THE DETERMINANTS OF CAPITAL STRUCTURE OF GOVERNMENT LINKED COMPANIES IN MALAYSIA

EDDIE TAN KAH KENG
ONG GUEY WEN
SIA LEE LI
TEO YUEN LING
WONG ANNE YENG

BACHELOR OF FINANCE (HONS)

UNIVERSITI TUNKU ABDUL RAHMAN

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AUGUST 2016

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BY

EDDIE TAN KAH KENG
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A research project submitted in partial fulfillment of the
requirement for the degree of

BACHELOR OF FINANCE (HONS)

UNIVERSITI TUNKU ABDUL RAHMAN

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is _____15634_____.

Name of Students:	Student ID:	Signature:
1. Eddie Tan Kah Keng	13ABB08171	_____
2. Ong Guey Wen	13ABB07398	_____
3. Sia Lee Li	13ABB07254	_____
4. Teo Yuen Ling	13ABB07579	_____
5. Wong Anne Yeng	13ABB07193	_____

Date: _____20 August 2016_____

ACKNOWLEDGEMENTS

First of all, we would like to express our greatest gratitude and thank our final year project supervisor, Ms Kuah Yoke Chin for her valuable assistance and advices. Ms. Kuah had sacrifice her valuable time to assist and guide us so we can perform our best in this research project. Other than that, she also motivates and encourages us when we face some difficulties from beginning until the end of this research project.

Next, we would like to thank Universiti Tunku Abdul Rahman (UTAR) for giving us the opportunity to conduct this research project. We also want to thank the authority of Universiti Tunku Abdul Rahman (UTAR) for providing us the good environment and facilities to complete this research. Besides, it provides a completed research database in library in order to provide us useful information to contribute in our research project.

In addition, the group members of this project played important and significant role as well. This research would not be success and complete without their effort, cooperation, sacrifice in mentally and physically and support between each other in completing the research project.

Last but not least, we also appreciate the supports and helps given by our families and friends during the period of completing this research project. Their love and care had help us a lot to complete this research project. Thank you for all of your effort.

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LIST OF ABBREVIATIONS

AT	Agency Theory
BPLM	Breusch-Pagan Lagrange Multiple
CLT	Central Limit Theorem
CNLRM	Classical Normal Linear Regression Model
DBT	Debt Ratio
EPF	Employees Provident Fund
EViews	Electronic view
FEM	Fixed Effects Model
GLC	Government-Linked Companies
GLCT	Government-Linked Companies Transformation
GLIC	Government-Linked Investment Companies
JB	Jarque-Bera
KWSP	Pension Fund
LIQ	Liquidity
LM	Lagrange Multiple
LTAT	Armed Forces Fund
LTH	Pilgrims Fund
M&M	Modigliani and Miller
MOF	Ministry of Finance
OLS	Ordinary Least Square
PCG	Putrajaya Committee Government
PNB	Permodalan Nasional Berhad

POT   Pecking Trade Theory

PRO   Profitability

REM   Random Effect Model

ROA   Return of Asset

SOE   State Owned Enterprise

SZE   Firm Size

TAN   Tangibility

TOL   Tolerance

TOT   Trade off Theory

VIF   Variance Inflation Factor

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PREFACE

This research study is completed as a part of the requirement to fulfill the Bachelor of Finance (Hons) programme. The research topic is "The determinants of capital structure of Government Linked Companies (GLCs) in Malaysia". Overall research will discuss about what is the characteristic of the firm that can affect the debt level of GLCs in Malaysia.

Different business entity will adopt different optimal capital structure. The management in company's capital structure has been highlighted and kept in track in daily business operation. It is not only can be used to achieve the goal of the company, which is to maximize the value of company and profit earning, it is also vital for management decision making. When managers are able to determine the elements that affect the company's capital structure, they can react quickly and do an adjustment on the capital structure to reduce the risks of financial distress and bankruptcy.

There is always existence for the comparison between performance of GLCs and private sector. Through this research, reader will be able to understand the relationship between the capital structure and the determinants of GLCs in Malaysia.

ABSTRACT

The study of capital structure seeks to interpret the mix of securities and financing sources utilized by corporations to finance real investment. At this case, firms must select the best financing sources to attain the optimal capital structure to be in harmony which in line with firms' requirements in order to take appropriate financing decision. Government-linked companies play a significant role in the economic development of Malaysia. The objective of this study is to explore the determinants of capital structure of 30 government-linked companies (GLCs) listed on Bursa Malaysia Stock Exchange from 2010 to 2015. This research project uses capital structure measure including firm size, liquidity, profitability and tangibility as independent variable. Debt is the dependent variable. The firm's capital structure was analyzed by using secondary data gathered from the firms' annual report. Panel data approach was applied to test the hypothesized relationship and the result indicated that firm size and liquidity have significant inverse relationship with debt. This study also finds that there is insignificant negative association between profitability and debt. However, asset tangibility has insignificant positive relationship with the leverage of GLCs. This paper paves the way for future research related to ownership and capital structure of Malaysian GLCs.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

This research is aimed to investigate and analyze the factors that might influence the capital structure of government-linked companies (GLCs) in Malaysia. In this research, there are few factors which include firm size, liquidity, profitability and tangibility of the companies are considered. This chapter covers introduction, research background, problem statement, research objectives, research questions, hypothesis that are to be tested, significant of this study and chapter layout.

1.0.1 Capital Structure

Capital structure denotes the proportion of the various sources of long-term financing and is a part of financial structure. It is concerned with making the array of the sources of the funds in a proper manner, which is in relative proportion and magnitude. The research of capital structure seeks to interpret the combination of financing sources and securities utilized by companies to fund real investment. Financing sources are categorized into two sources, the internal financing which consists of retained earnings, common stock issuance, preferred stocks and reserves. Another source named external financing which involves bonds issuance, short term and long term loans. At this case, firms must select the best funding sources to attain the optimal capital structure to be in accordance with firm's requirements to take appropriate financing decision and then reflect positively on their performance (Soumadi & Hayajneh, 2012). There is no generic theory for the debt-equity choice and no good judgment to presume one or any (Myers, 1984).

This research of capital structure has pinpointed the portions of debt versus equity that taken down on the right sides of statement of financial position. A leveraged firm symbolizes a firm with greater amount of debt. Therefore, the deeply leveraged firm faces more risk as contrasted to firms with reduced debt. Additionally, a wrong judgment in financing may give rise to liquidation, financial distress, or bankruptcy. Whenever firms are unable to repay debt, firms will suffer from financial risks (Pandey, 2001). Hence, in order to reduce cost, highly levered firms have to apportion a systematic selection of debt and equity for the capital of the firm. Financial managers would have to maximize shareholders' wealth and minimize financial costs by determining the desirable debt-to-equity ratio. The purpose of this action is to mitigate stress on the firm's financing in the long run. By choosing the proper amount of borrowing, it would be important to realize whether revision of debt-equity ratio would enhance the wealth of shareholders. Also, capital structure is crucial and vital to the management of a firm financially because it provides further insights of risk to a firm.

1.0.2 Government-Linked Companies (GLCs)

This research examines the determinants of Malaysian government-linked companies (GLCs), which represent 36 percent of the market capital in the Malaysian stock market, perform an important part in the economic growth of the nation. In general the performance of key players has contaminated the public recognition of GLCs, despite the importance of them in Malaysia (Lau & Tong, 2008). For example, at the year ended September 2005, losses of Malaysia Airline System's (MAS) soared to RM648 million even though restructuring was attempted to return the airline to financial well-being. On the other hand, when Volkswagen dropped plans in year 2006 to invest in Proton Holding, the national carmaker, the company's share price fell sharply.

In the third quarter of the same year, the carmaker faced a loss before tax of RM240.5 million.

According to Lau and Tong (2008), GLCs are administered by the Malaysian government via the Federal Government-Linked Investment Companies (GLICs). GLICs are investment divisions from the government that distribute government assets to the GLCs. The Malaysian government on top of possessing ownership in GLCs, they also have an authority in the nomination of members of the board of directors and senior management level of positions. The government also has a controlling power in making crucial decisions, such as acquisition and divestments, restructuring and financing, etc.

1.1 Research Background

1.1.1 Origin of Capital Structure

According to Pandey (2001), 'capital structure of a company refers to the constitution of its capitalization and it consists of all longstanding capital resources such as shares, bonds, loans and reserves. Myers (1984) described capital structure as, 'adjusting the collection of funds resources in a right way or in comparative proportions. In the words of Chandra (2011), 'capital structure is virtually deal with how the firm determines to divide its cash flows into two broad components, which is a fixed component that is reserved to meet the obligations toward debt financing and a residual component that belongs to common shareholders'. Thus capital structure indicates the composition of funds raised from various sources widely classified as debt and equity. It may be construed as the portion of debt and equity in the capital that will remain invested in a business over a period of time.

The prevalence of the studies on capital structure generally focuses on the interpretation of particular firm attributes as determinants of leverage. Other than that, capital structure may modify across time (Salim & Yadav, 2012), although repeatedly converging on rather stable capital structures, which proposes the existence of an optimal level of leverage. Since Modigliani and Miller's (1958) irrelevance prepositions, the evolution of many theoretical points of view has been witnessed in this field (Kayo & Kimura, 2011). M&M irrelevance preposition justified that either the firm is financed through issuing debt or equity securities, or a mixture of two, there is no any impact to the value of a firm.

Nevertheless, to date, no theory can fully account for the formulation of optimal capital structure. Myers (2001) further added that "each factor could be prevailing in some circumstances or in some firms, yet unimportant elsewhere". In support, Deesomsak, Paudyal and Pescetto (2004) demonstrate that capital structure is not merely based on the firm specific factors but also the environment in which the firms are operating. Every company engages in its own set of unique environmental contingencies because no companies are completely similar, as a result there are different levels of environmental uncertainties (Lewis & Jais, 2013). By the way, the issue of certain capital structure that may heighten the shareholder value is one of the most important arguments in the finance arena, both empirically and theoretically.

1.1.2 Capital Structure in Malaysia

Determinants of capital structure were executed by past researchers under many criteria, take into consideration of differing determinants along with differing sectors in other country. Different countries have unique characteristics that control the firm's activities (Jamal, Geetha, Mohidin, Karim, Sang & Ch'ng, 2013). There are only a small number of researches

have been done on determinants of Malaysian capital structure along with only few sectors covered. For example, Pandey (2001) found a concave association between capital structure and profitability in Malaysia, owing to costs of external financing, agency costs and interest.

Results showed that Malaysian firms have exceptional characteristics from the research carried out by Lucey and Zhang (2011). Nevertheless, results from the research cannot be regarded as the characteristics of Malaysian firms because the sample size of the research was too small. In addition, research on capital structure conducted by Pratomo and Ismail (2006) concentrating only in the performance of Islamic banks. Furthermore, researchers Hadi, Yusoff and Yap (2015) identified that firms in the property sector generally rely on external financing for their investment activities. Besides that, the research that was conducted by Mansor and Zakaria (2007) was also confined to the construction and property sectors only. While in the industrial product sector of Malaysia, Ramli and Affandi (2015) emphasized that there is sufficient evident to reveal the relationship between the elements affecting the decisions of capital structure of Malaysian firms. Since firms in different sectors have different characteristics, it can be concluded that capital structure decisions therefore cannot represent the overall capital structure of the firms in Malaysia.

Prior to 1997 financial crisis, Malaysian firms were recognized to be highly levered viewing their close relationship with local banking and financial institutions where bank borrowings were ruling the capital structure of these firms (Nadaraja, Zulkafli & Masron, 2011). Therefore, capital structure of most Malaysian firms was more aligned to debt financing as options of equity financing were much less considered. This showed owner of the firms were making investment decision based on connections and links with the banks (Mohamad & Said, 2011). This refers to weak path among Malaysian firms in corporate governance practices, and contributed to bad corporate investment decisions, rapid diversification and risky financing practices. For example, in

November 1997, United Engineers Malaysia (a government-linked company) acquired 32.6% of its financially troubled holding company, Renong, at a premium price that was deemed as an act of bailout which implies weak corporate governance practices.

1.1.3 Government-Linked Companies (GLCs) in Malaysia

In 1983, the privatization master plan had been enforced, led to the setup of "Malaysia Incorporated". Its vision was to cut down the size of the public sector, and to enhance the firms' productivity and efficiency. It also involves the transfer of former state-owned-enterprises (SOEs) to private ownership and engages in profit-oriented business concerns. As private transfers are negligible and ownership is in the hand of state, these firms are widely known as government-linked companies. Via the Ministry of Finance (MOF) Inc., the creation of GLCs was made at the federal government level. MOF invested via its government-linked investment companies (GLICs), specifically the government giant investment arm, namely Employees Provident Fund (EPF), Pension Fund (KWAP), the Armed Forces Fund (LTAT), Pilgrims Fund (LTH), Khazanah Nasional Bhd (Khazanah), and the Permodalan Nasional Bhd (PNB). These stated institutional investors either control the GLCs or directly hold ownership (PCG, 2006).

