHETICS INTERTIOL GROUP BHD [S]	Trading/Services	Persol Products
175	ETI TECH CORPORATION BHD [S]	Technology	Nondur.Household Prod
176	EUPE CORPORATION BHD [S]	Property	Real Estate Hold, Dev
177	EURO HOLDINGS BHD [S]	Consumer	Furnishings
178	EUROSPAN HOLDINGS BHD [S]	Consumer	Furnishings
179	EVERGREEN FIBREBOARD BHD [S]	Industrial Products	Building Mat.& Fix.
180	EVERSENDAI CORP	Manufacture	Manufacture
181	EWEIN BHD [S]	Industrial Products	Electrical Equipment
182	EXCEL FORCE MSC BHD [S]	Technology	Software
183	FABER GROUP BHD	Trading/Services	Healthcare Providers
184	FACB INDUSTRIES INCORPORATED BHD [S]	Industrial Products	Iron & Steel
185	FAJARBARU BUILDER GROUP BHD [S]	Construction	Heavy Construction
186	FAR EAST HOLDINGS BHD [S]	Plantation	Farming & Fishing
187	FARLIM GROUP (M) BHD [S]	Property	Real Estate Hold, Dev
188	FARM'S BEST BHD [S]	Consumer	Farming & Fishing
189	FAVELLE FAVCO BHD [S]	Industrial Products	Comm. Vehicles,Trucks
190	FCW HOLDINGS BHD [S]	Consumer	Telecom. Equipment
191	FEDERAL FURNITURE HOLDINGS (M) BHD [S]	Consumer	Furnishings
192	FIAMMA HOLDINGS BHD [S]	Trading/Services	Home Improvement Ret.
193	FIBON BHD [S]	Industrial Products	Specialty Chemicals
194	FIMA CORPORATION BHD [S]	Industrial Products	Business Support Svs.
195	FITTERS DIVERSIFIED BHD [S]	Trading/Services	Electronic Equipment
196	FOCAL AIMS HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
197	FORMIS RESOURCES BHD [S]	Technology	Computer Services
198	FORMOSA PROSONIC INDUSTRIES BHD [S]	Consumer	Consumer Electronics
199	FRASER & NEAVE	Beverage	Beverage
200	FREIGHT MAGEMENT HLDGS BHD [S]	Trading/Services	Transport Services
201	FRONTKEN CORPORATION BHD [S]	Trading/Services	Industrial Machinery
202	FSBM HOLDINGS BHD [S]	Trading/Services	Computer Services
203	FURNIWEB INDUSTRIAL PRODUCTS BHD [S]	Industrial Products	Clothing & Accessory
204	FURQAN BUSINESS ORGANISATION BHD [S]	Trading/Services	Travel & Tourism
205	FUTUTECH BHD [S]	Industrial Products	Building Mat.& Fix.
206	GADANG HOLDINGS BHD [S]	Construction	Heavy Construction
207	GAMUDA BHD [S]	Construction	Heavy Construction
208	GE-SHEN CORPORATION BHD [S]	Industrial Products	Industrial Machinery
209	GEFUNG HOLDING BHD [S]	Industrial Products	Building Mat.& Fix.
210	GENTING BHD	Trading/Services	Hotels
211	RESORTS WORLD BHD	Trading/Services	Hotel
212	GENTING PLANTATIONS BHD	Plantation	Farming & Fishing
213	GEORGE KENT (M) BHD [S]	Trading/Services	Industrial Machinery
214	GHL SYSTEMS BHD [S]	Technology	Computer Services
215	GLENEALY PLANTATIONS (M) BHD [S]	Plantation	Farming & Fishing

216	GLOBAL CARRIERS BHD [S]	Trading/Services	Marine Transportation
217	GLOBETRONICS TECHNOLOGY BHD [S]	Technology	Semiconductors
218	GLOMAC BHD [S]	Property	Real Estate Hold, Dev
219	GOH BAN HUAT BHD [S]	Industrial Products	Building Mat.& Fix.
220	GOLDEN FRONTIER BHD [S]	Industrial Products	Containers & Package
221	GOLDEN LAND BHD [S]	Plantation	Farming & Fishing
222	GOLDEN PHAROS BHD [S]	Consumer	Building Mat.& Fix.
223	GOLDEN PLUS HOLDINGS BHD	Property	Real Estate Hold, Dev
224	GOLDIS BHD	Consumer	Divers. Industrials
225	GOLSTA SYNERGY BHD [S]	Trading/Services	Industrial Machinery
226	GOODWAY INTEGRATED INDUSTRIES BHD [S]	Industrial Products	Tires
227	GOPENG BHD [S]	Industrial Products	Farming & Fishing
228	GPA HOLDINGS BHD [S]	Industrial Products	Auto Parts
229	GRAND CENTRAL ENTERPRISES BHD	Hotel	Hotels
230	GRAND HOOVER BHD [S]	Construction	Heavy Construction
231	GREEN PACKET BHD [S]	Technology	Software
232	GROMUTUAL BHD [S]	Property	Real Estate Hold, Dev
233	GSB GROUP BHD	Industrial Products	Consumer Electronics
234	GUAN CHONG BHD [S]	Consumer	Food Products
235	GUH HOLDINGS BHD [S]	Industrial Products	Electrical Equipment
236	GUINNESS ANCHOR BHD	Consumer	Brewers
237	GUNUNG CAPITAL BERHAD [S]	Industrial Products	Commodity Chemicals
238	GUOCOLAND (MALAYSIA) BHD	Property	Real Estate Hold, Dev
239	GW PLASTICS HLDGS BHD [S]	Industrial Products	Containers & Package
240	HAI-O ENTERPRISE BHD	Trading/Services	Food Retail,Wholesale
241	HAISAN RESOURCES BHD [S]	Trading/Services	Industrial Machinery
242	HALEX HOLDINGS BHD [S]	Industrial Products	Specialty Chemicals
243	HANDAL RESOURCES BHD [S]	Trading/Services	Oil Equip. & Services
244	HAP SENG CONSOLIDATED BHD [S]	Trading/Services	Specialty Chemicals
245	HAP SENG PLANTATIONS HOLDINGS BHD [S]	Plantation	Farming & Fishing
246	HARBOUR-LINK GROUP BHD [S]	Trading/Services	Transport Services
247	HARN LEN CORPORATION BHD [S]	Plantation	Farming & Fishing
248	HARRISONS HOLDINGS (M) BHD	Trading/Services	Industrial Suppliers
249	HARTALEGA HOLDINGS BHD [S]	Industrial Products	Medical Supplies
250	HARVEST COURT INDUSTRIES BHD [S]	Industrial Products	Forestry
251	HEITECH PADU BHD [S]	Technology	Computer Services
252	HELP INTERTIOL CORPORATION BHD [S]	Trading/Services	Spec.Consumer Service
253	HEVEABOARD BHD [S]	Industrial Products	Building Mat.& Fix.
254	HEXAGON HOLDINGS BHD [S]	Trading/Services	Industrial Machinery
255	HEXZA CORPORATION BHD	Industrial Products	Specialty Chemicals
256	HIAP TECK VENTURE BHD [S]	Industrial Products	Iron & Steel
257	HIL INDUSTRIES BHD [S]	Industrial Products	Industrial Machinery
258	HING YIAP GROUP BHD [S]	Consumer	Clothing & Accessory
259	HIROTAKO HOLDINGS BHD [S]	Industrial Products	Auto Parts

