THE EFFECT OF CAPITAL STRUCTURE ON FIRM'S PERFORMANCE: EVIDENCE FROM MALAYSIAN CONSTRUCTION INDUSTRY

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ABSTRACT

The main objective of this study is to examine the effect of capital structure on firm's performance specifically focusing on the Malaysian construction firms. This study also attempted to highlight the theories of capital structure that closely related to the Malaysian construction firms. This study uses 21sample firms listed on the Main Market of Bursa Malaysia with at least 10 years trading experience. The period of study is 7 years (2009-2015). A few series of regressions has been conducted and the final results are reported based on fixed effect model with robust standard error. The findings show that all variables; long term debt, total debt, size and sales growth have an effect on firm's performance except the short term debt. The long term debt and sales growth have a positive relationship with firm's performance. The results indicate that an increase in the long term debt and sales growth are associated with an increase in the firm's profitability. Meanwhile, the total debt and size show a negative and significant relationship with firm's performance. Therefore, the negative relationship between debt and firm's performance is fits the trade-off theory. The trade-off theory explains that overleverages firm's capital structure will cause the difficulties to meet the interest payment obligation which later would jeopardise the firm's value.

Keywords: capital structure, construction firms, firm's performance, trade-off theory

ABSTRAK

Objektif utama kajian ini adalah untuk mengkaji kesan struktur modal ke atas prestasi firma khususnya kepada syarikat pembinaan Malaysia. Kajian ini juga cuba untuk mengetengahkan teori-teori struktur modal yang berkait rapat dengan firma-firma pembinaan Malaysia. Kajian ini menggunakan 21 contoh firma yang disenaraikan di pasaran utama Bursa Malaysia dengan sekurang-kurangnya 10 tahun pengalaman dagangan. Tempoh kajian ini adalah 7 tahun (2009-2015). Beberapa siri regrasi model telah dijalankan dan keputusan akhir dilaporkan berdasarkan *robust fixed effect model.* Hasil kajian menunjukkan bahawa semua pembolehubah; hutang jangka panjang, jumlah hutang, saiz and pertumbuhan jualan mempunyai kesan ke atas prestasi firma kecuali hutang jangka pendek. Hutang jangka panjang dan pertumbuhan jualan mempunyai hubungan positif dengan prestasi firma. Keputusan menunjukkan peningkatan pertumbuhan jualan dan hutang jangka panjang adalah berkaitan dengan peningkatan dalam keuntungan firma. Sementara itu, jumlah hutang dan saiz menunjukkan hubungan yang negatif dan signifikan dengan prestasi firma. Oleh itu, hubungan negatif antara hutang dan prestasi firma adalah sesuai dengan teori *trade-off.* Teori *trade-off* menjelaskan struktur modal firma yang menggunakan terlalu banyak hutang akan menyebabkan kesukaran untuk memenuhi kewajipan pembayaran faedah yang kemudiannya akan menjejaskan nilai firma.

Kata kunci: struktur modal, firma pembinaan, prestasi firma, teori *trade-off*

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ROA	Return on assets
STD	Short term debt
LTD	Long term debt
TD	Total debt
TOT	Trade-off theory
POT	Pecking order theory
ACT	Agency cost theory
MM	Modigliani and Miller
GDP	Gross Domestic Product
GST	Good and Service Tax
CIDB	Construction Industry Development Board
BNM	Bank Negara Malaysia

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Studies on capital structure are one of the most critical areas in academia as well as in industries around the globe. Generally, capital structure is referred to the firm's financing decision that used to support the firm's daily operation. In other words, capital structure is firm's capital that primarily obtained either from debt or equity. There are few sources of debt that preferably used such as bonds and banks borrowing. Meanwhile, sources of equity include common stocks and preferred stocks. As the firm expands it needs more capital in order to support the expansion. Thus, financing decision plays an important role in helping a firm to achieve better performance.

Since firm's financial decision is directly related to its risk and return, the firm has to make sure that it chooses the right capital structure. Implementing immature capital structure leads to high cost of capital, which decreases the firm's value. On the contrary, choosing the right capital structure increases the firm's value. Later, it helps firm to deal with the competitive environment (Ahmad, Abdullah & Roslan, 2012).