Putrajaya Committee originates the GLC Transformation Manual on GLC High Performance, GLCs are defined as "corporations that the federal government has direct controlling stake in along with commercial interest". This involves the government's ability to make major decisions for GLCs and nominate members of the Board of Directors and top management through its owned GLICs, either directly or indirectly. GLCs have its share of less than excellent performance since the Asian financial crisis in 1997 and have been subjected to political investigation and public debate. Both financially and

operationally, their past underperformance against the wider market could risk hindering the government exertion towards Vision 2020 (PCG, 2014).

The Government-Linked Companies Transformation (GLCT) Programme initiated by the government in May 2004, with the primary attempt of enhancing GLCs administration as well as to improve their performance. This ten-year programme was also to assure the GLCs stay feasible and increasingly become international players. Currently, the committee is led by the Prime Minister with integrity of his position as the Finance Minister, along with contribution from the heads of 5 GLICs namely EPF, Khazanah, LTAT, LTH and PNB together with the selected Chief Executives Officer from GLCs. GLCs serve as the greater parts in the Kuala Lumpur Composite Index (KLCI) benchmark, they employ 5 percent of the total workforce in the country, and provide leading services for the community (PCG, 2007). There were 37 GLCs accounting for nearly 34 percent of the total market capitalization in 2007 and having a total market capital of RM361 billion (PCG, 2007). The GLCs were prompted to unwrap some of their subsidiaries in the chase of better performance and focus on their primary business transactions. And due to corporate restructuring, mergers and delisting, the amount of subsidiaries continues to sink. There were 33 GLCs by 2012, despite GLIC, as its institutional investors, as the substantial shareholder (Janang, Suhaimi & Salamudin, 2015).

1.2   Problem Statement

One of the famous topic discuss among scholar in finance field is about capital structure. In order to keep on track in business, the firms need to finance their financial deficit or new investment in projects through implement theories of capital structure. Capital structure indicates the firm's borrowing policy (Ross, Westerfield, & Jordan, 2001). When the company more emphasis on the increase of debt in capital

structure to earn more profit, it has high probability suffers from financial distress if the market direction was opposed with their expectation become economic downturn.

During 1990s, there is financial crisis occurred around the world causes a lot of companies facing financial distress where they are unable to meet their obligation to pay back the debt to their creditors. According to researchers Khaliq, Altarturi, Thaker, Harun, and Nahar (2014), financial crisis in Malaysia was triggered by companies' debt level. Companies which facing serious financial distress, no free cash flow and too much of illiquid asset would wound up the company, exit from the market. Researchers such as Deesomsak et al. (2004) had found that financial crisis will lead to changes in firm's financial decision on capital structure. They claim that raising capital become more costly during that period due to higher risk premier. Most of the Malaysian companies had gone through a restructuring process after financial crisis (Khaliq et al., 2014). Therefore, it is crucial for management team of the firms to determine internal factors that may influence the capital structure in debt level.

Furthermore, researcher Niu (2008) found that the relationship between capital structure and its factors remain inconsistent. This is due to different business entity had different strategies to control the capital structure. Since GLCs account for nearly 34 percent of the market capitalization of the Malaysian stock market, thus it plays an important part which contributes to the development of the country's economy. Many studies doing research on capital structure in different industry such as banking sector (Yegon & Rotich, 2014), small and medium enterprise (SME) (Saarani & Shahadan, 2013), construction sector (San & Heng, 2011), and other industry. However, there is insufficient of journal discussing the determinants of capital structure of GLCs in Malaysia (Wahab & Ramli, 2013). Therefore it is important to identify the determinant of capital structure of GLCs in Malaysia.

1.3   Research Objectives

This research is composed with objectives from two perspectives. There are the general objective and the specific objectives.

1.3.1 General Objective

The general objective is to examine the determinants of capital structure of Government-Linked Companies (GLCs) in Malaysia from 2010-2015.

1.3.2 Specific Objectives

The specific objectives proposed in this research are:

1) To examine the relationship between firm size and debt ratio.

2) To examine the relationship between liquidity of the firm and debt ratio.

3) To examine the relationship between profitability of the firm and debt ratio.

4) To examine the relationship between tangibility of the firm and debt ratio.

1.4   Research Questions

The research questions raised from this research are:

1) Is there any significant relationship between debt ratio and at least one of the independent variables?

2) Does firm size have significant effect on debt ratio?

3) Does liquidity of the firm have significant effect on debt ratio?

4) Does profitability of the firm have significant effect on debt ratio?

5) Does tangibility of the firm have significant effect on debt ratio?

1.5 Hypotheses of the Study

1.5.1 Firm Size

H_0: Firm size has no significant relationship on debt ratio.

H_1: Firm size has significant relationship on debt ratio.

Firm size is one of the important variables to explain debt ratio. The relationship between firm size and debt ratio is positive. This is because of bigger firm's possibility to have less volatile cash flow that they take on more debt to maximize the benefits. As a result, larger firms are more differentiated and possibility to fail less often than smaller firms. Researchers might think that they have better chances access to loan and are able to bear more leverage. (Friend & Lang, 1988). So, probability for larger firms to get bankruptcy and the transaction costs of issuing debt is lesser compared with smaller ones. However, Suhaila, Mahmood and Mansor (2008) found that smaller firms are more depend on debt than larger firms. Besides, size of the firm could be alternative of asymmetry information between managers and shareholders. Moreover, large firm are supposed to be related with lower level of asymmetry information compared with small firms. Fama and Jansen (1983) explain that large firms provide sufficient information to investor than small firms. Based on the lower asymmetry information, larger firms are supposed easier obtain lower cost of borrowing from financial institution.

1.5.2 Liquidity

H_0: Liquidity has no significant relationship on debt ratio.

H_1: Liquidity has significant relationship on debt ratio.

Liquidity means the asset or securities can be easily convert to cash, while the liquid assets or securities means it had high trading volume in the market. Liquidity of the asset is an important element to take into consideration because it shown how the firm able to meets its short-term obligations by using liquidity ratio. A firm with a higher liquidity ratio indicates that the firm has sufficient current asset to repay current liabilities during its daily operations (Wahab & Ramli, 2013). Researchers such as Wahab and Ramli (2013), Putek, Mahmood, Baharuddin and Mahadi (2014), and Sibilkov (2009), stated that there is significantly positive relationship between debt ratio and liquidity. The reason behind is a company with more liquid assets tends to borrow more from bank or any public debt markets, hence reach the optimal of leverage. The cost of monitor for liquid assets are low, hence if the company want to sell the illiquid assets, it must sell at discount from its face values. When the illiquid assets sell below its par value, it attracts more investors to buy, the illiquid assets become liquid asset now. It starts to incur more cost when the more of assets being sold since it sold below par value (Sibilkov, 2009). Thus there have positive relationship between liquidity and debt ratio.

1.5.3 Profitability

H_0: Return on assets (Profitability) has no significant relationship on debt
     ratio.

H_1: Return on assets (Profitability) has significant relationship on debt ratio.

Capital structure is significantly affected by various factors and firm's performance is one of the significant factors among them. Researchers used return on assets (ROA) as their proxy of profitability in this research. The ROA indicates the profitability of the firms relative to its total assets,

therefore giving potential investors the idea as to how the firms are effectively managing their assets to generate profits. Firms generally choosing their financing starting with retained earnings as the first choice for their investment funds (Wahab & Ramli, 2013). Shubita and Alsawalhah (2012) in their study found that the debt ratio has significant negative with profitability. The higher the debt, the lower the profitability of the firm; thus, an increase in debt position is associated with a decrease in profitability. The high leverage will affect performance become deteriorates; firms are more possible to take personal actions such as restructuring assets and laying off employees. Apart from that, a firm with higher debt will react quickly in financial through restructuring debt, cutting down dividend and bankruptcy (Ofek, 1993).

1.5.4 Tangibility

H_0: Tangibility has no significant relationship on debt ratio.
H_1: Tangibility has significant relationship on debt ratio.

The framework of tangible assets is important to explain the level of debt within firms (Giambona, Golec & Schwienbacher, 2014). Tangibility refers to asset composition in the firm (Wahab & Ramli, 2013). There is possibility for a firm to apply more debt with more tangible assets, since the assets can be used as pledge to lower credit risk (Jensen & Meckling, 1976). When the firm issues debt, it is a typical exercise for tangible assets to be subjected to a pledge, since financial institutions invariably have imperfect information about a firm's performance. The agency cost of debt is reduced with the high value of those assets. In other words, having a high proportion of collateralized tangible assets could lower the conflict between managers and shareholders. Myers (1984) reveals that through the fixed assets, firms generally have capability to keep up a larger usage of debt for its continual growth compared with intangible assets. For example, as in the event of

bankruptcy, intangible assets generate lower value than tangible assets. They demonstrate that successful companies will further increase borrowing with excess financing because of adequate sources of tangible assets. As a result, it is hypothesized that a positive relationship exists between debt ratio and tangibility.

1.6 Significance of study

1.6.1 Government

Government is vital to corporate governance in attracting investment and stabilizing market which will indirect promoting economic growth. According to Chu and Cheah (2004) government regulate micro policy, probably to standardize and defend the nation. In the incident of an agency conflict, it is the problem need to solve it using leverage due to the higher debt ratio compared with others firms. Most GLCs firm are established in government privatization programs and thus contribute to the economy by governing more than one third of the market capitalization (Salleh, Kundari & Alwi, 2011).

According to Jensen (1986), debt is known as an alternative mechanism to reduce the agency costs when manage under and overinvestment. Based on the past research, leverage is related with capital structure decision making. From this research, governments can exactly the extent of the optimal debt applied in the financial decision of the capital structure in GLCs in Malaysia. In order to obtain the maximization of firm value, capital structure may contribute the firm's leverage with different level of costs in the balanced amount. Therefore, government can take advantage in designing new policies that benefit the Malaysia economy to succeed highest sustainable growth and hence improve the living standard of Malaysian (Bhagat & Bolton, 2008).

1.6.2 Managers

This research might also be beneficial to managers too. Finance managers often face challenges when come into the topic to determine optimal capital structure of a company. Any incorrect financial decision may lead a vast impact towards company's financial distress or even more serious situation towards bankruptcy (Jamal et al., 2013). Managers may employ different specific strategies to improve firm's performance by viewing different intensities of debt and equity in one company's capital structure (Ting & Lean, 2011). Although government have controlling stake over GLCs, but still managers will bear the risk when making decision. There are many financial theories suggests that companies should attempt to attain an ideal capital structure, but in the real world still no particular method that has been acknowledged as a guideline to help managers in determining the optimal level of leverage. The ideal capital structure brings up the concept of maximized the value of firm by using a minimum cost of capital. This research will give financial managers insight on the factors that influence the capital structure of GLCs and hence assist managers in their decision making process.

1.6.3 Future Researcher

This research will benefit to future researcher as their reference. Since there are very few previous studies regarding determinants of capital structure has been done in Malaysia GLCs sector, this research can act as guidance for their future research and thus has a better understanding on this topic.

1.7   Chapter Layout

This research is arranged from Chapter 1 to Chapter 5. Chapter 2 will include further studies and analyzing of papers from the previous researchers. In chapter 3, the data description, the description of statistical tests will be presented. Chapter 4 consists of presentation and interpretation of statistical test and results by using data that had calculated. Last but not least, researchers will outlined the results and further discuss its implications in the last chapter of this research.

1.8   Conclusion

In short, Chapter 1 presents research background, problem statement, research objectives and questions, hypotheses of study, significance of research, and chapter layout used in analyzing the capital structure of Malaysia government-linked companies (GLCs). With a brief reviewing on the past literature, the researchers noticed that each of the independent variables have significant relationship with debt ratio. This has led the study of this research to the next step which is to examine deeper into previous literatures regarding to debt ratio, firm size, profitability, tangible asset and liquidity.

CHAPTER 2: LITERATURE REVIEW

2.0   Introduction

This chapter is to study existing research done by previous scholar so that the significant variables and their relationships with debt ratio can be studied and identified. In this chapter, researchers will focus more on the determinants of capital structure towards debt ratio. Besides, four independent variables such as firm size, liquidity, profitability and tangibility will be included to which each of them would contribute significance impact to the degree of leverage. These variables explanation will be discussed in details separately in 2.1. Following by the theoretical model will be discussed in 2.2. In 2.3, the conceptual framework will be shown along with the diagram of the expected relationships between debt ratio and all the variables.

2.1   Review of the Literature

2.1.1 Capital Structure

Capital structure speaks about the proportion of various long-term financing. It is one of the parts of financial structure in the company. In a simple way to explain, capital structure is a mixture of debt and equity. The portion of debt consists of long-term debt and short-term debt while the equity comprises of common shares and preferred shares (Ong & Teh, 2011). Debt can be in the form of long-term notes payables or bond issues and working capital requirement. Equity is classified into retained earnings, common stock and preferred stock. A company's proportion of debt and equity will be

determined after analyzing capital structure. The financing method of company either via debt financing or equity financing is depending on the policy of individual firms. Not every firm using the same method to finance its capital. For some companies, it is possible that wholly financed by debt while the equity portion is nil. The manager most likely pay more attention to firm's debt-to-equity ratio as it able to provide insight into how risky the company is.