260	HO HUP CONSTRUCTION COMPANY BHD [S]	Construction	Heavy Construction
261	HO WAH GENTING BHD [S]	Industrial Products	Electrical Equipment
262	HOCK HENG STONE INDUSTRIES BHD [S]	Industrial Products	Building Mat.& Fix.
263	HOCK LOK SIEW CORPORATION BHD [S]	Consumer	Consumer Electronics
264	HOCK SENG LEE BHD [S]	Construction	Heavy Construction
265	HOCK SIN LEONG GROUP BHD [S]	Trading/Services	Consumer Electronics
266	HOMERITZ CORPORATION BHD [S]	Consumer	Furnishings
267	HONG LEONG INDUSTRIES BHD [S]	Consumer	Semiconductors
268	HOVID BHD [S]	Consumer	Pharmaceuticals
269	HUA YANG BHD [S]	Property	Real Estate Hold, Dev
270	HUAT LAI RESOURCES BHD	Consumer	Farming & Fishing
271	HUBLINE BHD [S]	Trading/Services	Marine Transportation
272	HUNZA PROPERTIES BHD [S]	Property	Real Estate Hold, Dev
273	HUP SENG INDUSTRIES BHD [S]	Consumer	Food Products
274	HWA TAI INDUSTRIES BHD [S]	Consumer	Food Products
275	HYTEX INTEGRATED BHD [S]	Consumer	Clothing & Accessory
276	I-BHD [S]	Property	Real Estate Hold, Dev
277	IBRACO BHD [S]	Property	Real Estate Hold, Dev
278	IGB CORPORATION BHD	Property	Real Estate Hold, Dev
279	IJM CORPORATION BHD [S]	Construction	Heavy Construction
280	IJM LAND BHD [S]	Property	Real Estate Hold, Dev
281	IJM PLANTATIONS BHD [S]	Plantation	Farming & Fishing
282	IMASPRO CORPORATION BHD [S]	Industrial Products	Specialty Chemicals
283	INDUSTRONICS BHD [S]	Technology	Electronic Equipment
284	INGRESS CORPORATION BHD [S]	Industrial Products	Auto Parts
285	INNOPRISE PLANTATIONS BHD [S]	Industrial Products	Forestry
286	INTEGRATED LOGISTICS BHD [S]	Trading/Services	Transport Services
287	INTEGRATED RUBBER CORPORATION BHD [S]	Industrial Products	Medical Supplies
288	INTEGRAX BHD [S]	Trading/Services	Transport Services
289	IOI CORPORATION BHD [S]	Plantation	Farming & Fishing
290	IPMUDA BHD [S]	Trading/Services	Industrial Suppliers
291	IQ GROUP HOLDINGS BHD [S]	Consumer	Electrical Equipment
292	IRE-TEX CORPORATION BHD [S]	Industrial Products	Containers & Package
293	IREKA CORPORATION BHD [S]	Construction	Heavy Construction
294	IRM GROUP BHD [S]	Industrial Products	Commodity Chemicals
295	IVORY PROPERTIES GROUP BHD [S]	Property	Real Estate Hold, Dev
296	JADI IMAGING HOLDINGS BHD [S]	Industrial Products	Specialty Chemicals
297	JAKS RESOURCES BERHAD [S]	Construction	Iron & Steel
298	JASA KITA BHD [S]	Industrial Products	Electrical Equipment
299	JAVA BHD [S]	Industrial Products	Building Mat.& Fix.
300	JAYA TIASA HOLDINGS BHD [S]	Industrial Products	Forestry
301	JAYCORP BHD [S]	Consumer	Furnishings
302	JCY INTERTIOL BHD [S]	Technology	Computer Hardware
303	JERASIA CAPITAL BHD [S]	Consumer	Clothing & Accessory

304	JMR CONGLOMERATION BHD [S]	Industrial Products	Building Mat.& Fix.
305	JOBSTREET CORPORATION BHD [S]	Trading/Services	Bus.Train & Employmnt
306	JOHORE TIN BHD [S]	Industrial Products	Containers & Package
307	JOTECH HOLDINGS BHD [S]	Industrial Products	Industrial Machinery
308	JT INTERTIOL BHD	Consumer	Tobacco
309	K-STAR SPORTS LIMITED [S]	Consumer	Footwear
310	KAMDAR GROUP (M) BHD [S]	Trading/Services	Apparel Retailers
311	KARAMBUI CORP BHD	Property	Real Estate Hold, Dev
312	KAWAN FOOD BHD [S]	Consumer	Food Products
313	KBB RESOURCES BHD [S]	Consumer	Food Products
314	KBES BHD [S]	Trading/Services	Travel & Tourism
315	KECK SENG (M) BHD [S]	Industrial Products	Farming & Fishing
316	KEIN HING INTERTIOL BHD [S]	Industrial Products	Industrial Machinery
317	KEJURUTERAAN SAMUDRA TIMUR BHD [S]	Trading/Services	Oil Equip. & Services
318	KELADI MAJU BHD [S]	Property	Real Estate Hold, Dev
319	KEN HOLDINGS BHD [S]	Construction	Real Estate Hold, Dev
320	KENCA PETROLEUM BHD [S]	Trading/Services	Oil Equip. & Services
321	KESM INDUSTRIES BHD [S]	Technology	Semiconductors
322	KEY ASIC BERHAD [S]	Technology	Semiconductors
323	KFC HOLDINGS (M) BHD [S]	Trading/Services	Restaurants & Bars
324	KHEE SAN BHD [S]	Consumer	Food Products
325	KHIND HOLDINGS BHD [S]	Consumer	Dur. Household Prod.
326	KIA LIM BHD [S]	Industrial Products	Building Mat.& Fix.
327	KIAN JOO CAN FACTORY BHD	Industrial Products	Containers & Package
328	KIM HIN INDUSTRY BHD [S]	Industrial Products	Building Mat.& Fix.
329	KIM LOONG RESOURCES BHD [S]	Plantation	Farming & Fishing
330	KIMLUN CORPORATION BHD [S]	Construction	Heavy Construction
331	KINSTEEL BHD [S]	Industrial Products	Iron & Steel
332	KKB ENGINEERING BHD [S]	Industrial Products	Industrial Machinery
333	KLCC PROPERTY HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
334	KLUANG RUBBER CO (M) BHD	Plantation	Farming & Fishing
335	KNM GROUP BHD [S]	Industrial Products	Oil Equip. & Services
336	KNUSFORD BHD [S]	Trading/Services	Industrial Machinery
337	KOBAY TECHNOLOGY BHD [S]	Technology	Industrial Machinery
338	KOMARKCORP BHD [S]	Industrial Products	Nondur.Household Prod
339	KONSORTIUM LOGISTIK BHD [S]	Trading/Services	Transport Services
340	KONSORTIUM TRANSSIOL BHD [S]	Trading/Services	Travel & Tourism
341	KOSSAN RUBBER INDUSTRIES BHD [S]	Industrial Products	Medical Supplies
342	KOTRA INDUSTRIES BHD [S]	Consumer	Pharmaceuticals
343	KPJ HEALTHCARE BHD [S]	Trading/Services	Healthcare Providers
344	KPS CONSORTIUM BHD [S]	Trading/Services	Building Mat.& Fix.
345	KRETAM HOLDINGS BHD [S]	Plantation	Farming & Fishing
346	KRISASSETS HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
347	KSL HOLDINGS BHD [S]	Property	Real Estate Hold, Dev

348	KUALA LUMPUR KEPONG BHD [S]	Plantation	Farming & Fishing
349	KUANTAN FLOUR MILLS BHD [S]	Consumer	Food Products
350	KUB MALAYSIA BHD [S]	Trading/Services	Divers. Industrials
351	KUCHAI DEVELOPMENT BHD [S]	Mining	Specialty Fince
352	KULIM (M) BHD [S]	Plantation	Farming & Fishing
353	KUMPULAN EUROPLUS BHD	Construction	Building Mat.& Fix.
354	KUMPULAN FIMA BHD [S]	Trading/Services	Divers. Industrials
355	KUMPULAN H&L HIGH-TECH BHD [S]	Trading/Services	Industrial Machinery
356	KUMPULAN HARTAH SELANGOR BHD [S]	Property	Real Estate Hold, Dev
357	KUMPULAN JETSON BHD [S]	Construction	Heavy Construction
358	KUMPULAN PERANGSANG SELANGOR BHD [S]	Trading/Services	Water
359	KUMPULAN POWERNET BHD [S]	Industrial Products	Clothing & Accessory
360	KWANTAS CORPORATION BHD [S]	Plantation	Farming & Fishing
361	KYM HOLDINGS BHD [S]	Industrial Products	Containers & Package
362	LAFARGE MALAYAN CEMENT BHD [S]	Industrial Products	Building Mat.& Fix.
363	LAND & GENERAL BHD	Property	Real Estate Hold, Dev
364	LANDMARKS BHD	Hotel	Hotels
365	LATEXX PARTNERS BHD [S]	Industrial Products	Medical Supplies
366	LATITUDE TREE HOLDINGS BHD [S]	Consumer	Furnishings
367	LAY HONG BHD [S]	Consumer	Farming & Fishing
368	LB ALUMINIUM BHD [S]	Industrial Products	Aluminum
369	LBI CAPITAL BHD [S]	Property	Real Estate Hold, Dev
370	LBS BI GROUP BHD [S]	Property	Real Estate Hold, Dev
371	LCTH CORPORATION BHD [S]	Industrial Products	Industrial Machinery
372	LEADER STEEL HOLDINGS BHD [S]	Industrial Products	Iron & Steel
373	LEADER UNIVERSAL HOLDINGS BHD [S]	Industrial Products	Electrical Equipment
374	LEBAR DAUN BHD [S]	Construction	Heavy Construction
375	LEE SWEE KIAT GROUP BHD [S]	Consumer	Furnishings
376	LEN CHEONG HOLDING BHD [S]	Consumer	Furnishings
377	LEONG HUP HOLDINGS BHD [S]	Consumer	Farming & Fishing
378	LEWEKO RESOURCES BHD [S]	Industrial Products	Building Mat.& Fix.
379	LFE CORPORATION BHD [S]	Trading/Services	Industrial Machinery
380	LIEN HOE CORPORATION BHD [S]	Property	Heavy Construction
381	LII HEN INDUSTRIES BHD [S]	Consumer	Furnishings
382	LINEAR CORPORATION BHD	Industrial Products	Industrial Machinery
383	LINGKARAN TRANS KOTA HOLDINGS BHD [S]	Infrastructure Projects	Transport Services
384	LINGUI DEVELOPMENT BHD [S]	Industrial Products	Forestry
385	LION CORPORATION BHD [S]	Industrial Products	Iron & Steel
386	LION DIVERSIFIED HOLDINGS BHD [S]	Industrial Products	Iron & Steel
387	LION FOREST INDUSTRIES BHD [S]	Consumer	Tires
388	LION INDUSTRIES CORPORATION BHD [S]	Industrial Products	Iron & Steel
389	LIPO CORPORATION BHD [S]	Industrial Products	Industrial Machinery
390	LONDON BISCUITS BHD [S]	Consumer	Food Products
391	LTKM BHD [S]	Consumer	Farming & Fishing