Many modern theories related to the capital structure have been introduced by different scholars like Modigliani and Miller (1958), Modigliani and Miller II (1968), agency cost theory (1976), trade-off theory (1977) and pecking order

theory (1984). The Pecking order theory explains that firm first raises its capital internally, perhaps by using the firm's retained earnings. Secondly, the firm uses debt when it needs an additional funding. Equity is only used as a last resort when the firm really needs a capital injection in order to support its operation (Coleman & Robb, 2012). In short, the pecking order theory suggests that a firm with high earning or profit is expected to use less debt compared to the firm with lower earnings.

Trade-off theory explains about the optimal capital structure. The optimal capital structure conceptualized the trade-off between the cost of debt financing and the benefits of debt financing that borne by a firm based on its financial decision. The benefit of debt refers to the interest tax shield. In addition, the costs of debt are referring to the financial distress and agency cost. Hence, it is crucial for the financial manager to make a right decision on the firm's capital structure. The manager needs to consider all the possible effects that will be faced by the firm based on his/her decision either enjoying the tax shield or suffering the losses (bankruptcy).

Moreover, in order to be able to compete with other rivals in the competitive environment, the firm must have a good performance. The decision made in business financing definitely will give an impact to the firm's performance. There are few cases that when the firms use more debt to support their operation, then the performance are better. However, it is also some cases where the deployment of huge debt has jeopardies the firm's performance due to the failure to serve the debt. Therefore, it is important to a financial manager to look at the

firm's financial policies and also the existing capital structure before making any decision towards the firm's capital structure.

1.1 Background of the Study

This section discusses the impact of capital structure on firm's performance, Malaysian economic outlook and Malaysian construction industry. The details are as follows.

1.1.1 Performance and Capital Structure

The main objective of conducting a business is definitely to gain profit from the invested capital. Nevertheless, financial management stresses the importance of maximizing the shareholders' wealth as the main intention of a firm. Shareholder wealth or shareholder value is the value delivered to the shareholders based on the management's ability to earn more. There are two main drivers that increase the shareholders' value; (1) wise investment decision and (2) generates a positive return from the invested capital.

Firm's performance can be measured by an accounting base measurement like return on asset (ROA), return on equity (ROE), net profit margin (NPM) and gross profit margin (GPM). Additionally, based on the market base measurement performance can be measured by earning per share (EPS), share price (P) and Tobin's Q. These ratios are widely used in previous researches as proxies to the firm's performance (for instance Khanam, Nasreen &

Pirzada, 2014; Hasan, Ahsan, Rahaman & Alam, 2014; Sheikh & Wang, 2013; Khan, 2012; Chowdhury & Chowdhury, 2010; Zeitun & Tian, 2007).

Firm's performance and firm's financing decision cannot be segregated from each other. The firm's financing decision actually gives a huge impact on the firm's performance. The decision of using debt, equity and retained earnings on firm's capital structure later will reflect the firm's performance. There are two major external sources which are debt and equity. According to Kochhar (1997), debt holders and equity holders are firm's investors. These two investors are associated with different levels of benefit, control and risk. Therefore, in order to make a decision regarding the firm capital structure a financial manager needs to take into account the consequences that the firm will face later.

According to Sahudin et al. (2011), many firms prefer using debt instead of equity financing due to the reason of tax deductibility. Nonetheless, the cost of bankruptcy puts limits to the tax benefit. Even though a number of firms prefer to use debt, there are still a number of firms prefer to use equity as a source of financing. Furthermore study from Tse and Rodgers (2014) cited from Kim (1997), the mixture of debt and equity financing has been found to vary from industry-to- industry and it even differs from country-to-country.

A study conducted by Sahudin et al. (2011) states that construction firms in Malaysia use more debt compared to equity as they are getting larger. As firms get bigger and need more capital injection, their financing decisions

become critical. Selecting the right source of financing helps them to improve their performances. Otherwise, making the wrong decision harms the firm's performance. Thus, it is interesting to study the effect of capital structure on the firm's performance specifically on Malaysian construction firms.

1.1.2 Malaysian Economic Outlook

Experiencing strong economic growth for a few decades ago has put Malaysia within sight of achieving high-income status. Based on Figure 1.1, Malaysian economy enjoys 6 percent annual growth in 2014 and drops to 5 percent in 2015 due to the strong economy headwinds. The depreciation of the currency, political instability and the collapse of revenue related to the oil and gas sector are factors that contributed to the declining of Malaysian GDP in 2015. Apart from that, the introduction of goods and services tax (GST) in April 2015 also contributes to slower economic growth in Malaysia. Nonetheless, the 5 percent growth in 2015 was actually expanded above the market expectation (which is only at 4.3 percent). This stronger-than-expected performance is driven by factors like strong consumption growth and few other factors.