2.1.2 Debt ratio

According to Suhaila et al., (2008), it is quite common is US by using long-standing debt ratio to define capital structure. But in a few countries like emerging countries, corporations using both short-term and long-term liabilities as their financial tools preference. This financing method is also widely adopted by companies in urbanized nations. In this research, Malaysia which also one of the emerging countries have been chosen as a target to be investigate. Hence, the capital structure of one firm is more appropriate to define by the company's total debt ratio. In equation, it can be expressed as below:

$$\text{Debt Ratio (DBT)} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

From the equation, the total debt comprises long-term and short-term debt. It means the sum of these two components. Total assets are the summation of fixed and current assets. In this research, debt ratio is employed to represent the level of leverage in a company. If a company debt ratio is higher means that it is too reliant on the leverage to finance its business operation while lower debt ratio means vice versa. Generally, the greater the ratio, the more chances that company will face nonpayment and subject to financial problem.

There are many researches had been done regarding the determinants of capital structure of a company. From various past researches stated that in defining a company's debt policy, different level of firm characteristics might have a significant relationship either positively or negatively towards the policy decision. According to Ting and Lean (2011), tangible assets, profitability, firm size have significant relationship towards debt ratio. Subsequently, Rajan and Zingales (1995) proved that the firm structure on leverage is affected by tangibility of the firm, firm size, profitability and growth. From their research also mentioned that these few factors can analyze more deeply about the firm capital structure. These also further supported by Wahab and Ramli (2013) that the debt and equity adoptions of Listed Malaysian Government linked Companies (GLCs) are subjective to the firm particular features and other macroeconomics factors. In this research, only the firm specific characteristics are tested while the macroeconomic factors were not included.

2.1.3 Debt ratio and Firm size

In most research paper, firm size has become a control variable in financial market even though it is not uncommonly among the significant variables. According to Friend and Lang (1988), the impact of firm size to debt ratio is expected to be positive. Larger firms are possible to be differentiated and not easy to obtain bankruptcy since a larger firm has higher flexibility in planning capital structure (Rajan & Zingales, 1995). Gruber and Warner (1977) also stated that the direct bankruptcy costs increases when firm value decreases and large firms tend to be more diversified which in turn resulting in large firms expected to be highly leveraged.

The trade-off theory expects firm size and debt ratio has positive relationship due to large firms tend to borrow more loan than small firms due to small

firms are afraid of high level of debt. Similarly, Al-Sakran (2001) and Hovakimian, Hovakimian and Tehranian (2004) provide empirical that the relationship between firms size and debt ratio is positive. They explained that if size of the firm increases, the needs of debt financing will also increase. Eriotis, Vasiliou and Ventoura-Neokosmidi (2007) suggested that large firms tend to be more diversified and direct cost of issuing debt or equity is lower. This result corresponds with the trade-off theory. Balla and Mateus (2002) did another study about the capital structure in Hungary and they found that there is direct relationship between firm size and debt ratio.

Hence, some researchers had proved that negative relationship between firm size and debt ratio based on pecking order theory. According to Wahab and Ramli (2013), they stated that larger firms show less asymmetry of information due to the large firms is monitored by analysts. So, these firms possibly may spread information respond to market sensitivity and are not as much of rely on leverage compared with small firms as they choose equity financing. Suhaila et al. (2008) explained that firm size has negative relationship with debt ratio and because of larger firms have a lesser amount of demand for debt than smaller firms.

2.1.4 Debt ratio and Liquidity

Liquidity ratio is usually used to measure the liquidity of a firm by using current asset and current liabilities. It can used to measure the ability of the firm to fulfill its short term obligation (Wahab & Ramli, 2013). Liquidity can either positively or negatively given impact on capital structure based on different research review.

The positive relationship between liquidity and leverage was supported by trade off theory. The rationale behind the positive effect of liquidity on

leverage is when the firms had many illiquid assets, they tends to reduce their probability of default, so they choose to reduce the debt or borrowing (Sibilkov, 2009). Putek et al. (2014) conclude that liquidity is positive and significant to total debt. They found that high liquidity firms prefer using cash invest in long term investment and finance short term debt.

On the other hand, negative relationship between liquidity and leverage was supported by Pecking Order theory. The rationale behind is that current asset able to use by the firms to finance their operation, thus there is no urgent for firms search for external financing (Wahab & Ramli, 2013). Niu (2008) stated that firms tend to form the liquid reserves from retained earnings account instead of raised for external funds for leverage sources. She proved that liquidity is negatively related to leverage. Researchers Lipson and Mortal (2009), Udomsirikul, Jumreornvong and Jiraporn (2011) also found that the firm with more liquid in equity, will tends to carry less debt because they prefer to raise equity rather than debt.

2.1.5 Debt ratio and Profitability

Profitability refers to the ability of a firm to earn a profit and is the primarily goal of all business ventures. Without profit business will not survive in the long run. Mohamad and Abdullah (2012), find a positive relationship between firm's leverage and profitability. Firms that generate high earnings are assumed to use less debt capital compared with equity that generates low earnings. Sayılgan, Karabacak and Küçükkocaoğlu (2006) propose a positive relationship that with the trade-off theory (TOT) if a profitable firm has better borrowing power and capability of loan payment it will get the loan more easily. According to this theory, the highest in debt level will increase the cost of bankruptcy and financial distress; hence decrease the value of the company. Gaud, Jani, Hoesli and Bender (2005) showed that firms can borrow more

loan if previous year profitability showed good figure. This is because they have higher probability to pay back the loans.

However, the pecking order theory (POT) proposed by Myers (1984) and Myers and Majluf (1984) predicts profitability is negatively associated with leverage. In this case the basis those successful companies prefer to finance with internal funds accumulated from previous profits. Besides, Paligorova and Xu (2012) found that their research were same with the POT assumption that firms normally follow a stratum in choosing their financing. The investors will priority look for retained earnings in the investment funds. (Myers, 1984). Maghyereh (2005) concluded that managers are unwilling to modify external financing and are more likely to use other financing method since they have more asymmetry information compared to creditor.

2.1.6 Debt ratio and Tangibility

Tangibility refers to asset framework of the firm. A firm with extra tangible assets tends to employ more debt as the assets can be collateralized to decrease default risk. According to Deesomsak et al. (2004), tangible assets like plant and equipment are easier to quantify than intangibles for outsiders, for instance, the value of goodwill from an acquisition. Tangible assets will be subjected to a pledge when the firm issues debt, since financial institutions frequently have asymmetric information about a firm's performance (Huang & Song, 2006). In this research, tangibility is measured as fixed assets divided by total assets.

Jensen and Meckling (1976) postulates that after the issuance of debt, the firm may shift to risky investment therefore transfer wealth away from debt holders to equity holders, hence agency cost of debt emerges. These assets can be

used by the firm as collateral with additional tangible assets, because the use of secured debts can help to mitigate this problem. Therefore, high leverage is expected to be correlated with a high proportion of tangible assets. In addition, as compared with intangible assets, tangible assets normally provide high value of collateral and liquidation, implying that leverage should increase with liquidation value and minimize the odds of giving a wrong price in the case of bankruptcy. There is a positive relationship between debt and tangible assets as found in most empirical results (Huang & Song, 2006; Ting & Lean, 2011; Wahab & Ramli, 2013). Firms will have to pay higher interest when they are not able to come up with collateral, or will be strained to issue equity rather than debt. However, firms with higher tangibility have higher preferences for equity which is lower cost and tend to have less asymmetric information. Thus a negative relationship between tangible assets and debts is indicated (Harris & Raviv, 1991).

Trade-off theory (TOT) proposes that fixed assets can serve as pledge for new loans therefore firms with higher ratio of fixed assets prefer to apply debt financing. Moreover, companies may be able to raise debt at a reduced cost with higher tangible assets ratios (Ting & Lean, 2011). Myers (1984) indicates that through fixed assets, firms have the capability to maintain a high usage of debt for its sustainable growth. However, Ahmed and Hisham (2009) reveal that TOT is not appropriate to explain the new debt issuance in the capital market of Malaysia. Pandey (2001) finds a negative relationship between tangibility and leverage.

2.2   Theoretical Model

2.2.1 Modigliani and Miller

The theory of capital structure developed since 1958, which proposed by Nobel laureates, Franco Modigliani and Merton Miller. They had done the research on cost of capital and the way of corporate finance. Based on the previous theorist conclude that cost of capital is the interest rate on bond from the owner of the firms' perspective, Modigliani and Miller proceed with two proposition: (i) investigate the invariance of firms' value with its capital structure, (ii) taken dividend policy into account which invariance with the firms' value too. After the research done, they conclude that, no optimal payout ratio can be found since the dividend policy did not affect the firm's value. The framework lately called as "irrelevance framework" or "invariance proposition".

According to Modigliani and Miller theory (M&M theory), they assume that there is no optimal debt to equity ratio and the firm's financing strategies did not affect the shareholder's wealth in a perfect market. The perfect market carried the characteristic of no taxes, bankruptcy and transaction cost, free from asymmetric information and all the firms having same risk class. This assumption had violated with the real world conditions.

Modigliani and Miller Proposition I pressure on the no taxes circumstances and debt had no related with firms' market value. The operating income of the firms is solely and independent from how firm's asset are finance. In order to support the debt irrelevant concept, they claim that shareholders can borrow same rate as firms' rate, this may double up the effect on firms' leverage level (Addae, Nyarko & Hughes, 2013). Second M&M Proposition II focuses on cost of equity and leverage proposition without taxes. This time they claim that cost of equity would increase linearly with firm's debt financing with

equal proportion. Furthermore, they stated that without risk premium, financing debt may look cheaper than equity, causes average cost of capital would not affected by increasing leverage. This is due to debt had priority claim while greater cost of equity would offset this effect. Hence, they claim that total cost is the best way to used when doing rational investment decision which measured by using required rate of return on fully equity-financed firms (Jensen, 1986).

After five year, Modigliani and Miller (1963) had modified their model and included corporate taxes into the previous model. The optimal capital structure can be maximized at 100 percent debt financing from the tax shield benefits of using debt. The value of firm now become higher with tax introduced. However, all those assumption made by both researchers are unrealistic to real world, thus it had been criticized by others researchers (Addae et al., 2013).

Despite the MM theory was not applicable to the real world conditions, but it had contributed to future theorists which had a deep sight in the theory of capital structure. They had essentially ignited the factors that may made capital structure relevant. Durand (1989) discover that financial leverage of the firms is vital because it affecting the overall cost of capital, the return from investment to the investors and the value of a firm.

There are three theory emerge after modified the basic theory of M&M, which more applicable in real world that are the Pecking Order Theory (hereafter POT), Static Trade-Off Theory (TOT) and Agency Theory (AT).

2.2.2 Static Trade-off Theory

The primary version of the trade-off theory came out of the argument over the Modigliani-Miller theorem. The theory indicates that as compared to equity financing, when firms are profitable they prefer debt financing as a way of enhancing their profits (Ting & Lean, 2011). Furthermore, when corporate income tax was added, debt is created as a benefit that it serves to protect income from taxes.

Figure 2.1: The Diagram of Static Trade-off Theory
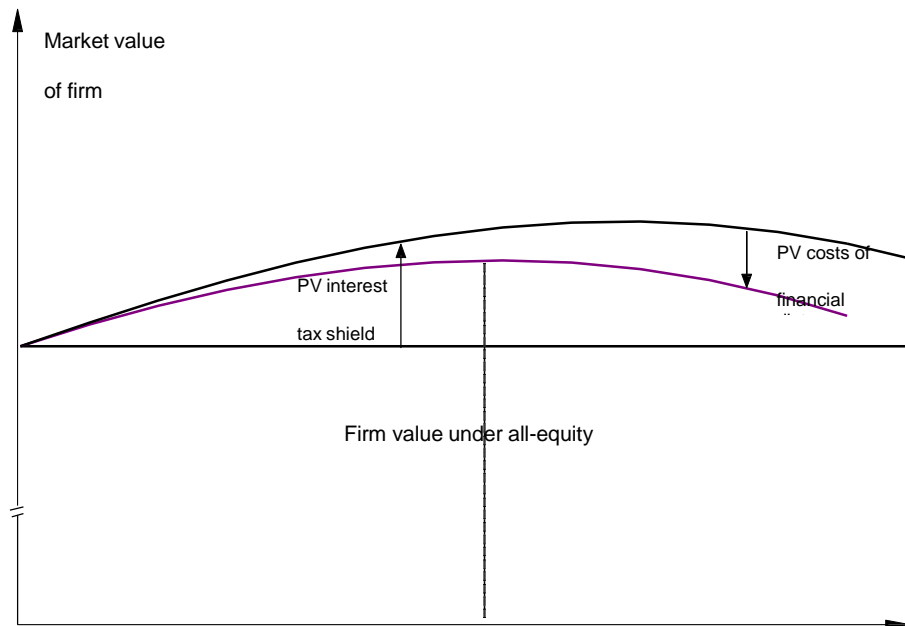
Adapted from: Deeley, C. (2004). *An Algorithmic Model of the Static Trade-off Theory of Capital Structure.*

100% debt financing is indicated when there is no offsetting cost of debt and the objective function of firm is linear. The offsetting cost of debt is required to avoid this extreme prediction. A classic statement is made by Harris and Raviv (1991) that optimal leverage reveals a trade-off between the tax advantages of debt and the costs of bankruptcy. As stated by Myers (1984), a

target debt ratio is first determined by firm that pursues the trade-off theory, after that it will move towards the target gradually. By harmonizing debt tax shields against deadweight costs of bankruptcy, the target is determined.