392	LUSTER INDUSTRIES BHD [S]	Industrial Products	Electrical Equipment
393	LUXCHEM CORPORATION BHD [S]	Trading/Services	Commodity Chemicals
394	LYSAGHT GALVANIZED STEEL BHD [S]	Industrial Products	Iron & Steel
395	MAG PRIMA BHD [S]	Property	Real Estate Hold, Dev
396	MAGNI-TECH INDUSTRIES BHD [S]	Industrial Products	Clothing & Accessory
397	MAH SING GROUP BHD [S]	Property	Real Estate Hold, Dev
398	MAHAJAYA BHD [S]	Property	Real Estate Hold, Dev
399	MAJOR TEAM HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
400	MAJUPERAK HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
401	MALAYAN FLOUR MILLS BHD [S]	Consumer	Food Products
402	MALAYAN UNITED INDUSTRIES BHD	Trading/Services	Broadline Retailers
403	MALAYSIA AICA BHD [S]	Industrial Products	Furnishings
404	MALAYSIA AIRPORT HOLDINGS BHD	Trading/Services	Transport Services
405	MALAYSIA MARINE AND HEAVY ENGINEERING HOLDINGS BHD [S]	Trading/Services	Oil Equip. & Services
406	MALAYSIA PACIFIC CORP BHD [S]	Property	Real Estate Hold, Dev
407	MALAYSIA PACKAGING INDUSTRY BHD	Industrial Products	Containers & Package
408	MALAYSIA SMELTING CORPORATION BHD [S]	Industrial Products	Iron & Steel
409	MALAYSIA STEEL WORKS (KL) BHD [S]	Industrial Products	Iron & Steel
410	MALAYSIAN AE MODELS HOLDINGS BHD [S]	Industrial Products	Industrial Machinery
411	MALAYSIAN AIRLINE SYSTEM BHD	Trading/Services	Airlines
412	MALAYSIAN BULK CARRIERS BHD [S]	Trading/Services	Marine Transportation
413	MLAYSN.GENOMICS RSO.CZ.	Technology	Biotechnology
414	MALAYSIAN PACIFIC INDUSTRIES BHD [S]	Technology	Semiconductors
415	MALAYSIAN RESOURCES CORPORATION BHD [S]	Construction	Heavy Construction
416	MALPAC HOLDINGS BHD	Plantation	Farming & Fishing
417	MALTON BHD [S]	Property	Heavy Construction
418	MAMEE-DOUBLE DECKER (M) BHD [S]	Consumer	Food Products
419	MARCO HOLDINGS BHD [S]	Trading/Services	Consumer Electronics
420	MASTER-PACK GROUP BHD [S]	Consumer	Containers & Package
421	MAXBIZ CORPORATION BHD [S]	Consumer	Clothing & Accessory
422	MAXIS BHD [S]	Trading/Services	Mobile Telecom.
423	MAXTRAL INDUSTRY BHD [S]	Industrial Products	Forestry
424	MBM RESOURCES BHD [S]	Trading/Services	Specialty Retailers
425	MEDA INC BHD	Property	Real Estate Hold, Dev
426	MEDIA PRIMA BHD	Trading/Services	Broadcast & Entertain
427	MEGA FIRST CORPORATION BHD [S]	Trading/Services	Con. Electricity
428	MELATI EHSAN HOLDINGS BHD [S]	Construction	Heavy Construction
429	MELEWAR INDUSTRIAL GROUP BHD [S]	Industrial Products	Iron & Steel
430	MENG CORPORATION (M) BHD [S]	Property	Real Estate Hold, Dev
431	MENTIGA CORPORATION BHD [S]	Industrial Products	Forestry
432	MERCURY INDUSTRIES BHD	Industrial Products	Building Mat.& Fix.
433	MERGE ENERGY BHD [S]	Construction	Heavy Construction
434	MESB BHD [S]	Trading/Services	Apparel Retailers
435	MESINIAGA BHD [S]	Technology	Computer Services

436	METAL RECLAMATION BHD [S]	Industrial Products	Nonferrous Metals
437	METECH GROUP BHD [S]	Industrial Products	Industrial Machinery
438	METROD (M) BHD [S]	Industrial Products	Electrical Equipment
439	METRONIC GLOBAL BHD [S]	Trading/Services	Business Support Svs.
440	MHC PLANTATIONS BHD [S]	Plantation	Farming & Fishing
441	MIECO CHIPBOARD BHD [S]	Industrial Products	Building Mat.& Fix.
442	MILUX CORPORATION BHD [S]	Consumer	Dur. Household Prod.
443	MINETECH RESOURCES BHD [S]	Industrial Products	General Mining
444	MINHO (M) BHD [S]	Industrial Products	Forestry
445	MINTYE INDUSTRIES BHD [S]	Consumer	Auto Parts
446	MISC BHD [S]	Trading/Services	Marine Transportation
447	MITHRIL BHD [S]	Industrial Products	Building Mat.& Fix.
448	MITRAJAYA HOLDINGS BHD [S]	Construction	Heavy Construction
449	MK LAND HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
450	METRO KAJANG HOLDINGS BHD	Property	Real Estate Hold, Dev
451	MMC CORPORATION BHD [S]	Trading/Services	Multiutilities
452	MTD ACPI ENGINEERING BHD [S]	Construction	Heavy Construction
453	MUAR BAN LEE GROUP BHD [S]	Industrial Products	Industrial Machinery
454	MUDA HOLDINGS BHD [S]	Industrial Products	Paper
455	MUDAJAYA GROUP BHD [S]	Construction	Heavy Construction
456	MUHIBBAH ENGINEERING (M) BHD [S]	Construction	Heavy Construction
457	MUI PROPERTIES BHD [S]	Property	Real Estate Hold, Dev
458	MULPHA INTERTIOL BHD	Trading/Services	Hotels
459	MULPHA LAND BHD [S]	Property	Real Estate Hold, Dev
460	MULTI SPORTS HOLDINGS LTD [S]	Consumer	Footwear
461	MULTI-PURPOSE HOLDINGS BHD	Trading/Services	Gambling
462	MULTI-USAGE HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
463	MULTI-CODE ELECTRONICS INDS (M) BHD [S]	Industrial Products	Auto Parts
464	MWE HOLDINGS BHD [S]	Consumer	Electrical Equipment
465	MY EG SERVICES BHD [S]	Trading/Services	Business Support Svs.
466	MYCRON STEEL BHD [S]	Industrial Products	Iron & Steel
467	DAYU PROP	Developer	Developer
468	GAMAS INTERTIOL BHD [S]	Trading/Services	Specialty Chemicals
469	IM HOLDINGS BHD [S]	Property	Heavy Construction
470	KAMICHI CORPORATION BHD [S]	Consumer	Consumer Electronics
471	RRA INDUSTRIES BHD [S]	Consumer	Furnishings
472	TIONWIDE EXPRESS COURIER SERVICES BHD [S]	Trading/Services	Delivery Services
473	NCB HOLDINGS BHD [S]	Trading/Services	Transport Services
474	NEGRI SEMBILAN OIL PALMS BHD [S]	Plantation	Farming & Fishing
475	NESTLE (M) BHD [S]	Consumer	Food Products
476	NEW HOONG FATT HOLDINGS BHD [S]	Consumer	Auto Parts
477	NGIU KEE CORPORATION (M) BHD [S]	Trading/Services	Broadline Retailers
478	NI HSIN RESOURCES BHD [S]	Consumer	Dur. Household Prod.
479	NICHE CAPITAL	Manufacture	Manufacture