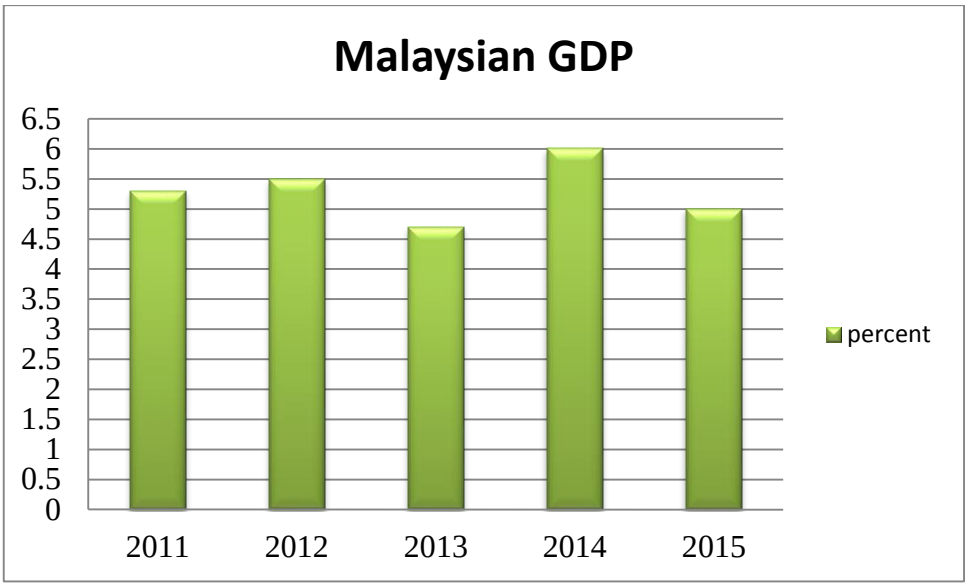

Figure 1.1
Malaysian GDP from 2011 to 2015
Source: Asian Development Bank

1.1.3 Construction Industry in Malaysia

Table 1.1 shows the growth of Malaysian GDP contributes by different sectors include service, manufacturing, mining and quarrying, agriculture and construction.

Table 1.1
GDP contribution by Industry in 2014

Industry	Contribution to Gross Domestic Product (GDP) in 2014 (%)
Service	55.3
Manufacturing	24.6
Mining & Quarrying	7.9
Agriculture	6.9
Construction	3.9
Real Gross Domestics Product (GDP)	100

Source: Department of Statistic Malaysia

According to Yee and Mustaffa (2012), for the past 20 years, the construction industry contributed significantly to the Malaysian economic growth. This industry enriches the life's quality by offering the essential socioeconomic infrastructure like schools, roads, hospitals, parks, commercial space, health care unit, stadiums, highways, railways and other basic facilities in the country (Rahman, Memon & Karim, 2013).

Table 1.1 shows the construction industry contributes 3.9 percent, which equals to RM 33 billion of total Malaysian GDP in 2014. The output of the construction industry is relatively small compared to the other industries like services and manufacturing. This condition has been stressed by Ibrahim, Roy, Ahmed and Imtiaz (2010) in their study related to the status of the Malaysian construction industry. Although construction industry contributes

less than 5 percent to the total GDP, it remains one of the largest in terms of job creation for the Malaysian landscape. In 2014, construction industry engages more than 1 million people that representing about 6.2 percent of the total workforce (Construction Industry Development Board, 2015). Sahudin et al. (2011) claimed that aside generating wealth for the country, the construction industry also plays an essential role in providing the job opportunities to workers particularly both to the semi-skilled and unskilled workers. Furthermore, this industry also creates a multiplier effect on other sectors like manufacturing and financial services via backward and forward linkages (Ibrahim et al., 2010).

Table 1.2
GDP contributors in 2015 (4th quarter)

Industry	Contribution to Gross Domestic Product (GDP) in 2015 (4th quarter) (%)
Service	5.6
Manufacturing	5.5
Mining & Quarrying	2.8
Agriculture	3.1
Construction	10.7

Source: Department of Statistic Malaysia

Table 1.2 shows the percentage of the sector's contribution to Malaysian GDP in the fourth quarter of 2015. The construction industry contributes at least 10.7 percent and it considers as the main contributor to the Malaysian

GDP for the fourth quarter of 2015. However, the overall percentage contributed by the construction industry in 2015 is still the lowest compared to others like manufacturing and services. After all, the importance of this industry cannot be ignored because it grants huge support to the Malaysian economy by interconnection with other industry (Khan, Liew & Ghazali, 2014).