Static trade-off theory signifies the positive relationship between leverage and profitability in contrast to the pecking order theory. According to this theory, the increase in debt level will diminish the value of the company through the increasing cost of agency, bankruptcy, and financial distress. Thus, in the circumstance that the firm is not able to make an interest payment, for example, it may give rise to the increased cost of bankruptcy (Wahab & Ramli, 2013). A company therefore needs to find equilibrium which the level of debt would be able to offset its costs.

However there are more benefits and costs correlated with the use of debt and equity. When the firm is already at maximum value, more debt usage will not become beneficial to the firm and instead, incur additional costs. In short, profitable companies will resort to high debt financing by reducing bankruptcy costs, agency costs and taxes (Ahmad & Rahim, 2013).

2.2.3 Pecking-order Theory

In order to discuss capital structure, the pecking order theory also one of the famous financial principal that supports company chooses its capital structure. In the decision-making process, both static trade-off theory and pecking order theory show a comparable character. However the process of designing the capital structure mostly depend on the company wishes to accomplish.

However, most company's capital structure has been empirically perceived defined by pecking order theory. Pecking order theory assumes that the company chooses the capital based on the following preference, the first

category is from internal finance which refers to retained earnings, follow by debt and lastly equity (Chen & Chen, 2011). The pecking order theory created by Myers and Majluf (1984) based on two prominent assumptions. The first assumption propose that managers or insiders of a corporation have the higher chances possess private information about their firms' conditions such as firm's return stream or investment opportunities which outsiders may not know about the information. This asymmetric information matter arises when managers decide to issue new equity. This is because investors will infer this action as bad sign in the sense that they will assume that the stock price is issued at a overvalue price (Seifert & Gonenc, 2008). Second assumptions propose that managers work on behalf the interest of present shareholders. A firm would sacrifice the opportunity in investing in a positive net present value projects due to the issuance of undervalues shares to new investors in order to get the projects since firm's manager need to consider the welfare of their existing shareholders (Ahmadinia, Afrasiabishani & Hesami, 2012).

Chen, Chen, Chen and Huang (2013) stated that companies prefer internal to external financing on account of adverse selection. To lower the information cost associated with debt financing, managers would prefer debt over equity if there is additional fund needed. In addition, Leary and Roberts (2010) also mentioned that pecking order theory forecasts that preferences ranking over financing bases are created due to information asymmetry between managers and shareholders. In essence, the internal fund such as retained earnings of the firm will be used prior than other financial sources. If there is insufficient amount of internal sources the firm only will switch to external resources such as debt. Finally, as a last resort, the firm have to finance itself through issuing new shares, for instance, the firm will issue new shares to investors if they really need additional funds. Leary and Roberts (2010) added that firm work their way up the pecking order to finance the company is one of the ways to reduce the adverse selection problem.

2.2.4 Agency Cost Theory

In 1976, agency cost theory was developed by Jensen and Meckling. According to Jensen and Meckling (1976), this concept shows important issues in corporate governance in both financial and nonfinancial industries. They explore the nature of agency costs generated by the existence of debt and outside equity. According to Jensen and Meckling (1976), there were two debt agency problem which are asset substitution problem and under-investment problem. This problem will affect the final investment decision of a leveraged firm. Besides that, the total agency cost of debt will depend on the trade-off between two agency problems.

External capital market controlling brought to company by debt financing, forces manager in value maximizing strategies, rather than personal utility maximization (Easterbrook, 1984). According to Berger and Patti (2006), under agency cost hypothesis, high leverage reduces the agency cost of external equity and increases firm value by encouraging managers to focus more in the interests of shareholders. Besides, Berger and Patti (2006) states that higher leverage can reduce conflicts between shareholders and managers in the aspect of the investment decision, amount of risk can accept and the condition under which the firm is liquidated and dividend policy.

Debt is an effective tool to reduce the agency costs, and eventually optimal capital structure can be derived from the balance between the costs of debt against the benefits of debt. Grosseman and Hart (1982) argued that managers could pre-commit to work hard by using debt rather than equity. Besides, Jenson (1986) stated that increase in agency costs of debt will lead to increase of the bankruptcy costs. According to Myers (1977), firms may abandon good projects if they have significant debt outstanding because a large part of the returns will go to bondholders for a firm that facing financial crisis.

2.3   Conceptual Framework

In this research paper, assumptions are made on how all these variables will effect on the capital structure.

Figure 2.2: The expect relationship between independent variables and debt ratio.
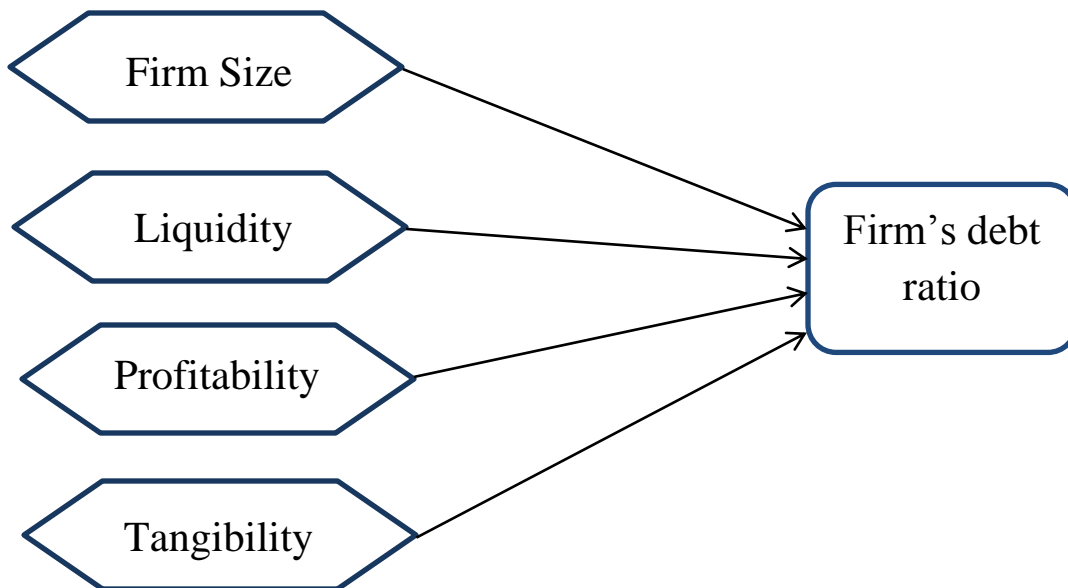
A framework of dependent variable and independent variables were deduced and is stated as above. The relationship of firm's capital structure will be tested with four independent variables which include firm size, liquidity, profitability and tangible asset.

2.4   Conclusion

In a nutshell, in Chapter 2, each explanatory variable are studied based on the prior researchers' findings and these findings will be used to support this research. Besides that, theoretical models are reviewed in order to develop the theoretical framework where this research able to postulate and investigate certain relationship among the variables.

CHAPTER 3: METHODOLOGY

3.0   Introduction

In Chapter 3 will briefly explain how the methodology of this research applied. The method is adopted with the aim of expressing the relationship between the government-linked companies (GLCs) debt ratio and firm size, liquidity, profitability and tangibility. This research employs annually data which start from the year 2010-2015. Research design, data collection method, data processing and data analysis are included in this chapter. The diagnostic checking and the empirical method will be further discussed in the data analysis part.

3.1   Research Design

Research design defines as the overall strategy that specifies the methods and procedures for collecting, measuring and analyzing numerical data. Besides, it also refers as a document of the study and a framework that formed to seek answers to research question. In this research, quantitative research approach is chosen as research method. The researchers use quantitative research to examine the relationship between dependent variable (debt ratio) and independent variable (firm size, liquidity, profitability and tangibility). Moreover, quantitative approach is quite easy if compared with qualitative approach and it can provide an exact value to measurement. These quantitative data will be used to run the tests and determine whether independent variables are significant to the dependent variables.

Besides, all the data for analysis can be obtained from annual report of companies and panel data were applied in this research. This research collected a set of data which are predetermined to yield statistical data. In this case, it is the more structured data collection technique. With this technique, it lets researchers to track the trends provided by the summary of the information of the variables. The reason why panel data model is chosen due to it is more adjustable for time series and cross sectional data. Mahakud and Misra (2009) use panel data analysis to prove that it is an effective tool to manage and capable to dominate the firm structure affects which are unexamined.

3.2   Data Collection Method

In this research, five variables are included which are firm size, liquidity, profitability, tangibility and debt ratio. With the aim of finding out the relationship between the chosen explanatory variables and explained variable, there are some measurements have been use to estimate the independent variables. Each independent variable has specific formula to calculate. Firm size is measured by natural logarithm of net sales; Liquidity is represent by current ratio which come from current assets divided by current liabilities; Profitability is refer to earnings before interest, tax and depreciation divided by total assets; Tangibility is refer to fixed assets divided by total assets; Debt ratio is denoted as total debt divided by total assets. All the data are obtained from the financial statement of Malaysia listed GLCs derived from Bursa Malaysia. Initially there are 47 listed Government-linked companies in Bursa Malaysia, but after deducting some companies which have missing data, the balance 30 companies is tested in this research.

3.2.1 Secondary Data

Table 3.1: Data sources

Variables	Proxies	Measurement of Variables	Sources
Dependent Variable			
Debt Ratio	DBT	$\dfrac{\text{Total debt}}{\text{Total assets}}$	Annual Report
Independent Variables			
Firm Size	SZE	Natural logarithm of sales	Annual Report
Liquidity	LIQ	$\dfrac{\text{Current assets}}{\text{Current liabilities}}$	Annual Report
Profitability	PRO	$\dfrac{\text{Earnings before interest and taxes}}{\text{Total assets}}$	Annual Report
Tangibility	TAN	$\dfrac{\text{Total fixed assets}}{\text{Total assets}}$	Annual Report

3.3   Sampling Design

3.3.1 Target Population

The government-linked companies (GLCs) in Malaysia have been chosen as this research investigate target. GLCs are companies that the Malaysia's Government has a direct monitoring power on it and they have a primary commercial objective. At the first glance, there are 47 GLCs listed in Bursa Malaysia. The reason for choosing listed GLCs is because these companies have publicly available financial and accounting data. Those data are more

reliable. Yet, after the data is collected, there are a few companies unable to provide complete data in a certain period or few years. The missing data are such as net income, current assets, long-term debt and so on was not provided in some companies. Therefore, due to missing data researcher have decided to drop those companies. After all the data is filtered, 17 companies have been eliminated which unable to provide complete data for this research. So, at last the sample size was only remain 30 government-linked companies (GLCs) in Malaysia and 6 years annual reports which start from year 2010-2015 for each sample will be tested. Sampling is a method of selecting a random sample from a population to draw a conclusion about the whole population as well as to capture the unknown piece of information (Zikmund, Babin, Carr & Griffin, 2010). Sampling method is chosen in this research due to the limitation of time constraints and budget.

Table 3.2: Data Filtration

	All Firms (N=30 sample firms; t=2010 to 2015)
Original Number of Companies and Observations ($N \times t$)	47 (282 Obs)
Minus: Missing Data	17 (102 obs)
Final Sample	30 (180 Obs)

Notes: The list of 30 Malaysian government-linked companies during 2010 to 2015 is attached in Appendix 1.

3.3.2 Sampling Technique

According to Gujarati (2003), there are three types of data in researchers which are time series data, cross sectional data and panel data. EViews is a spread sheet used for various types of data analysis. EViews can provide first hand data analysis, regression, and forecasting tools on Windows based computers. With EViews, researcher can effectively manage their data, perform econometric and statistical analysis and generates prognosis or model imitation. Besides that, EViews can produce high quality tables and graphs for publication or inclusion in other applications. In addition to its increased functionality, it also operates at faster pace; both in terms of calculation time and in terms of ease of use especially EViews data series analysis functions are superior to many of its competitors.

By using the data collected, this research uses EViews 8 to generate the econometric analysis which including data analysis, diagnostic checking, panel regression analysis and empirical results. For the diagnostic checking, multicollinearity problem occurs when two or more independent variables in the model are correlated and provide excessive information about the response. When high multicollinearity problem detected means that standard error of estimates of the β's increased and will confusing and misleading the results. Next, we will check about autocorrelation problem in the model. Autocorrelation is a mathematical representation of the degree of similarity between a given time series and a lagged version of itself over successive time intervals. When computed, the resulting number can range from +1 to -1. An autocorrelation of +1 represents perfect positive correlation, while a value of -1 represents negative correlation.