480	NILAI RESOURCES GROUP BHD [S]	Property	Real Estate Hold, Dev
481	THE NOMAD GROUP BHD	Trading/Services	Real Estate Hold, Dev
482	NOTION VTEC BHD [S]	Technology	Industrial Machinery
483	NPC RESOURCES BHD [S]	Plantation	Farming & Fishing
484	NTPM HOLDINGS BHD [S]	Consumer	Persol Products
485	NV MULTI CORPORATION BHD	Consumer	Spec.Consumer Service
486	NWP HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
487	NYLEX (M) BHD [S]	Industrial Products	Commodity Chemicals
488	OCB BHD [S]	Trading/Services	Food Products
489	OCTAGON CONSOLIDATED BHD [S]	Industrial Products	Building Mat.& Fix.
490	OGAWA WORLD BHD [S]	Trading/Services	Medical Equipment
491	OKA CORPORATION BHD [S]	Industrial Products	Building Mat.& Fix.
492	OLYMPIA INDUSTRIES BHD	Trading/Services	Gambling
493	ORIENTAL FOOD INDUSTRIES HOLDINGS BHD [S]	Consumer	Food Products
494	ORIENTAL HOLDINGS BHD [S]	Consumer	Specialty Retailers
495	ORIENTAL INTEREST BHD [S]	Property	Real Estate Hold, Dev
496	ORPAPER BHD [S]	Industrial Products	Containers & Package
497	OSK PROPERTY HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
498	PA RESOURCES BHD [S]	Industrial Products	Aluminum
499	PADIBERAS SIOL BHD [S]	Consumer	Food Products
500	PADINI HOLDINGS BHD [S]	Consumer	Clothing & Accessory
501	PAHANCO CORPORATION BHD [S]	Industrial Products	Building Mat.& Fix.
502	PAN MALAYSIA CORPORATION BHD [S]	Consumer	Food Products
503	PAN MALAYSIA HOLDINGS BHD	Hotel	Travel & Tourism
504	PAN MALAYSIAN INDUSTRIES BHD	Trading/Services	Broadline Retailers
505	PASONIC MANUFACTURING MALAYSIA BHD [S]	Consumer	Dur. Household Prod.
506	PANSAR BHD [S]	Trading/Services	Building Mat.& Fix.
507	PANTECH GROUP HOLDINGS BHD [S]	Trading/Services	Iron & Steel
508	PAOS HOLDINGS BHD [S]	Industrial Products	Farming & Fishing
509	PARAGON UNION BHD [S]	Consumer	Furnishings
510	PARAMOUNT CORPORATION BHD	Property	Real Estate Hold, Dev
511	PARKSON HOLDINGS BHD [S]	Trading/Services	Broadline Retailers
512	PASDEC HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
513	PATIMAS COMPUTERS BHD [S]	Technology	Computer Services
514	PBA HOLDINGS BHD [S]	Trading/Services	Water
515	PCCS GROUP BHD [S]	Consumer	Clothing & Accessory
516	PDZ HOLDINGS BHD [S]	Trading/Services	Marine Transportation
517	PELANGI PUBLISHING GROUP BHD [S]	Industrial Products	Publishing
518	PELIKAN INTCORPORATION BHD [S]	Consumer	Nondur.Household Prod
519	PENSONIC HOLDINGS BHD [S]	Industrial Products	Dur. Household Prod.
520	PENTAMASTER CORPORATION BHD [S]	Technology	Industrial Machinery
521	PERAK CORPORATION BHD [S]	Trading/Services	Transport Services
522	PETRA PERDA BHD [S]	Trading/Services	Oil Equip. & Services
523	PERDUREN (M) BHD [S]	Property	Real Estate Hold, Dev

524	PERISAI PETROLEUM TEKNOLOGI BHD [S]	Industrial Products	Oil Equip. & Services
525	PERMAJU INDUSTRIES BHD [S]	Industrial Products	Forestry
526	PERUSAHAAN SADUR TIMAH M'SIA (PERSTIMA) BHD	Industrial Products	Nonferrous Metals
527	PERWAJA HOLDINGS BERHAD [S]	Industrial Products	Iron & Steel
528	PETALING TIN BHD [S]	Property	Real Estate Hold, Dev
529	PETRA ENERGY BHD [S]	Trading/Services	Oil Equip. & Services
530	PETROL ONE RESOURCES BHD [S]	Trading/Services	Industrial Machinery
531	PETROS CHEMICALS GROUP BHD [S]	Industrial Products	Specialty Chemicals
532	PETROS DAGANGAN BHD [S]	Trading/Services	Integrated Oil & Gas
533	PETROS GAS BHD [S]	Industrial Products	Exploration & Prod.
534	PFCE	Manufacture	Manufacture
535	PHARMANIAGA BHD [S]	Trading/Services	Pharmaceuticals
536	PIE INDUSTRIAL BHD [S]	Industrial Products	Electrical Equipment
537	BEST WORLD LAND BHD	Plantation	Plantation
538	PINTARAS JAYA BHD [S]	Construction	Heavy Construction
539	PJ DEVELOPMENT HOLDINGS BHD [S]	Property	Heavy Construction
540	PJBUMI BHD [S]	Trading/Services	Waste, Disposal Svs.
541	PJI HOLDINGS BHD [S]	Trading/Services	Heavy Construction
542	PLB ENGINEERING BHD [S]	Construction	Heavy Construction
543	PLENITUDE BHD [S]	Property	Real Estate Hold, Dev
544	PLS PLANTATIONS BHD [S]	Plantation	Farming & Fishing
545	PLUS EXPRESSWAYS BHD [S]	Trading/Services	Transport Services
546	PMB TECHNOLOGY BHD [S]	Industrial Products	Industrial Machinery
547	PNE PCB BHD [S]	Industrial Products	Electrical Equipment
548	POH HUAT RESOURCES HOLDINGS BHD [S]	Consumer	Furnishings
549	POH KONG HOLDINGS BHD [S]	Consumer	Specialty Retailers
550	POLY GLASS FIBRE (M) BHD [S]	Industrial Products	Commodity Chemicals
551	POS MALAYSIA BHD [S]	Trading/Services	Delivery Services
552	POWER ROOT BHD [S]	Consumer	Soft Drinks
553	PPB GROUP BHD [S]	Consumer	Food Products
554	PREMIER LFIN	Property	Property
555	PRESS METAL BHD [S]	Industrial Products	Aluminum
556	PRESTAR RESOURCES BHD [S]	Industrial Products	Industrial Machinery
557	PRICEWORTH INTERTIOL BHD [S]	Industrial Products	Building Mat.& Fix.
558	PRINSIPTEK CORPORATION BHD [S]	Construction	Heavy Construction
559	PROGRESSIVE IMPACT CORPORATION BHD [S]	Trading/Services	Waste, Disposal Svs.
560	PROLEXUS BHD [S]	Consumer	Clothing & Accessory
561	PROTASCO BHD [S]	Construction	Heavy Construction
562	PROTON HOLDINGS BHD [S]	Consumer	Automobiles
563	PUBLIC PACKAGES HOLDINGS BHD [S]	Industrial Products	Containers & Package
564	PULAI SPRINGS BHD	Trading/Services	Hotels
565	PUNCAK NIAGA HOLDINGS BHD [S]	Infrastructure Projects	Water
566	PW CONSOLIDATED BHD [S]	Consumer	Farming & Fishing
567	QL RESOURCES BHD [S]	Consumer	Farming & Fishing