3.4   Data Processing

<u>Figure 3.1: Data Processing</u>

Collecting secondary data from annual report of selected GLCs

Calculating the financial ratio using collected data

Generate empirical analysis by using EViews 8

Intepreting the empirical result

Drawing short summary about the result
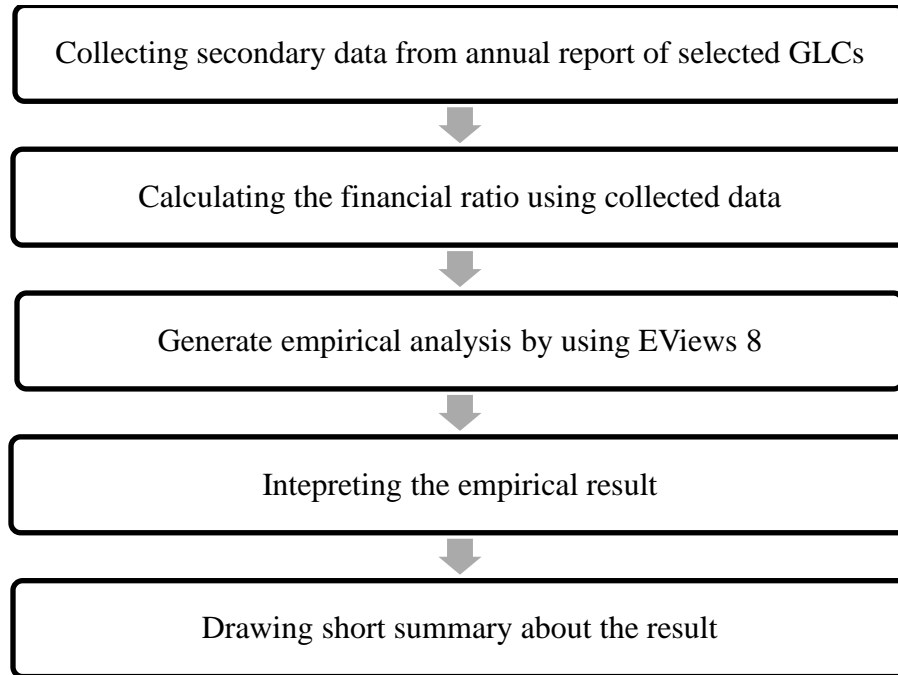
Flow chart above showing the data process will be carried throughout this research. There are total 30 of selected GLCs listed on Bursa Malaysia from year 2010 to 2015 used as sample data. All of the data collected from the annual report of each GLC. After that, using the formula (stated in Table 3.1) calculate the ratio respectively. EViews 8, one type computer software which helps to generate pool panel data analysis used to regress the output of the model. Finally, interpret the result and come out short summary about the significance of the result.

3.5 Diagnostic Checking

3.5.1 Normality Test

Normality Test is a necessary test to check whether the error term in the model is normally distributed. There are various methods to conduct normality test but in this research Jarque-Bera (JB) test is employed by using EViews 8. According to Classical Normal Linear Regression Model (CNLRM), the assumptions stated that error term is normally distributed with zero mean value of the disturbances, zero covariance and the variance of error term is constant (Gujarati & Porter, 2009). Normality test is crucial when the sample size is small. It is less important when the sample size is large. According to Gujarati and Porter (2009) for any sample increase in size, the expected mean of error term is approximate normally distributed and Central Limit Theorem say so. The Jarque-Bera test is computes by the joint hypothesis of skewness and kurtosis the random variable.

H_0 : Normality of error term.

H_1 : Non-normality of error term.

The Jarque-Bera test statistic can be calculated by the following formula:

$$JB = n[\frac{S^2}{6} + \frac{(K-3)^2}{24}]$$

Decision rule: Reject H_0, if p-value of Jarque-Bera statistics is lower than the 5% significance level. Otherwise, do not reject H_0. The p-value must be higher than 5% significance level, then null hypotheses will not be rejected and conclude that the error term does follows the normality distribution.

3.5.2 Multicollinearity

Multicollinearity means that there is a perfect relationship among some or all independent variables. It also means that some of the independent variables are highly interrelated among each other. According to Gujarati (2003), in order to know how serious the degree of multicollinearity, Pearson correlation test is used to estimate the pairwise correlation coefficient between explanatory variables. The rule of correlation test is that the coefficient of correlation must below than 0.8, otherwise it is considered to have serious multicollinearity problem.

There is no certain standard to assess the multicollinearity of the linear regression model. However, there are some formal ways to check for the related statistics such as variance inflation factor (VIF) and tolerance factor (TOL). Variance inflation factor (VIF) computes the severity of multicollinearity in regression analysis. VIF can be defined as $\frac{1}{(1-r^2)}$. When VIF values exceed 10, it implies that the both of the independent variables have serious multicollinearity (Gujarati & Porter, 2009). Furthermore, tolerance (TOL) is an inverse of VIF. It denotes by $1-r^2$. When TOL value is zero, it indicates perfect collinearity; if the value is one, there is no collinearity happens between independent variables (Williams, 2005).

3.5.3 Autocorrelation

Autocorrelation is defined as the error term for any observations is associated to the error term of other observations order either in time series or cross sectional. If the results showed higher values of t-statistics and F-statistics, it means that autocorrelation problem happen in the model and tends to make variances of OLS estimators underestimates (Gujarati & Porter, 2009).

Durbin-Watson test is a test that commonly used to detect the first order autocorrelation problem in the regression analysis. This test is able to use for the normal distribution if the sample size is large. Its critical value is relies on the sample size and number of independent variables (Akter, 2014). The hypothesis testing of Durbin-Watson test is defined as:

H_0 : There is no autocorrelation problem, $\rho = 0$.

H_1 : There is autocorrelation problem, $\rho \neq 0$.

As a rule of thumb, if there is no autocorrelation, $\rho = 0$ and d-statistic should be distributed randomly around 2; if there is severe positive autocorrelation, ρ will be near 1 and d-statistic should be near 0. Likewise, ρ will be near -1 and d-statistic should be near 4 shows the severe negative autocorrelation (Tabachnick, Fidell & Osterlind, 2001). According to Ayyangar (2007), the decision rule of Durbin-Watson test for autocorrelation is defined as there is no autocorrelation if the Durbin-Watson value is between 1.5 and 2.5. If there is autocorrelation problem occur in the model, it may lead to researcher have false inferences about the significancy of parameters. The variance of estimators will underestimate and causes the outcome become less reliable (Jeeshim & Kucc625, 2002).

3.6   Data analysis

3.6.1 Panel Data

In econometric terms, panel data is defined as the multi-dimensional data frequently involving measurements over times on a number of cross-sectional units. Panel data also known as longitudinal data, is one that provides several observations on every individual is multiple over time from the sample (Hsiao, 2007). This means that panel data consist of cross sectional and time series

data. The reasons panel data technique is used in this research because of its give more information data and more variability. Besides, the degree of freedom increase and the collinearity will reduce among independent variables. Multicollinearity problem can be reducing. In addition, panel data can construct and analyze more complicated models. Panel data is used to determine key econometric problem that commonly arises in empirical studies. In this research, pooled OLS model, random effect and fixed effect model will be attempted to apply to solve the problem.

The regression model in this research:

$$DBT_{i,t} = \beta_0 + \beta_1 SZE_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 PRO_{i,t} + \beta_4 TAN_{i,t} + \varepsilon_{i,t}$$

DBT = Debt ratio

β_0 = Intercept for the regression model

$\beta_1, \beta_2, \beta_3, \beta_4$ = Partial regression coefficients

SZE = Natural logarithm of Total Sales

LIQ = Liquidity ratio

PRO = Profitability ratio

TAN = Tangibility ratio

ε = Error terms of the regression model

3.6.2 Pooled OLS Model

Pooled OLS is known as time invariant and the intercepts and slopes are remaining constant. This is because the characteristics for this model for given observations are constant over time. Since it is constant, it can it can interpret in the simple and easy way compare with others models. When there is homogeneity, pooled OLS will be used. Heterogeneity exists between the observations over the periods of time due to the estimated parameter values become biased, inefficient and inconsistent.

3.6.3 Fixed Effects Model (FEM)

Fixed Effects Model (FEM) is to control for omitted variables that differ between cases. In this model, the intercepts are different while the slopes are fixed. Based on intercept term irrespective of time effect, FEM is suitable to investigate the individual's characteristics for each observation in the sample. However, if too many dummy variables are including into the model, the degree freedom will decrease, hence some of the important information will be losses. Besides, too much independent variable will cause multicollinearity problem.

$$Y_{i,t} = \beta_1 + \beta_2 X_{2i,t} + e_{i,t}$$

Where:

$Y_{i,t}$ = Dependent variable

β_1 = Unobserved random variable characterizing each unit of observation

β_2 = Vector of parameter of interest

$X_{2i,t}$ = Vector of observable random variables

$e_{i,t}$ = Stochastic error uncorrelated with x

3.6.4 Random Effect Model (REM)

Random Effects Model (REM) refers to omitted variables that may be fixed over time but different between cases, and others may be fixed among case but different over time. Based on the random error terms, this model is used to investigate the individual's characteristics for each observation in the sample. However, the random error terms can capture the different characteristics and observations at certain times. Besides, this model does not consist of dummy variables. This is because in this model, an unknown parameter of number has reduced if compare to FEM model. When the number of independent variables has decrease, the probability of getting multicollinearity problem will reduce.

Start with the basic panel data model:

$$Y_{i,t} = \beta_{i,t} + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + e_{i.t}$$

Where:

β_1 represents the mean value of the entire panel intercept. It is not treated to be fixed and suppose that it is a random variable with a mean value of, $\beta_{i,t}$ and the intercept value for an individual firm can be expressed as:

$\beta_{i,t} = \beta_i + \varepsilon_i$ $\qquad\qquad\qquad\qquad$ i = 1,2,3……

Where:

ε_i = A random error term with a mean value of zero and variance of σ^2

$$Y_{i,t} = \beta_i + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + \varepsilon_i + u_{i,t}$$

$$Y_{i,t} = \beta_i + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + w_{i,t}$$

$w_{i,t}$ = Composite error term (consist of two components, r_i and r_i)

r_i = The individual-specific or cross section error component is random or not constant

$u_{i,t}$ = Combination between time series and cross sectional error component

3.6.5 Poolability test

Poolability test was conducted to test which empirical model between Pooled OLS or FEM is more suitable for estimating the equation. This is the first step to check whether which model is more suitable to estimate this set data.

H_0: There is a common intercept on all the companies.
H_1: There is no common intercept on all the companies.

Decision Rule: Reject H_0, if the probability of F-statistic is less than 5% significant level; otherwise, do not reject H_0.

Reject H_0 means that pooled OLS model is not valid and FEM is more appropriate.

3.6.6 Breusch and Pagan LM Test

Breusch-Pagan Largrange Multiple (BPLM) Test is to examine whether any random effects exists in the regression (Park, 2011). Breusch-Pagan Test is to test conditional heteroskedasticity. Lagrange Multiple (LM) statistic is following the chi-square distribution with 1 degree of freedom. The hypothesis can be structured like no random individual effect is null

hypothesis, so if the result reject null hypothesis, it can be conclude that REM is preferable.

H_0: There is no random effect, $\sigma_i^2 = 0$, where i=1,2,3,…

H_1: There is random effect, $\sigma_i^2 \neq 0$, where i=1,2,3,…

Decision Rule: Reject H_0 if the probability value (p-value) is less than 5%, otherwise do not reject H_0.

Reject H_0 means that that pooled OLS model is not valid and REM is more appropriate.

3.6.7 Hausman Test

According to Torres-Reyna (2007), this researcher mentions that Hausman test can be used to choose between FEM and REM. This test is mainly tests whether the disturbance is correlated with other explanatory variables. The null hypothesis of this test is both the estimators of FEM and REM do not vary significantly. If the test refuses the null hypothesis, it concluded that the REM is not appropriate while FEM is preferred (Gujarati & Porter, 2009).

H_0 : There is no correlation between firm individual effect and X_{it} (consistency).

H_1 : There has correlation between firm individual effect and X_{it} (consistency).

Decision Rule: Reject H_0 if the probability of test statistic (H) is less than 5% significant level; otherwise do not reject H_0.

Reject H_0 means that firm individual effects is important and then FEM is more appropriate than REM.

3.7   Regression Analysis

3.7.1 F-Test

According to Gujarati (2003) claims that F-test is conduct to determine the overall significance of the regression model. In other word, it is a test that examine whether at least one of the explanatory variables is important in explaining the dependent variable. By the way, if one or few of the independent variables is statistically insignificant, it does not mean that the overall regression coefficient also to be insignificant. In particular, F-test is having multifunction as it can test for several kinds of hypotheses, such as whether an independent variable is statistically significant, some or all coefficients are statistically equal and so on.

This research F-test is conducted to examine the overall significance of regression models by using 10%, 5% and 1% significant level as benchmark. As holding a decision rule that if the p-value is less than 0.10, 0.05 and 0.01 (10%, 5% and 1% significant level), null hypothesis will be rejected. This implies that there is at least one of the independent variables is important in clarifying the dependent variable, ceteris paribus. The hypothesis is stated as follows:

H_0 : $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$
H_1 **:** At least one of the independent variables is important in explaining the dependent variable.

3.7.2 T-Test

T-test is to examine whether there is a significant or insignificant relationship of independent variable towards the dependent variable individually (Gujarati, 2003). T-test also applies 10%, 5% and 1% significant level as a benchmark which similar likes F-test. As holding a decision rule that if the p-value is less than 0.10, 0.05 and 0.01 (10%, 5% and 1% significant level), null hypothesis will be rejected. This indicates that the independent variable has a significant relationship towards dependent variable, ceteris paribus. There are total four hypotheses are carried out for dependent variables and each independent variables in this research as stated in general as follows:

H_0: The independent variable and dependent variable showed no significant relationship between each other.

H_1: The independent variable and dependent variable showed significant relationship between each other.

3.8 Conclusion

After collecting the data from Annual Report, these data are then calculated based on several formulas. The results is then used to run the test to determine whether there are significance between independents variables (firm size, liquidity, profitability and tangibility) and dependent variable (debt ratio) by using the EViews 8 software. There are total of 30 companies after the filtration take into account and the period of research started from 2010 to 2015. The results and analysis of each test will be further explained in Chapter Four.

CHAPTER 4: DATA ANALYSIS

4.0   Introduction

In this chapter 4 will conduct the diagnostic checking by using empirical method. 30 GLCs in Malaysia from year 2010 to 2015 had been chosen for data analysis. Firstly, normality test had conducted and then carried out multicollinearity test. Panel data such as Poolibility hypothesis testing, Breusch Pagan LM test and Hausman test had been used to test the most suitable model in this data analysis. All of the result is generated from EViews 8. Further explanation will be discussed after each test's result.

4.1   Descriptive Statistic

Table 4.1: Summary of Descriptive Statistic of All Variables

Sample Firm: N=30 No.of Obs=180	DBT	SZE	LIQ	PRO	TAN
Mean	0.339323	7.443058	6.597461	1.987040	0.660438
Median	0.343684	6.529275	1.270850	0.071625	0.717380
Maximum	0.906700	59.76690	126.4576	10.65772	0.975608
Minimum	0.002015	0.562923	0.031900	1.18E-05	0.044354
Std. Dev.	0.225041	7.374896	18.78547	3.629438	0.212991

Notes: 1. The panel data runs for six year period, from years 2010 to 2015; N= 30

Government Listed Company; No. of observations for six years= 180;

2. DBT = Debt Ratio; SZE = Firm Size; LIQ = Liquidity; PRO = Profitability;

TAN = Tangibility

From the table 4.1 presented the results relevant to descriptive statistics for all the variables in model (e.g., Debt ratio (DBT), Firm Size (SZE), Liquidity (LIQ), Profitability (PRO) and Tangibility (TAN) employed in this research on Malaysia Government Listed Company (GLC) from 2010 to 2015, which are explained as follows:

4.1.1 Debt Ratio

The mean and standard deviation of debt ratio in this research is 0.339323 and 0.225041 respectively. This result is relatively higher than the research made by Sánchez-Vidal (2013) in Spain which he get mean value of 0.228 and standard deviation of 0.211. The range of minimum and maximum for DEBT is recorded at 0.002015 and 0.906700.

4.1.2 Firm Size

The measure of a firm's size used in this research is the natural logarithm of its sales. The average of the firm size in this research is 7.443058 and the median value is 6.529275. Niresh and Thirunavukkarasu (2014) indicated that the average firm size of 8.97 from the sample of 15 companies listed in CSE over the periods from year 2008 to 2012 and it is higher than the result of this research. The range of minimum and maximum for firm size is 0.562923 and 59.76690 in this research which is inconsistent with the research made by Thippayana (2014) focus on 144 listed firms in the Stock Exchange of Thailand for the twelve years from 2000 to 2011, 12.39 for minimum and 21.47 for maximum.

4.1.3 Profitability

On average, the profitability of government linked company in Malaysia is 1.987 based on 180 observations. The range of minimum and maximum for PRF is 0.0000118 and 10.65772. According to the study of Oino and Ukaegbu (2015), they investigated the performance of Nigerian listed non-financial firms and they get mean value of 0.161 which is lower than this research. Besides, they get the range of minimum (-0.042) and maximum (1.291) that inconsistent with this research.

4.1.4 Liquidity

This research showed that the range of minimum and maximum for liquidity is 0.0319 and 126.4576 respectively. Liquidity is known as current ratio, which is determined by dividing current assets by current liabilities. The average of liquidity in this research is 6.597461. Standard deviation in the research of Khidmat and Rehman (2014) is 151.92 which is higher than the standard deviation in this research (18.78547).

4.1.5 Tangibility

The tangibility is calculated by dividing total fixed assets with total assets. The value of mean and standard deviation of tangibility in government linked company in this research is 0.660438 and 0.212991 respectively. This result is higher than the research by Pacheco and Tavaras (2015), which they get 0.47 for mean and 0.18 for standard deviation. The range of minimum and maximum for tangibility is recorded at 0.044354 and 0.975608.

4.2   Diagnostic Checking

4.2.1 Normality Test

Table 4.2: Jarque-Bera Test

Sample Firms: N=30	
No. of observation: 180	
Hypothesis	H_0: Normality of error term.
	H_1: Non-normality of error term.
Jarque-Bera	7.519155
P-value	0.023294**
Result	Reject H_0, the error term is not normally distributed.

Note: *, **, ***, Significant at 10%, 5%, 1% respectively.

The result of normality test as shown in Table 4.2, the error term of research model is not normally distributed. The p-value of Jarque-Bera test is significant at level of 5%. This result concludes that null hypothesis is being rejected as well as it indicates the error terms are not normally distributed. However, according to the theory of Central Limit Theorem (CLT), the sample is tend to be normally distributed when the sample of a research consist of large sample size that exceed 100 observations (Gujarati & Porter, 2009). This model is assumed to be normally distributed since the sample size of the research consists of 180 observations and therefore the assumption of CLT has been fulfilled.

4.2.2 Multicolinearity

Table 4.3: Pair-wise Correlation Matrix

	SZE	LIQ	PRO	TAN
SZE	1.000000	-0.060843	0.052009	0.094150
LIQ	-0.060843	1.000000	-0.014167	-0.057524
PRO	0.052009	-0.014167	1.000000	0.131941
TAN	0.094150	-0.057524	0.131941	1.000000

Notes: SZE: Firm Size; LIQ = Liquidity; PRO = Profitability; TAN = Tangibility

The pair-wise test correlation coefficient has been used in this research for detecting the problem of multicollinearity. According to Gujarati and Porter (2009), the problem of multicollinearity occur when the correlation of pair of independent variables are more than 0.8. Based on the result of test shown in Table 4.3, this research concludes that there is no serious multicollinearity problem in this model since the correlation of independent variables are less than 0.8.

Table 4.4: Variance Inflation Factor (VIF) for Each Independent Variable

Independent Variables	R²	VIF $= \frac{1}{1-R^2}$	Conclusion
SZE	0.013512	1.013697	No Serious Multicollinearity
LIQ	0.006428	1.006469	No Serious Multicollinearity
PRO	0.019009	1.019377	No Serious Multicollinearity
TAN	0.027598	1.028381	No Serious Multicollinearity

Based on the result in Table 4.4, the value of VIF for all independent variables are less than 10. According to Table 4.4, the highest VIF is 1.028381. This result shows that none of the variable has serious multicollinearity in this regression model.

4.2.3 Autocorrelation

<u>Table 4.5: Autocorrelation Table</u>

Sample Firms: N=30 No. of obs: 180	
Hypothesis	$H_0: \rho = 0$ $H_1: \rho \neq 0$
Durbin-Watson Statistic (d)	1.833502
Result	No Autocorrelation

The result of Durbin-Watson test as show in Table 4.5, the Durbin-Watson d-value is 1.833502 for this model. According to Ayyangar (2007), the decision rules for Durbin-Watson test for autocorrelation are defined as there is no autocorrelation if the Durbin-Watson value is between 1.5 and 2.5. Since the Durbin-Watson d-statistic for this model is in the range of 1.5 to 2.5, therefore this result conclude that alternative hypothesis is being rejected as well as concluded the autocorrelation problem does not exist in this model.

4.3 Panel Regression Analysis

4.3.1 Poolability Hypothesis Testing

Table 4.6: Summary of Poolability Hypothesis Testing

Sample Firms: N=30	
No. of observation: 180	

Hypothesis	H_0: There is a common intercept on all the companies. (Pooled OLS Model is better) H_1: There is no common intercept on all the companies. (FEM is better).
Decision Rule	Reject H_0 if the p-value is smaller than 0.05. Otherwise, do not reject H_0.
P-value	0.0000***
Result	Proceed to BPLM test

Note: *, **, ***, Significant at 10%, 5%, 1% respectively.

Based on the EViews 8 results on Table 4.6, the p-value for research model is 0.0000. It is significant at level of 5%. Therefore, this research rejects the null hypothesis whereby the pooled OLS is no longer applying at 5% significant level. The test will proceed to Breusch-Pagan Lagrange Multiple (BPLM) test for further decision to select REM or Pooled OLS model.

4.3.2 Breusch-Pagan Lagrange Multiple (BPLM) Test

Table 4.7: Summary of Breusch- Pagan Lagrange Multiple (BPLM) Test

Sample Firms: N=30	
No of observation: 180	
Hypothesis	H_0: There is no random effect, $\sigma_i^2 = 0$, where i=1, 2, 3,… (Pool OLS model is preferable) H_1: There is random effect, $\sigma_i^2 = 0$, where i=1, 2, 3,… (Random Effect Model is preferable)
Decision Rule	Reject H_0 if the p-value is smaller than 0.05. Otherwise, do not reject H_0.
Probability	0.0000***
Result	REM is preferable.

Note: *, **, ***, Significant at 10%, 5%, 1% respectively.

Based on the EViews 8 result on Table 4.7 of BPLM test for research model, the probability is 0.000 and significant at level of 5%. Therefore, this research rejects the null hypothesis whereby REM is preferable at 5% significant level. The test will be proceeding to Hausman Test for further decision to select REM or FEM.

4.3.3 Hausman Test

Table 4.8: Summary of Hausman Test

No. of firms : 30	
No. of observation : 180	

Hypothesis	H_0: REM is consistent and efficient
	    (REM is preferable)
	H_1: REM is inconsistent and inefficient
	    (FEM is preferable)

Decision Rule	Reject H_0 if the p-value is smaller than 0.05. Otherwise, do not reject H_0.
P- value	0.1797
Decision : Random Effect Model is preferable.	

Note: *, **, ***, Significant at 10%, 5%, 1% respectively.

This Hausman test is test about whether Random Effect Model (REM) or Fixed Effect Model is the best model after conducting this test. According to result shown in Table 4.8, null hypothesis cannot be rejected because the p-value is larger than the significant level of 5%. Thus it can be conclude that REM is more preferable compare to FEM.

4.3.4 R-square

Table 4.9: Summary of R-square Result

No. of firms : 30	
No. of observation : 180	
R squared	0.065565
Adjusted R squared	0.044206

R-squared in regression analysis plays the role that measure how strong the connection between independent variable and dependent variable. While the different between adjusted R squared and R squared is only adjusted R square had taking degree of freedom into account. When the number of variable in the model increase, the value of R square and adjusted R squared will increase, while the number of variable decrease, the value of R square and adjusted R squared will decrease.

Result shown in Table 4.9 stated the value of R square is 0.06557 which means that there is 6.557% of variation that debt ratio can be explain by firm size, liquidity ratio, profitability ratio, and tangibility ratio of the company. On the other hand, the value of adjusted R square is 0.044206 indicates that there is 4.421% of total variation debt ratio can be explained by firm size, liquidity ratio, profitability ratio, and tangibility ratio of the company when degree of freedom taking into account.

4.3.5 F-statistic

Table 4.10: Summary of F-statistic

No. of firms : 30	
No. of observation : 180	
Hypothesis	H_0**:** $\beta_1 = \beta_2 = \beta_3 == \beta_4 = 0$ H_1**:** At least one of the coefficient is different from 0.
Decision Rule	Reject H_0**:** if the p-value is smaller than 0.05. Otherwise, do not reject H_0.
P-value	0.01785 **
Conclusion	Reject H_0

Note : i) β_1 represent firm size, β_2 represent liquidity ratio, β_3 represent profitability,

   β_4 represent tangibility ratio.

   ii) *, **, ***, Significant at 10%, 5%, 1% respectively.

F statistic is test for the significant of a group of variable when joint together. According to Table 4.10, it shows that the overall model is significant because p-value of 0.01785 is lower than the level of significant 5%. Hence, there is sufficient evidence to conclude that the model is significant at 5% significant level.