568	QSR BRANDS BHD [S]	Trading/Services	Restaurants & Bars
569	QUALITY CONCRETE HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
570	RALCO CORPORATION BHD [S]	Industrial Products	Containers & Package
571	RAMUNIA HOLDINGS BHD [S]	Trading/Services	Oil Equip. & Services
572	RANHILL BHD [S]	Construction	Heavy Construction
573	RAPID SYNERGY BHD [S]	Industrial Products	Industrial Machinery
574	RELIANCE PACIFIC BHD	Trading/Services	Travel & Tourism
575	RESINTECH BHD [S]	Industrial Products	Building Mat.& Fix.
576	REX INDUSTRY BHD [S]	Consumer	Food Products
577	RGB INTERTIOL BHD	Trading/Services	Gambling
578	RIMBUN SAWIT BHD [S]	Plantation	Farming & Fishing
579	RIVERVIEW RUBBER ESTATES BHD [S]	Plantation	Farming & Fishing
580	ROCK CHEMICAL INDUSTRIES (M) BHD [S]	Industrial Products	Building Mat.& Fix.
581	RUBBEREX CORPORATION (M) BHD [S]	Industrial Products	Medical Supplies
582	SAAG CONSOLIDATED (M) BHD [S]	Trading/Services	Oil Equip. & Services
583	SALCON BHD [S]	Trading/Services	Water
584	SAM ENGINEERING & EQUIPMENT (M) BERHAD [S]	Technology	Industrial Machinery
585	SAMCHEM HOLDINGS BHD [S]	Trading/Services	Specialty Chemicals
586	SANBUMI HOLDINGS BHD [S]	Industrial Products	Forestry
587	SAPURA INDUSTRIAL BHD [S]	Industrial Products	Auto Parts
588	SAPURA RESOURCES BHD [S]	Property	Specialty Retailers
589	SAPURACREST PETROLEUM BHD [S]	Trading/Services	Oil Equip. & Services
590	SARAWAK CABLE BHD [S]	Industrial Products	Electrical Equipment
591	SARAWAK CONSOLIDATED INDUSTRIES BHD [S]	Industrial Products	Building Mat.& Fix.
592	SARAWAK OIL PALMS BHD [S]	Plantation	Farming & Fishing
593	SARAWAK PLANTATION BHD [S]	Plantation	Farming & Fishing
594	SBC CORPORATION BHD [S]	Construction	Real Estate Hold, Dev
595	SCANWOLF CORPORATION BHD [S]	Industrial Products	Industrial Machinery
596	SCGM BHD [S]	Industrial Products	Containers & Package
597	SCICOM (MSC) BHD [S]	Trading/Services	Business Support Svs.
598	SCIENTEX BHD [S]	Industrial Products	Containers & Package
599	SCOMI ENGINEERING BHD [S]	Industrial Products	Business Support Svs.
600	SCOMI GROUP BHD [S]	Industrial Products	Oil Equip. & Services
601	SCOMI MARINE BHD [S]	Trading/Services	Transport Services
602	SEACERA TILES BHD [S]	Industrial Products	Building Mat.& Fix.
603	SEAL INCORPORATED BHD [S]	Industrial Products	Real Estate Hold, Dev
604	SEALINK INTERTIOL BHD [S]	Industrial Products	Comm. Vehicles,Trucks
605	SEE HUP CONSOLIDATED BHD [S]	Trading/Services	Trucking
606	SEG INTERTIOL BHD [S]	Trading/Services	Spec.Consumer Service
607	SELANGOR DREDGING BHD [S]	Property	Real Estate Hold, Dev
608	SELANGOR PROPERTIES BHD [S]	Property	Real Estate Hold, Dev
609	SELOGA HOLDINGS BHD [S]	Construction	Heavy Construction
610	SENI JAYA CORPORATION BHD [S]	Trading/Services	Media Agencies
611	SEREMBAN ENGINEERING BHD [S]	Industrial Products	Industrial Machinery

612	SERN KOU RESOURCES BHD [S]	Consumer	Furnishings
613	SHANGRI-LA HOTELS (M) BHD	Hotel	Hotels
614	SHELL REFINING CO (FOM) BHD [S]	Industrial Products	Exploration & Prod.
615	SHH RESOURCES HOLDINGS BHD [S]	Consumer	Furnishings
616	SHIN YANG SHIPPING CORPORATION BHD [S]	Trading/Services	Marine Transportation
617	SHL CONSOLIDATED BHD [S]	Property	Real Estate Hold, Dev
618	SIG GASES BHD [S]	Industrial Products	Specialty Chemicals
619	SIGTURE INTERTIOL BHD [S]	Consumer	Furnishings
620	SILK HOLDINGS BHD [S]	Infrastructure Projects	Transport Services
621	SILVER BIRD GROUP BHD [S]	Consumer	Telecom. Equipment
622	SIME DARBY BHD [S]	Trading/Services	Divers. Industrials
623	SIN HENG CHAN (MALAYA) BHD [S]	Consumer	Farming & Fishing
624	SIRIA CORPORATION BHD [S]	Consumer	Specialty Fince
625	SINDORA BHD	Industrial Products	Specialty Fince
626	SINO HUA-AN INTERTIOL BHD [S]	Industrial Products	Coal
627	SINOTOP HOLDINGS BHD [S]	Consumer	Clothing & Accessory
628	SKB SHUTTERS CORPORATION BHD [S]	Industrial Products	Building Mat.& Fix.
629	SKP RESOURCES BHD [S]	Industrial Products	Specialty Chemicals
630	SLP RESOURCES BHD [S]	Industrial Products	Commodity Chemicals
631	SMIS CORPORATION BHD [S]	Industrial Products	Auto Parts
632	SMPC CORPORATION BHD [S]	Industrial Products	Iron & Steel
633	SOUTH MALAYSIA INDUSTRIES BHD [S]	Property	Real Estate Hold, Dev
634	SOUTHERN ACIDS (M) BHD [S]	Industrial Products	Specialty Chemicals
635	SOUTHERN STEEL BHD [S]	Industrial Products	Iron & Steel
636	SP SETIA BHD [S]	Property	Real Estate Hold, Dev
637	SPK-SENTOSA CORPORATION BHD [S]	Construction	Heavy Construction
638	SPRITZER BHD [S]	Consumer	Soft Drinks
639	STAMFORD COLLEGE BHD [S]	Trading/Services	Spec.Consumer Service
640	STAR PUBLICATIONS (M) BHD [S]	Trading/Services	Publishing
641	STONE MASTER CORPORATION BHD [S]	Industrial Products	Building Mat.& Fix.
642	SUBUR TIASA HOLDINGS BHD [S]	Industrial Products	Forestry
643	SUCCESS TRANSFORMER CORP BHD [S]	Industrial Products	Electrical Equipment
644	SUIWAH CORPORATION BHD [S]	Trading/Services	Broadline Retailers
645	SUMATEC RESOURCES BHD [S]	Trading/Services	Oil Equip. & Services
646	SUNCHIRIN INDUSTRIES (M) BHD [S]	Industrial Products	Auto Parts
647	SUNGEI BAGAN RUBBER CO (M) BHD	Plantation	Farming & Fishing
648	SUNWAY CITY BHD [S]	Property	Real Estate Hold, Dev
649	SUPER ENTERPRISE HOLDINGS BHD [S]	Industrial Products	Containers & Package
650	SUPERLON HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
651	SUPERMAX CORPORATION BHD [S]	Industrial Products	Medical Supplies
652	SUPPORTIVE INTERTIOL HOLDINGS BHD [S]	Industrial Products	Electrical Equipment
653	SURIA CAPITAL HOLDINGS BHD [S]	Trading/Services	Transport Services
654	SYCAL VENTURES BHD [S]	Construction	Heavy Construction
655	SYF RESOURCES BHD [S]	Consumer	Furnishings