4.3.6 T-statistic

Table 4.11: T-statistic

Independent variable	Hypothesis	Decision Rule	P-value	Decision	Conclusion
Firm Size	$H_o : \beta_1 = 0$ $H_1 : \beta_1 \neq 0$	Reject H_0 if p-value is smaller than 0.05. Otherwise do no reject H_0.	0.0410 **	Reject H_0.	Firm size is significantly affects the debt ratio.
Liquidity	$H_o : \beta_2 = 0$ $H_1 : \beta_2 \neq 0$	Reject H_0 if p-value is smaller than 0.05. Otherwise do no reject H_0.	0.0149 **	Reject H_0.	Liquidity is significantly affects the debt ratio.
Profitability	$H_o : \beta_3 = 0$ $H_1 : \beta_3 \neq 0$	Reject H_0 if p-value is smaller than 0.05. Otherwise do no reject H_0.	0.1955	Do not reject H_0.	Profitability is insignificantly affects the debt ratio.
Tangibility	$H_o : \beta_4 = 0$ $H_1 : \beta_4 \neq 0$	Reject H_0 if p-value is smaller than 0.05. Otherwise do no reject H_0.	0.6967	Do not reject H_0.	Tangibility is insignificantly affects the debt ratio.

Note: *, **, ***, Significant at 10%, 5%, 1% respectively

T-statistic was used to test significance of single independent variable affect the dependent variable, debt ratio. According to Table 4.11, firm size and liquidity are significantly affects debt ratio while profitability and tangibility are unable to affect the debt ratio of GLCs.

4.4   Conclusion

In conclusion, after carried out the diagnostic checking of 30 GLCs in Malaysia from year 2010 to 2015, the most suitable model is REM. The result shows that firm size and liquidity are significantly affect the debt ratio of GLCs. On the other hand, profitability and tangibility are found that insignificant to the debt ratio.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0   Introduction

In this topic comprises outline of hypothesis testing and independent variables from the last chapter. Moreover, in this topic will discuss further on major findings, implication, limitations and recommendations of the research. Thus, the overall research will be evaluated as the conclusion of this research.

5.1   Summary of results

5.1.1 Summary of Hypothesis Testing

Test	Hypothesis	Results	Decision
POLS vs FEM	H_0 : There is a common intercept on all the companies H_1 : There is no common intercept on all the companies	0.0000	Reject H_0. FEM is appropriate.
POLS vs REM	H_0 : There is no random effect, $\sigma_i^2 = 0$. H_1 : There is random effect, $\sigma_i^2 \neq 0$	0.0000	Reject H_0. REM is appropriate.
FEM vs REM	H_0 : There is no correlation between firms individuals effect and $X_{i,t}$. H_1 : There has correlation between firm individual effect and $X_{i,t}$.	0.1797	Do not reject H_0. REM is appropriate.

5.1.2 Summary of Independent Variables

Independent Variables	Expected sign		Significant / insignificant	Hypothesis (Accept or Reject H_0)
Firm size	-	Inconsistent	Significant at 5%	Reject H_0
Liquidity	-	Inconsistent	Significant at 5%	Reject H_0
Profitability	-	Consistent	Insignificant	Accept H_0
Tangibility	+	Consistent	Insignificant	Accept H_0

5.2   Major Findings

In this research, the researchers examine the determinants that influence capital structure of GLCs in Malaysia. The researchers use the panel data of 30 annual reports from year 2010 to 2005.

5.2.1 Firm Size and Debt Ratio

Many studies discussed that firm size is one of the variables that will affect capital structure of GLCs. However, different firms have different management towards capital structure. Logically, larger firms need more capital in expanding and improving their business. Based on the result, firm size has negative relationship with debt ratio. According to Marsh (1982) due to a difficult obtain from the capital market, small companies tend to depend

more on financial institutions for the financial aids. The result is inconsistent with the earlier expected sign which is positive relation.

Firm size is significant variable in explaining the capital structure on firm's leverage ratio. Large GLCs are able to employ professionals to manage the firm's asset and budget planning. In this situation, requirement funds for bigger companies are lower compared to smaller companies. Decision making from the top management in the firms will give large effect on the capital structure. Moreover, the firms whether raise fund using equity or debt are depend on the budget planning of the top management.

Pecking order theory is one of the relevant theories suitable to explained firm size. The theory mentioned that firm size and debt ratio is negatively correlates because of asymmetric information are reduced in large firms (Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001). Large GLCs are less possible to underestimate equity than small firms. Therefore, large firms are possible using equity and be likely to have lower debt ratio (Lee & Hurr, 2009).

On the other hand, the insider understand the situation of the firm in capital market. Insider able to make final decision based on the firm's development and future prospects. Analyst will observe closely of large GLCs and therefore more capable issuing informational more on equity than debt. Frank and Goyal (2003), explain that profitable firms had significantly less leverage and this is support by pecking order theory. Overall, large firms are more liquid and tendency to bankrupt is smaller compared with small firms (Rajan & Zingales, 1995).

5.2.2 Liquidity and Debt Ratio

Based on the result from this research, the liquidity shows negative relationship to the debt ratio of GLCs in Malaysia which is inconsistent with the earlier expectation. Liquidity in this research is measured by using liquidity ratio which showed the firm's capability to meet their short term obligations. In this research, liquidity shows a negatively significant relationship towards debt ratio. This result is conformed to some previous study such as Suhaila et al. (2008), Ahmad and Rahim (2013) and Šarlija and Harc (2012). According to these studies, a firm with high liquidity have a tendency to use a lesser amount of leverage compared to other firms that have low liquidity. Furthermore, the result also indicates that firms with high liquidity are more likely to have lower liability in financing their operations which means they employ more current assets that are able to produce high cash inflows. Hence, the excess cash inflow can be used to finance their investment activities or business operations (Affandi, Mahmood & Ramli, 2013).

Besides, Wahab and Ramli (2013) stated that the liquidity and debt ratio results a significant and negative relationship which again proved that if GLCs obtain higher liquidity ratio, short term liability will indirectly reduce. The result also agreed by pecking-order theory (POT) which suggest fully utilized internal financing before seek for external financing (Pandey, 2001).

5.2.3 Profitability and Debt Ratio

The result reported insignificant relationship indicates that the hypothesis in earlier chapter was not supported. This result is inconsistent with previous findings (Twairesh, 2014; Putek et al., 2014; Serrasqueiro & Nunes, 2008; Nadaraja et al., 2011) who stated that the profitability has a significant impact towards debt ratio, yet it is consistent with Wahab and Ramli (2013) who also showed profitability and debt ratio have no relationship between each other. The insignificant effect might due to the different objectives of GLCs itself. From the result, it is obvious that these companies are more oriented in the provisions of service rather than profit making (Yegon et al., 2014). This argument is aligned with Deesomsak et al. (2004) concerning that the capital structure of state controlled firms in Singapore is unable affected by profitability.

Moreover, the negative sign indicates that the greater the profitability of a company, the lesser the debt ratio. This negative relationship result is matched with the expected sign. This confirms by the result from Ting and Lean (2011) and is supported by the pecking order theory. It might be applicable when GLCs earn higher profit, these companies lean towards raise fund through equity channel rather than seek for liability. This action indirectly decreases the level of debt financing in GLCs. Investors will attracted by a profit making GLCs since the profit turnover is higher and matched their preferences. Hence, it increases the ability of GLCs to pay off their previous debt (Ahmad & Rahim, 2013).

5.2.4 Tangibility and Debt Ratio

In this research, tangibility is influencing leverage positively but insignificantly which is consistent with past literatures like

Witwattanakantang (1999), Afza and Hussain (2011) and Mouamer (2011). Tangibility is positively related to debt, showing that firms tend to employ higher debt with higher tangible assets.

However, the insignificance of tangibility can be explained by the close relationship between firms and their lenders, only small amount of collateral is needed in order for them to borrow. Additionally, for Malaysian firms, this could also be resort to the comparatively deep level of government ownership (Deesomsak et al., 2004). Government ownership may reduce the cost of debt by conferring advantages such as governance benefits capital formation, preferential treatment by regulators and implicit bailouts of failing firms by the government (Shailer & Wang, 2015).

Optimal capital structure represents the best debt-to-equity ratios that magnify its value and diminish the cost of capital for a firm. The relationship reflected that firms with large asset structure benefit from tax shield favor debt financing, hence upholding the static tradeoff theory (Jamal et al., 2013). In this theory, due to its tax deductibility, debt financing offers the lowest cost of capital.

5.3   Implications

In this particular, the researchers investigated the determinants of capital structure in Malaysia. Researchers found that out of the four independent variables included in this research, only two independent variables which are firm size and liquidity significantly impact the capital structure of GLCs in Malaysia. Furthermore, this research finds that either profitability or tangibility has significant relationship with capital structure. This research might bring some implications towards government, managers of the firms and future researchers.

5.3.1 Government

This research provides government about the capital structure of Malaysian GLC. It helps government to evaluate and improve policies, regulations and institutional framework for corporate governance. Government can use this research as a reference on the new corporate governance policies and restructuring of existing corporate governance regulations in future.

Result from this research shows that firm size is significant impact on the capital structure. The result show that larger firms depend more heavily on debt financing. Besides that, large firm will have more influence in political constraints while small firms perceive that they will have less influence in political constraints. Thus, small firms are less influence than large firms in affecting government regulations. However, government may amend the current corporate governance legislations to strengthen the regulations in order to make sure that Malaysian firm performs better than the past.

Based on this research, the result shows that liquidity and debt is significant and negative relationship. This means that high liquidity firm relies heavily on equity financing than debt financing. Government may advise firm to finance its investment by using sufficient current assets. In short, when the firm own sufficient current assets, they can meet debt obligation efficiently without using debt financing.

5.3.2 Managers

From the findings, liquidity shows a negative and significant relationship with companies' capital structure. This further indicates that liquidity is an important element that managers always consider when they decide the formation of capital structure. High liquidity ratio signals that the firms have excess cash in order to settle short-term debt or able to carry out investment activities (Titman & Wessels, 1988). This result as suggested by pecking order theory (Mishra, 2011). As pecking order theory highlighted that companies with high liquidity are more prefer to use internal financing to start up their projects. Managers can create liquid reserves from retained earnings and this make no reason for GLCs to raise external funds since their liquid assets are sufficient.

Apart from that, the firm size which also showed negative and significant relationship with companies' capital structure also supported by pecking order theory but contradict with static trade off theory. According to Wahab and Ramli (2013), the negative relationship supported by pecking order theory that borrowing will be lesser in larger firm since such firm have stable operation which can apply loans more easier. This result will give manager some insight regarding that not necessary large firm have high debt ratio, it might be self-financing as well. This explanation suggested by Suhaila et al. (2008) stated that greater firm are less relies on leveraged financing compared to smaller firms.

5.3.3 Future Researchers

Lastly, this research also can contribute to future researchers. This is due to it provides wide- ranging and appropriate knowledge to future researchers. Since there are limited studies focusing on capital structure of government-linked companies in Malaysia, future researchers might gain theoretical and empirical knowledge through this research. Thus, they can contribute more details and wider research in this topic.

5.4   Limitations of the study

There are few limitations in this research. The first limitation of this research is that insignificance of various independant variables used in this research. Although the proxy variables used were significant in previous studies empirically and theoretically, they may not perfectly represent results in this research. It might due to differences in accounting periods and other factors of each country.

Besides, lack of independent variable is included in this research. There are four independent variables used in this research, which are firm size, liquidity, profitability and tangibility while debt acts as dependent variable. There might be some other independent variables can be used for this research. Different independent variables used might give different results.

There is also limitation of insufficient journals support that specifically study on Government-Linked Companies (GLCs) in Malaysia. Due to this reason, this research has referred to the journals that focus on other different sectors and countries instead of Malaysian Government-Linked Companies.

Last but not least, the various accounting formulas and calculation method such as those used in firm size may complicate this research in doing the ratio analysis. For example, there is confusion in determining the measurement of firm size as either log SALES or ln SALES. Another problem arises from the fact that the companies adopt different accounting period across companies, for example the year-end of few companies were previously 31 March and have changed to 31 December, which makes calculations difficult.

5.5   Recommendations for Future Research

Based on the limitations of study, there are several recommendations for future study. Firstly, based on the journals different ratios have different calculation methods. This research suggests to future research use the calculation method which most of the journals take it as theirs reference to avoid mix up with others ratios. Besides, using proper calculation method will obtain accuracy result and interpret in the correct way.

Secondly, with limitations as such, this research has lack of journals for Government-Linked Companies (GLCs) in Malaysia. In this case, future studies are recommended to produce more research on this topic. This is because, research can make the comparison between GLCs and non GLCs and the factors that will affect capital structure in different sectors or same sectors in Malaysia. Therefore, the research can study that whether the same variables have the same results or different results to affect capital structure in Malaysia.

Thirdly, additional relevant independent variables should be included into the future research to test the dependent variable of capital structure which is beneficial for management to make financial decisions. Hence, there were only five variables testing in this report so it is encouraged to future study to investigate on others related independent variables in affecting leverage such as economic growth, interest rate and cash flow in order to make the study more interesting.

Last but not least, future research control the limitation of financial report which has the different ending financial year in this research by choosing the financial report with the same ending financial year. For example, the study chooses the companies which have the financial year ending at 31 December only in the research. In the annual report, it is significant to have same ending financial year in order to obtain more reliable and accurate results.