656	SYMPHONY HOUSE BHD [S]	Trading/Services	Business Support Svs.
657	TA ANN HOLDINGS BHD [S]	Industrial Products	Forestry
658	TA GLOBAL BHD [S]	Property	Real Estate Hold, Dev
659	TA WIN HOLDINGS BHD [S]	Industrial Products	Electrical Equipment
660	TAFI INDUSTRIES BHD [S]	Consumer	Furnishings
661	TAHPS GROUP BHD [S]	Property	Real Estate Hold, Dev
662	TAKASO RESOURCES BHD	Consumer	Persol Products
663	TALIWORKS CORPORATION BHD [S]	Trading/Services	Water
664	TAN CHONG MOTOR HOLDINGS BHD [S]	Consumer	Automobiles
665	TANCO HOLDINGS BHD	Property	Real Estate Hold, Dev
666	TANJUNG OFFSHORE BHD [S]	Trading/Services	Oil Equip. & Services
667	TAS OFFSHORE BHD [S]	Industrial Products	Comm. Vehicles,Trucks
668	TASCO BHD [S]	Trading/Services	Transport Services
669	TASEK CORPORATION BHD [S]	Industrial Products	Building Mat.& Fix.
670	TATT GIAP GROUP BHD [S]	Industrial Products	Iron & Steel
671	TDM BHD [S]	Plantation	Farming & Fishing
672	TEBRAU TEGUH BHD [S]	Property	Heavy Construction
673	TECK GUAN PERDA BHD [S]	Consumer	Farming & Fishing
674	TECNIC GROUP BHD [S]	Industrial Products	Industrial Machinery
675	TEK SENG HOLDINGS BHD [S]	Consumer	Commodity Chemicals
676	TEKALA CORPORATION BHD [S]	Industrial Products	Forestry
677	TELEKOM MALAYSIA BHD [S]	Trading/Services	Fixed Line Telecom.
678	TEGA SIOL BHD [S]	Trading/Services	Alt. Electricity
679	TEO GUAN LEE CORPORATION BHD [S]	Consumer	Clothing & Accessory
680	TEO SENG CAPITAL BHD [S]	Consumer	Farming & Fishing
681	TEXCHEM RESOURCES BHD [S]	Trading/Services	Divers. Industrials
682	TH PLANTATIONS BHD [S]	Plantation	Farming & Fishing
683	THE STORE CORPORATION BHD [S]	Trading/Services	Broadline Retailers
684	THETA EDGE BHD [S]	Technology	Telecom. Equipment
685	THONG GUAN INDUSTRIES BHD [S]	Industrial Products	Containers & Package
686	THREE-A RESOURCES BHD [S]	Industrial Products	Food Products
687	TIEN WAH PRESS HOLDINGS BHD	Industrial Products	Business Support Svs.
688	TIGER SYNERGY BHD [S]	Industrial Products	Furnishings
689	TIMBERWELL BHD [S]	Industrial Products	Forestry
690	TIME DOTCOM BHD [S]	Infrastructure Projects	Fixed Line Telecom.
691	TIME ENGINEERING BHD [S]	Trading/Services	Computer Services
692	TIONG M LOGISTICS HOLDINGS BHD [S]	Trading/Services	Trucking
693	TMC LIFE SCIENCES BHD	Trading/Services	Healthcare Providers
694	TOMEI CONSOLIDATED BHD [S]	Consumer	Clothing & Accessory
695	TOMYPAK HOLDINGS BHD [S]	Industrial Products	Containers & Package
696	TONG HERR RESOURCES BHD [S]	Industrial Products	Iron & Steel
697	TOP GLOVE CORPORATION BHD [S]	Industrial Products	Medical Supplies
698	TOYO INK GROUP BHD [S]	Industrial Products	Specialty Chemicals
699	TPC PLUS BHD [S]	Consumer	Farming & Fishing

700	TRACOMA HOLDINGS BHD [S]	Industrial Products	Auto Parts
701	TRADEWINDS CORPORATION BHD	Trading/Services	Hotels
702	TRADEWINDS (M) BHD [S]	Consumer	Food Products
703	TRADEWINDS PLANTATION BHD [S]	Plantation	Farming & Fishing
704	TRANSOCEAN HOLDINGS BHD [S]	Trading/Services	Trucking
705	TRC SYNERGY BHD [S]	Construction	Heavy Construction
706	TRINITY CORPO	Customer Product	CustomerProduct
707	TRIPLC BHD [S]	Property	Heavy Construction
708	TRIUMPHAL ASSOCIATES BHD [S]	Trading/Services	Comm. Vehicles,Trucks
709	TSH RESOURCES BHD [S]	Plantation	Farming & Fishing
710	TSM GLOBAL BHD [S]	Trading/Services	Electrical Equipment
711	TSR CAPITAL BHD [S]	Construction	Heavy Construction
712	TURBO-MECH BHD [S]	Trading/Services	Industrial Machinery
713	TURIYA	Industrial Products	Semiconductors
714	UAC BHD [S]	Industrial Products	Building Mat.& Fix.
715	UCHI TECHNOLOGIES BHD [S]	Industrial Products	Electronic Equipment
716	UDS CAPITAL BHD [S]	Consumer	Furnishings
717	UEM LAND HOLDINGS BHD [S]	Property	Real Estate Hold, Dev
718	UMS HOLDINGS BHD [S]	Trading/Services	Electronic Equipment
719	UMS-NEIKEN GROUP BHD [S]	Industrial Products	Electrical Equipment
720	UMW HOLDINGS BHD [S]	Consumer	Automobiles
721	UNICO-DESA PLANTATIONS BHD	Plantation	Farming & Fishing
722	UNIMECH GROUP BHD [S]	Trading/Services	Industrial Machinery
723	UNISEM (M) BHD [S]	Technology	Semiconductors
724	UNITED BINTANG BHD [S]	Industrial Products	Comm. Vehicles,Trucks
725	UNITED MALACCA BHD [S]	Plantation	Farming & Fishing
726	UNITED MALAYAN LAND BHD [S]	Property	Real Estate Hold, Dev
727	UNITED PLANTATIONS BHD [S]	Plantation	Farming & Fishing
728	UNITED U-LI CORPORATION BHD [S]	Industrial Products	Building Mat.& Fix.
729	UPA CORPORATION BHD [S]	Consumer	Containers & Package
730	UTUSAN MELAYU (M) BHD [S]	Trading/Services	Publishing
731	UZMA BHD [S]	Trading/Services	Oil Equip. & Services
732	VASTALUX ENERGY BERHAD [S]	Trading/Services	Oil Equip. & Services
733	VERSATILE CREATIVE BHD [S]	Industrial Products	Containers & Package
734	VITROX CORPORATION BHD [S]	Technology	Semiconductors
735	VOIR HOLDINGS BHD	Trading/Services	Clothing & Accessory
736	VS INDUSTRY BHD [S]	Industrial Products	Electronic Equipment
737	VTI VINTAGE BHD [S]	Industrial Products	Building Mat.& Fix.
738	WAH SEONG CORPORATION BHD [S]	Industrial Products	Oil Equip. & Services
739	WANG-ZHENG BHD [S]	Consumer	Persol Products
740	WARISAN TC HOLDINGS BHD [S]	Trading/Services	Travel & Tourism
741	WATTA HOLDING BHD [S]	Industrial Products	Auto Parts
742	WAWASAN TKH HOLDINGS BHD [S]	Industrial Products	Containers & Package
743	WCT BHD [S]	Construction	Heavy Construction

744	WEIDA (M) BHD [S]	Industrial Products	Industrial Machinery
745	WELLCALL HOLDINGS BHD [S]	Industrial Products	Industrial Machinery
746	WHITE HORSE BHD [S]	Industrial Products	Building Mat.& Fix.
747	WIDETECH (M) BHD	Trading/Services	Dur. Household Prod.
748	WIJAYA BARU GLOBAL BHD [S]	Industrial Products	Forestry
749	WILLOWGLEN MSC BHD [S]	Technology	Software
750	WING TAI MALAYSIA BHD [S]	Property	Clothing & Accessory
751	WONG ENGINEERING CORPORATION BHD [S]	Industrial Products	Industrial Machinery
752	WOODLANDOR HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
753	WTK HOLDINGS BHD [S]	Industrial Products	Building Mat.& Fix.
754	WZ STEEL BHD [S]	Industrial Products	Iron & Steel
755	XIAN LENG HOLDINGS BHD [S]	Consumer	Farming & Fishing
756	XIDELANG HOLDINGS LTD [S]	Consumer	Footwear
757	XINQUAN INTERTIOL SPORTS HOLDINGS LTD [S]	Consumer	Footwear
758	Y&G CORP BHD [S]	Property	Real Estate Hold, Dev
759	YA HORNG ELECTRONIC (M) BHD [S]	Industrial Products	Consumer Electronics
760	YEE LEE CORPORATION BHD [S]	Consumer	Food Products
761	YEN GLOBAL BHD [S]	Consumer	Clothing & Accessory
762	YEO HIAP SENG (M) BHD [S]	Consumer	Food Products
763	YI-LAI BHD [S]	Industrial Products	Building Mat.& Fix.
764	YINSON HOLDINGS BHD [S]	Trading/Services	Industrial Suppliers
765	YLI HOLDINGS BHD [S]	Industrial Products	Industrial Machinery
766	YNH PROPERTY BHD [S]	Property	Real Estate Hold, Dev
767	YOKOHAMA INDUSTRIES BHD [S]	Industrial Products	Auto Parts
768	YONG TAI BHD [S]	Consumer	Clothing & Accessory
769	YOONG ONN CORPORATION BHD [S]	Consumer	Dur. Household Prod.
770	YSPSOUTHEAST ASIA HOLDING BHD [S]	Consumer	Pharmaceuticals
771	YTL CORPORATION BHD [S]	Construction	Multiutilities
772	YTL CEMENT BHD [S]	Industrial Products	Building Mat.& Fix.
773	YTL LAND & DEVELOPMENT BHD [S]	Property	Real Estate Hold, Dev
774	YTL POWER INTERTIOL BHD [S]	Infrastructure Projects	Water
775	YUNG KONG GALVANISING INDUSTRIES BHD [S]	Industrial Products	Iron & Steel
776	ZECON BHD [S]	Construction	Heavy Construction
777	ZELAN BHD [S]	Construction	Heavy Construction
778	ZHULIAN CORPORATION BHD [S	Consumer	Clothing & Accessory

Utility companies in Malaysia

COMPANIES	INDUSTRIES
ALIRAN IHSAN RESOURCES BHD	Water
BREM HOLDINGS BHD	Heavy Construction
EDEN INC BHD	Con. Electricity
KENCA PETROLEUM BHD	Oil Equip. & Services
KUMPULAN PERANGSANG SELANGOR BHD	Water
MEGA FIRST CORPORATION BHD	Con. Electricity
MMC CORPORATION BHD	Multi utilities
PBA HOLDINGS BHD	Water
PERWAJA HOLDINGS BERHAD	Iron & Steel
PETROS GAS BHD	Exploration & Prod.
PLUS EXPRESSWAYS BHD	Transport Services
POS MALAYSIA BHD	Delivery Services
PUNCAK NIAGA HOLDINGS BHD	Water
RANHILL BHD	Heavy Construction
SALCON BHD	Water
TALIWORKS CORPORATION BHD	Water
TELEKOM MALAYSIA BHD	Fixed Line Telecom.
TEGA SIOL BHD	Alt. Electricity
YTL CORPORATION BHD	Multi utilities
YTL POWER INTERTIOL BHD	Water

Descriptive Statistic for all samples

	LEV	DM	GROW	SIZE	NOL	REGUL	ABNR	ROA	TANG	ASMAT	SPREAD
Mean	0.2640	0.3890	1.0666	12.7792	0.2381	0.0295	0.1134	3.9408	0.4063	36.4067	1.5143
Median	0.2357	0.3453	0.9090	12.5658	0.0000	0.0000	0.0269	4.0800	0.3976	13.3563	1.2940
Maximum	10.2731	1.0000	19.1016	18.4518	1.0000	1.0000	110.9639	771.4500	0.9875	3352.3540	4.0550
Minimum	0.0000	0.0000	0.2372	7.7098	0.0000	0.0000	-369.0370	-93.4700	0.0000	-2142.2590	0.0390
Std. Dev.	0.2872	0.3130	0.7579	1.3385	0.4259	0.1693	5.5641	14.0380	0.2069	112.9911	0.9313
Skewness	15.5036	0.3439	8.5740	0.8428	1.2300	5.5572	-47.4478	28.7859	0.2460	10.0557	0.2757
Kurtosis	478.0753	1.8230	132.1960	3.8473	2.5129	31.8825	3453.1310	1574.1810	2.5781	249.5762	2.2106
Jarque-Bera	54029598	443	4048956	848	1499	228299	2840000000	589000000	100	14589567	221
Observations	5721	5721	5721	5721	5721	5721	5721	5721	5721	5721	5721

Correlation Matrix for Leverage Equation

Included observations: 5806

Correlation t-Statistic Probability	LEV	DM	GROW	SIZE	NOL	REGUL	ABNR	ROA	TANG
LEV	1.000000								

DM	0.039243	1.000000							
	2.991971	-----							
	0.0028	-----							
GROW	0.356187	0.045219	1.000000						
	29.04039	3.448527	-----						
	0.0000	0.0006	-----						
SIZE	0.026095	0.361400	-0.015356	1.000000					
	1.988712	29.52869	-1.169998	-----					
	0.0468	0.0000	0.2420	-----					
NOL	0.181352	-0.067269	-0.004683	-0.165170	1.000000				
	14.04910	-5.136420	-0.356751	-12.75853	-----				
	0.0000	0.0000	0.7213	0.0000	-----				
REGUL	0.038785	0.203618	0.039339	0.290018	-0.042099	1.000000			
	2.957023	15.84438	2.999326	23.08696	-3.210138	-----			
	0.0031	0.0000	0.0027	0.0000	0.0013	-----			
ABNR	0.116511	-0.002854	0.078713	-0.009575	0.012737	0.003430	1.000000		
	8.937140	-0.217449	6.015344	-0.729472	0.970461	0.261301	-----		
	0.0000	0.8279	0.0000	0.4657	0.3319	0.7939	-----		
ROA	-0.202144	0.060867	0.132870	0.081304	-0.206409	0.025192	-0.008270	1.000000	
	-15.72478	4.645681	10.21310	6.214667	-16.07115	1.919825	-0.630061	-----	
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0549	0.5287	-----	
TANG	0.060664	0.181180	-0.074299	0.069257	0.004005	0.032543	0.006011	-0.056476	1.000000
	4.630145	14.03527	-5.676115	5.288957	0.305153	2.480595	0.457981	-4.309408	-----
	0.0000	0.0000	0.0000	0.0000	0.7603	0.0131	0.6470	0.0000	-----

Correlation Matrix for Debt Maturity Equation

Included observations: 6024

Correlation t-Statistic Probability	DM	LEV	GROW	SIZE	NOL	REGUL	ABNR	ASMAT	SPREAD
DM	1.000000 ----- -----								
LEV	0.040431 3.140048 0.0017	1.000000 ----- -----							
GROW	0.039192 3.043694 0.0023	0.340960 28.14558 0.0000	1.000000 ----- -----						
SIZE	0.365160 30.43895 0.0000	0.032255 2.504353 0.0123	-0.027994 -2.173201 0.0298	1.000000 ----- -----					
NOL	-0.052354 -4.068297 0.0000	0.180425 14.23484 0.0000	-0.012220 -0.948354 0.3430	-0.140130 -10.98266 0.0000	1.000000 ----- -----				
REGUL	0.205058 16.25830 0.0000	0.041100 3.192087 0.0014	0.034829 2.704456 0.0069	0.293076 23.78766 0.0000	-0.039629 -3.077712 0.0021	1.000000 ----- -----			
ABNR	0.008876 0.688852 0.4909	0.109259 8.529724 0.0000	0.067153 5.222988 0.0000	-0.001563 -0.121264 0.9035	0.006524 0.506275 0.6127	0.001709 0.132614 0.8945	1.000000 ----- -----		
ASMAT	0.127511 9.976523 0.0000	-0.011923 -0.925325 0.3548	-0.069276 -5.388846 0.0000	0.087987 6.854542 0.0000	0.042940 3.335252 0.0009	-0.028097 -2.181199 0.0292	0.253214 20.31173 0.0000	1.000000 ----- -----	
SPREAD	-0.032813 -2.547715 0.0109	-0.000393 -0.030486 0.9757	0.067048 5.214739 0.0000	0.000575 0.044631 0.9644	-0.013010 -1.009716 0.3127	0.004955 0.384518 0.7006	-0.015151 -1.175892 0.2397	-0.019781 -1.535362 0.1247	1.000000 ----- -----

Multicollinearity Test for Leverage Equation

Variance Inflation Factors
Date: 12/11/11 Time: 23:50
Sample: 1 9336
Included observations: 5806

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DM	0.000135	3.068505	1.204646
GROW	2.00E-05	3.109289	1.035966
SIZE	7.62E-06	114.5962	1.250687
NOL	6.44E-05	1.407520	1.069822
REGUL	0.000430	1.140481	1.107284
ABNR	3.62E-07	1.007300	1.006887
ROA	6.02E-08	1.154851	1.071107
TANG	0.000265	5.043870	1.045084
C	0.001257	114.5186	NA

Multicollinearity Test for Debt Maturity Equation

Variance Inflation Factors
Date: 12/11/11 Time: 23:53
Sample: 1 9336
Included observations: 6024

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LEV	0.000202	2.215211	1.195531
GROW	2.77E-05	3.508585	1.155939
SIZE	8.70E-06	104.6177	1.134588
NOL	8.33E-05	1.381580	1.068982
REGUL	0.000529	1.133040	1.099937
ABNR	3.83E-07	1.088739	1.087948
ASMAT	1.22E-09	1.208451	1.093354
SPREAD	1.53E-05	3.732514	1.005626
C	0.001498	109.7362	NA

Single Equation for Leverage Equation without Endogenous Variables

Dependent Variable: LEV
Method: Panel EGLS (Cross-section weights)
Date: 12/02/11 Time: 23:29
Sample (adjusted): 2000 2010
Periods included: 11
Cross-sections included: 739
Total panel (unbalanced) observations: 5607
Iterate coefficients after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)
Convergence achieved after 19 total coef iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GROW	0.022539	0.003521	6.401329	0.0000
ROA	-0.002598	0.000157	-16.52957	0.0000
TANG	0.074801	0.018568	4.028438	0.0001
SIZE	0.044601	0.002852	15.63982	0.0000
NOL	0.014183	0.003346	4.238612	0.0000
REGUL	-0.073165	0.035980	-2.033499	0.0420
ABNR	-0.000109	2.51E-06	-43.39685	0.0000
C	-0.433142	0.047585	-9.102493	0.0000
AR(1)	0.897186	0.008464	106.0028	0.0000