5.6   Conclusion

The main purpose of this research is to investigate the determinant of capital structure over GLCs in Malaysia. The total 30 GLCs were taking into account in this research from the period of year 2010 to year 2015. In conclusion, this study proved that the firm size and liquidity have significant relationship with leverage. Based on the results, profitability and tangibility are consistent with the past researches. The research provide an insight to government, managers and future researchers in their decision making process. This research contributes to the ways on how government should act when face any problems and help investors to identify the importance of firm leverage ratio. There are some limitations and recommendations are discussed in this research for future study.

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LIST OF APPENDICES

Appendix 3.1: List of 30 Companies in Sample

List of GLCs in Malaysia		
1	AXIATA GROUP BERHAD	KHAZANAH
2	BOUSTEAD HEAVY INDUSTRIES	LTAT
3	BOUSTEAD HOLDINGS	LTAT
4	BURSA MALAYSIA BERHAD	MOF
5	CENTRAL INDUSTRIES CORP	PNF
6	CHEMICAL COMPANY OF MALAYSIA	PNF
7	FABER UEM	KHAZANAH
8	KLCC PROPERTY HOLDINGS BERHAD	PETRONAS
9	KPJ HEALTHCARE	JCORP
10	KULIM (MALAYSIA) BERHAD	JCORP
11	MISC BERHAD CORPORATION	PN
12	MAJUPERAK HOLDINGS BERHAD	PKN PERAK
13	MALAYSIA AIRPORTS HOLDINGS	KHAZANAH
14	MALAYSIA RESOURCES CORPORATION BERHAD	EPF
15	PASDEC HOLDINGS BERHAD	PKN PAHANG
16	PERAK CORPORATION BERHAD	PKN PERAK
17	PHARMANIAGA	LTAT
18	PETRONAS CHEMICALS GROUP BERHAD	PN
19	PETRONAS DAGANGAN BERHAD	PN
20	PETRONAS GAS BERHAD	PN
21	SIME DARBY	PNF
22	TDM	TERENGGANU INC.

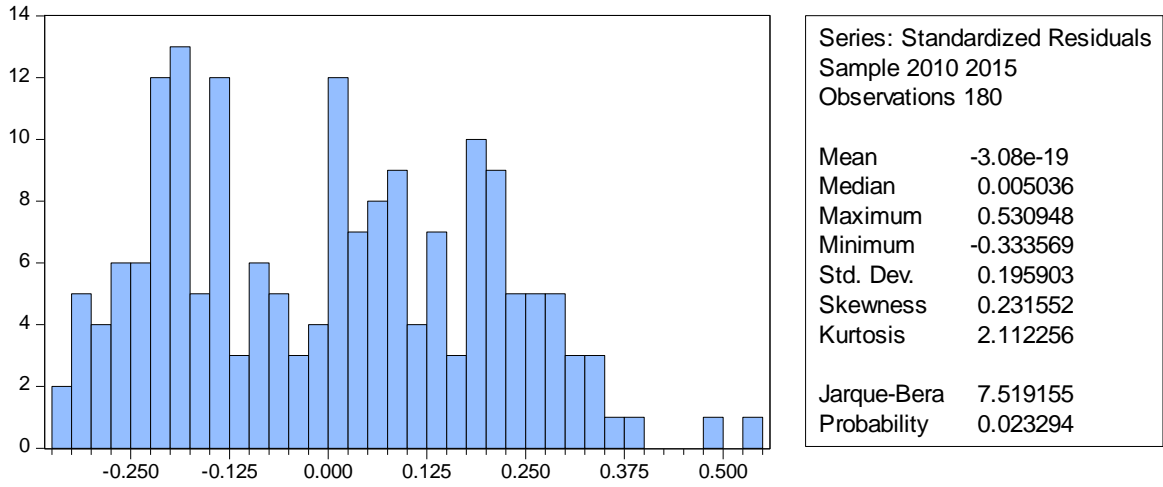| 23	TELEKOM MALAYSIA	KHAZANAH
24	TENAGA NASIONAL	KHAZANAH
25	THETA EDGE BERHAD	LTH
26	TH HEAVY ENGINEERING BERHAD	TH
27	TH PLANTATIONS BERHAD	LTH
28	TIME DOTCOM BERHAD	KHAZANAH
29	UMW HOLDINGS BERHAD	PNF
30	UMW OIL & GAS CORPORATION BERHAD	PN

Notes: JCORP=Johor Corporation; EPF=Employees Provident Fund; LTH=Lembaga Tabung Haji; LTAT=Lembaga Tabung Angkatan Tentera; PN=Petroliam Nasional; MOF=Minister of Finance Incorporated; PNF=Permodalan Nasional & Fund.

Appendix 3.2: List of Company's Annual Report

1. Axiata Group Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

2. Boustead Heavy Industries Corporation Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

3. Boustead Holdings Berhad. (2010-2015). *Annual report.* Kuala Lumpur, Malaysia.

4. Bursa Malaysia Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

5. Central Industries Corporation Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

6. Chemical Corporation Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

7. Faber UEM Edgenta Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

8. KLCC Property Holdings Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

9. KPJ Healthcare Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

10. Kulim (Malaysia) Berhad). (2010-2015). *Annual report*. Johor, Malaysia.

11. MISC Corporation Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

12. Majuperak Holdings Berhad. (2010-2015). *Annual report*. Perak, Malaysia.

13. Malaysia Airports Holdings Berhad. (2010-2015). *Annual report*. Selangor, Malaysia.

14. Malaysia Resources Corporation Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

15. Pasdec Holdings Berhad. (2010-2015). *Annual report*. Pahang, Malaysia.

16. Perak Corporation Berhad. (2010-2015). *Annual report*. Perak, Malaysia.

17. Pharmaniaga Berhad. (2010-2015). *Annual report*. Selangor, Malayisa.

18. Petronas Chemical Group Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

19. Petronas Dagangan Berhad. (2010-2015). *Annual report*. Melaka, Malaysia.

20. Petronas Gas Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

21. Sime Darby Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

22. Terengganu Incorporated Berhad. (2010-2015). *Annual report*. Terengganu, Malaysia.

23. Telekom Malaysia Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

24. Tenaga Nasional Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

25. Theta Edge Berhad. (2010-2015). *Annual report*. Selangor, Malaysia.

26. TH Heavy Engineering Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

27. TH Plantations Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

28. Time Dotcom Berhad. (2010-2015). *Annual report*. Selangor, Malaysia.

29. UMW Holdings Berhad. (2010-2015) *Annual report*. Selangor, Malaysia.

30. UMW Oil & Gas Corporation Berhad. (2010-2015). *Annual report*. Kuala Lumpur, Malaysia.

Appendix 4.1: Normality Test

Series: Standardized Residuals	
Sample 2010 2015	
Observations 180	
Mean	-3.08e-19
Median	0.005036
Maximum	0.530948
Minimum	-0.333569
Std. Dev.	0.195903
Skewness	0.231552
Kurtosis	2.112256
Jarque-Bera	7.519155
Probability	0.023294

Appendix 4.2: Descriptive Analysis from EViews

	DEBT_RATIO	FIRM_SIZE	LIQUIDITY	PROFITABILITY	TANGIBILITY
Mean	0.339323	7.443058	6.597461	1.987040	0.660438
Median	0.343684	6.529275	1.270850	0.071625	0.717380
Maximum	0.906700	59.76690	126.4576	10.65772	0.975608
Minimum	0.002015	0.562923	0.031900	1.18E-05	0.044354
Std. Dev.	0.225041	7.374896	18.78547	3.629438	0.212991
Skewness	0.209327	4.818361	4.806873	1.428468	-0.756972
Kurtosis	1.948651	29.40004	27.62307	3.157063	2.811249
Jarque-Bera	9.604546	5923.716	5240.397	61.40067	17.45739
Probability	0.008211	0.000000	0.000000	0.000000	0.000162
Sum	61.07809	1339.750	1187.543	357.6671	118.8789
Sum Sq. Dev.	9.065177	9735.649	63168.01	2357.935	8.120403
Observations	180	180	180	180	180

Appendix 4.3 Panel Data Regression Analysis: Ordinary Least Square (OLS)

Dependent Variable: DEBT_RATIO
Method: Panel Least Squares
Date: 05/30/16   Time: 23:06
Sample: 2010 2015
Periods included: 6
Cross-sections included: 30
Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIRM_SIZE	-0.006358	0.002022	-3.144675	0.0020
LIQUIDITY	-0.004855	0.000791	-6.139210	0.0000
PROFITABILITY	-0.012700	0.004120	-3.082958	0.0024
TANGIBILITY	0.062699	0.070508	0.889255	0.3751
C	0.402503	0.050149	8.026134	0.0000

R-squared	0.242194	Mean dependent var	0.339323
Adjusted R-squared	0.224873	S.D. dependent var	0.225041
S.E. of regression	0.198129	Akaike info criterion	-0.372412
Sum squared resid	6.869643	Schwarz criterion	-0.283719
Log likelihood	38.51708	Hannan-Quinn criter.	-0.336451
F-statistic	13.98247	Durbin-Watson stat	0.647393
Prob(F-statistic)	0.000000		

Appendix 4.4 : Panel Data Regression Analysis: Fixed Effect Model (FEM)

Dependent Variable: DEBT_RATIO
Method: Panel Least Squares
Date: 05/30/16   Time: 23:09
Sample: 2010 2015
Periods included: 6
Cross-sections included: 30
Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIRM_SIZE	-0.003327	0.002073	-1.604988	0.1107
LIQUIDITY	-0.001163	0.000729	-1.594620	0.1130
PROFITABILITY	-0.004049	0.014300	-0.283148	0.7775
TANGIBILITY	0.031738	0.065510	0.484483	0.6288
C	0.358840	0.059111	6.070627	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.850721	Mean dependent var	0.339323
Adjusted R-squared	0.816980	S.D. dependent var	0.225041
S.E. of regression	0.096274	Akaike info criterion	-1.674803
Sum squared resid	1.353236	Schwarz criterion	-1.071689
Log likelihood	184.7323	Hannan-Quinn criter.	-1.430266
F-statistic	25.21326	Durbin-Watson stat	2.306127
Prob(F-statistic)	0.000000		

Appendix 4.5 : Panel Data Regression Analysis: Random Effect Model (REM)

Dependent Variable: DEBT_RATIO
Method: Panel EGLS (Cross-section random effects)
Date: 05/30/16   Time: 23:10
Sample: 2010 2015
Periods included: 6
Cross-sections included: 30
Total panel (balanced) observations: 180
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIRM_SIZE	-0.003918	0.001903	-2.059257	0.0410
LIQUIDITY	-0.001690	0.000687	-2.458798	0.0149
PROFITABILITY	-0.010167	0.007824	-1.299473	0.1955
TANGIBILITY	0.024003	0.061473	0.390469	0.6967
C	0.383986	0.058234	6.593814	0.0000

Effects Specification

			S.D.	Rho
Cross-section random			0.179834	0.7772
Idiosyncratic random			0.096274	0.2228

Weighted Statistics

R-squared	0.065565	Mean dependent var	0.072451
Adjusted R-squared	0.044206	S.D. dependent var	0.099113
S.E. of regression	0.096897	Sum squared resid	1.643093
F-statistic	3.069722	Durbin-Watson stat	1.833502
Prob(F-statistic)	0.017845		

Unweighted Statistics

R-squared	0.165364	Mean dependent var	0.339323
Sum squared resid	7.566126	Durbin-Watson stat	0.591687

Appendix 4.6 : Poolability Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	20.522844	(29,146)	0.0000
Cross-section Chi-square	292.430382	29	0.0000

Cross-section fixed effects test equation:
Dependent Variable: DEBT_RATIO
Method: Panel Least Squares
Date: 05/30/16   Time: 23:14
Sample: 2010 2015
Periods included: 6
Cross-sections included: 30
Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIRM_SIZE	-0.006358	0.002022	-3.144675	0.0020
LIQUIDITY	-0.004855	0.000791	-6.139210	0.0000
PROFITABILITY	-0.012700	0.004120	-3.082958	0.0024
TANGIBILITY	0.062699	0.070508	0.889255	0.3751
C	0.402503	0.050149	8.026134	0.0000

R-squared	0.242194	Mean dependent var	0.339323
Adjusted R-squared	0.224873	S.D. dependent var	0.225041
S.E. of regression	0.198129	Akaike info criterion	-0.372412
Sum squared resid	6.869643	Schwarz criterion	-0.283719
Log likelihood	38.51708	Hannan-Quinn criter.	-0.336451
F-statistic	13.98247	Durbin-Watson stat	0.647393
Prob(F-statistic)	0.000000		

Appendix 4.7 : Breusch-Pagan Lagrange Multiple Test (BPLM)

Lagrange multiplier (LM) test for panel data
Date: 05/30/16   Time: 23:05
Sample: 2010 2015
Total panel observations: 180
Probability in ()

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	228.7165 (0.0000)	0.507606 (0.4762)	229.2241 (0.0000)
Honda	15.12338 (0.0000)	-0.712465 (0.7619)	10.19005 (0.0000)
King-Wu	15.12338 (0.0000)	-0.712465 (0.7619)	5.141555 (0.0000)
SLM	16.48390 (0.0000)	-0.486047 (0.6865)	-- --
GHM	-- --	-- --	228.7165 (0.0000)

Appendix 4.8 : Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.272456	4	0.1797