Weighted Statistics

R-squared	0.854446	Mean dependent var	0.579701
Adjusted R-squared	0.854238	S.D. dependent var	0.495079
S.E. of regression	0.162394	Sum squared resid	147.6288
F-statistic	4107.749	Durbin-Watson stat	1.910288
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.435565	Mean dependent var	0.239269
Sum squared resid	259.7048	Durbin-Watson stat	2.201155

Inverted AR Roots .90

Single Equation for Debt Maturity Equation without Endogenous Variables

Dependent Variable: DM
Method: Panel EGLS (Cross-section weights)
Date: 12/02/11 Time: 23:24
Sample (adjusted): 2000 2010
Periods included: 11
Cross-sections included: 701
Total panel (unbalanced) observations: 5209
Iterate coefficients after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)
Convergence achieved after 9 total coef iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GROW	-0.001974	0.001489	-1.325506	0.1851
ASMAT	7.86E-05	4.17E-05	1.883259	0.0597
SPREAD	0.000342	0.002239	0.152795	0.8786
SIZE	0.091918	0.007749	11.86155	0.0000
NOL	-0.006041	0.004022	-1.502073	0.1331
REGUL	0.216965	0.045192	4.800929	0.0000
ABNR	-0.000908	0.000274	-3.316152	0.0009
C	-0.864502	0.096857	-8.925583	0.0000
AR(1)	0.794099	0.009047	87.77328	0.0000

Weighted Statistics

R-squared	0.898438	Mean dependent var	0.519993
Adjusted R-squared	0.898282	S.D. dependent var	1.600908
S.E. of regression	0.201173	Sum squared resid	210.4473
F-statistic	5750.028	Durbin-Watson stat	2.122554
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.539541	Mean dependent var	0.388493
Sum squared resid	231.2610	Durbin-Watson stat	2.273798

Inverted AR Roots	.79

Single Equation for Leverage Equation with Endogenous Variables

Dependent Variable: LEV
Method: Panel EGLS (Cross-section weights)
Date: 12/02/11 Time: 23:32
Sample (adjusted): 2000 2010
Periods included: 11
Cross-sections included: 705
Total panel (unbalanced) observations: 4988
Iterate coefficients after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)
Convergence achieved after 19 total coef iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DM	0.018646	0.006539	2.851381	0.0044
GROW	0.038316	0.005388	7.110891	0.0000
ROA	-0.002753	0.000167	-16.47093	0.0000
TANG	0.064707	0.015066	4.294883	0.0000
SIZE	0.034262	0.002782	12.31575	0.0000
NOL	0.011695	0.003002	3.896298	0.0001
REGUL	-0.069769	0.031781	-2.195272	0.0282
ABNR	0.001822	0.001094	1.665981	0.0958
C	-0.279362	0.045197	-6.181008	0.0000
AR(1)	0.887754	0.008412	105.5387	0.0000

Weighted Statistics

R-squared	0.845806	Mean dependent var	0.507910
Adjusted R-squared	0.845528	S.D. dependent var	0.392947
S.E. of regression	0.129010	Sum squared resid	82.85213
F-statistic	3034.008	Durbin-Watson stat	1.913673
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.553654	Mean dependent var	0.265650
Sum squared resid	149.4967	Durbin-Watson stat	2.335583

Inverted AR Roots	.89

Single Equation for Debt Maturity Equation with Endogenous Variables

Dependent Variable: DM
Method: Panel EGLS (Cross-section weights)
Date: 12/02/11 Time: 23:35
Sample (adjusted): 2000 2010
Periods included: 11
Cross-sections included: 701
Total panel (unbalanced) observations: 5209
Iterate coefficients after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)
Convergence achieved after 10 total coef iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEV	0.054711	0.012313	4.443446	0.0000
GROW	-0.002608	0.003014	-0.865310	0.3869
ASMAT	8.55E-05	3.65E-05	2.345582	0.0190
SPREAD	0.000600	0.002183	0.275033	0.7833
SIZE	0.095900	0.009727	9.859228	0.0000
NOL	-0.006832	0.004117	-1.659491	0.0971
REGUL	0.189633	0.051198	3.703880	0.0002
ABNR	-0.001122	0.000248	-4.519194	0.0000
C	-0.926696	0.122018	-7.594751	0.0000
AR(1)	0.797984	0.008356	95.50116	0.0000

Weighted Statistics

R-squared	0.806355	Mean dependent var	0.500648
Adjusted R-squared	0.806020	S.D. dependent var	0.501310
S.E. of regression	0.200940	Sum squared resid	209.9201
F-statistic	2405.455	Durbin-Watson stat	2.133718
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.539184	Mean dependent var	0.388493
Sum squared resid	231.4403	Durbin-Watson stat	2.285067

Inverted AR Roots	.80

2SLS Regression for Leverage Equation

Dependent Variable: LEV
Method: Panel Two-Stage EGLS (Cross-section weights)
Date: 12/01/11 Time: 15:46
Sample (adjusted): 2000 2010
Periods included: 11
Cross-sections included: 694
Total panel (unbalanced) observations: 4919
Iterate coefficients after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)
Convergence achieved after 15 total coef iterations
Instrument specification: C GROW ROA TANG SIZE NOL REGUL ABNR ASMAT SPREAD
Constant added to instrument list
Lagged dependent variable & regressors added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DM	-2.105514	0.321601	-6.546974	0.0000
GROW	0.137429	0.018219	7.543382	0.0000
ROA	-0.001104	0.000553	-1.998408	0.0457
TANG	0.557287	0.109947	5.068698	0.0000
SIZE	0.194254	0.033813	5.744934	0.0000
NOL	-0.003389	0.010336	-0.327848	0.7430
REGUL	0.498531	0.123570	4.034386	0.0001
ABNR	-0.000146	0.000813	-0.179771	0.8573
C	-1.869193	0.385981	-4.842711	0.0000
AR(1)	0.773398	0.009847	78.54133	0.0000

Weighted Statistics

R-squared	0.172945	Mean dependent var	0.440536
Adjusted R-squared	0.171429	S.D. dependent var	0.651117
S.E. of regression	0.462057	Sum squared resid	1048.055
F-statistic	6563.553	Durbin-Watson stat	2.049293
Prob(F-statistic)	0.000000	Second-Stage SSR	97.22819
Instrument rank	18		

Unweighted Statistics

R-squared	-2.283496	Mean dependent var	0.265979
Sum squared resid	1095.474	Durbin-Watson stat	2.211462

Inverted AR Roots .77

2SLS Regression for Debt Maturity Equation

Dependent Variable: DM
Method: Panel Two-Stage EGLS (Cross-section weights)
Date: 12/01/11 Time: 15:53
Sample (adjusted): 2000 2010
Periods included: 11
Cross-sections included: 701
Total panel (unbalanced) observations: 5200
Iterate coefficients after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)
Convergence achieved after 10 total coef iterations
Instrument specification: C GROW ROA TANG SIZE NOL REGUL ABNR ASMAT SPREAD
Constant added to instrument list
Lagged dependent variable & regressors added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEV	-0.114502	0.057043	-2.007275	0.0448
GROW	0.005569	0.004985	1.117148	0.2640
ASMAT	9.58E-05	4.31E-05	2.225232	0.0261
SPREAD	-0.001884	0.001814	-1.038170	0.2992
SIZE	0.097369	0.007756	12.55408	0.0000
NOL	-0.002930	0.003696	-0.792797	0.4279
REGUL	0.223022	0.051718	4.312275	0.0000
ABNR	-0.001310	0.000294	-4.455537	0.0000
C	-0.910690	0.108124	-8.422609	0.0000
AR(1)	0.776780	0.006994	111.0671	0.0000

Weighted Statistics

R-squared	0.910871	Mean dependent var	0.518256
Adjusted R-squared	0.910717	S.D. dependent var	1.383403
S.E. of regression	0.202921	Sum squared resid	213.7092
F-statistic	5956.185	Durbin-Watson stat	2.070657
Prob(F-statistic)	0.000000	Second-Stage SSR	211.6543
Instrument rank	18		

Unweighted Statistics

R-squared	0.535151	Mean dependent var	0.388489
Sum squared resid	233.1573	Durbin-Watson stat	2.241958

Inverted AR Roots .78