1.2 Problem Statement

Studies on capital structure are a long history from its classical theory till the modern theory. Moreover, the were also many studies has been conducted related to the determinants of capital structure. Aside from that, (Akeem, Terer, Kiyanjui & Kayode, 2014; Salim & Yadav, 2012; Gill, Biger & Mathur, 2011; Salawu, 2009; Ebaid, 2009; Tapanjeh, 2006 Abor, 2005) have studied the effect of capital structure on firm's performance.

Many studies related to the effect of capital structure on the firm's performance have been conducted in emerging countries including Malaysia. However, in Malaysian landscape, only a few studies have been focused on the construction industry (for instance Sahudin et al., 2011). Therefore, it is essential to have further studies in this area since the construction industry also has some contributions to Malaysian economic growth.

Although there are a number of studies on the effect of capital structure on the firm's performance having conducted, most of them did not focus only on one sector. For example, Salim and Yadav (2012) conducted a study on 237

Malaysian listed companies from 1995 till 2011 without considering their industries differences. The results are mixed; where capital structures are negatively affecting the firm's return on assets and return on equity. Somehow rather, Tobin's Q has a strong positive relationship with firm's capital structure. Therefore, by pooling or combining all firms under a big umbrella by neglecting its real category may produce a questionable finding. Thus, it is considered inappropriate to make a general conclusion based on the findings. Furthermore, it is important to note that different industries adopt different financing strategies.

In addition, even though there are a number of studies about the effect of capital structure on firm's performance, their results are inconclusive. Some studies found a negative and significant relationship between capital structure and firm's performance (for example Hasan et al., 2014; Akeem et al., 2014; Ahmad et al., 2012). Conversely, some studies (see Gill et al., 2011; Tapanjeh, 2006; Abor, 2005) found a significant and positive relationship between capital structure and firm's performance. Moreover, there were also studies that revealed insignificant relationship between firm's capital structure and its performance (Ebaid, 2009). Thus, these inconclusive results create gaps that require more studies related to this issue.

1.3 Research Questions

As referring to the above problem statement, this study raises questions related to capital structure, firm performance, the relationship as well as the theories that associated with the Malaysian construction industry. The questions discuss in detail as follows.

1. What is the effect of capital structure on firm's performance for the Malaysian construction firms?
2. Which theory/ies is/are most relevant that relates to the Malaysian construction firm's capital structure?

1.4 Research Objectives

The objectives of this study include:

1. To examine the effect of capital structures on firm's performance for Malaysian construction firms.
2. To highlight the theories of capital structure closely related to the Malaysian construction companies.

1.5 Significance of the Study

This study is expected to significantly contribute something for firms, investors and researcher and academicians.

- Firm

The adoption of sound and good capital structure is a crucial thing that a firm needs to do. As with operating decision, financial managers have to make capital structure communicates with low cost of capital reflected by low weighted average cost of capital (WACC). The lower WACC is designed to maximize the firm's value. Therefore, this study is expected to give a significant contribution to the firm to plan an optimal capital structure which later able to maximize the firm's value.

- Investors

The selection of source financing (capital structure) is influencing the risk of investors. Too much use of debt able to put a firm in bad financial condition. Generally, the investors or stockholders are nervous and worries when the firm increases the debt because it increases the value of the interest. This situation causes the decreases in earnings per share (EPS) due to the low stocks price. In a worse situation where the firm goes into bankruptcy, the shareholders are the last to be paid. Hence, this study is expected to help the investors to plan better strategies when it comes with that kind of situation.

- Researcher and academicians

The study about the effect of capital structure on the firm's performance, especially in the construction industry is very limited. It is important to expand the study on that industry because it contributes at least 3-5 percent of Malaysian economic growth for few decades ago. Therefore, this study is expected to provide useful information to other future researchers and academicians who intend to conduct a research in the same area as this study.

1.6 Scope of the Study

The main purpose of conducting this study is to investigate the effect of capital structure on the firm's performance for Malaysian construction firms. This study covers a 7-year period of study from 2009 till 2015 with 21 construction firms that currently listed on the Main Market of Bursa Malaysia.

1.7 Organization of the Study

This study is organized into five chapters. Chapter one covers the background of the study, problem statement, research questions, research objectives, the scope of the study and significance of the study. The following chapter discusses the theories and empirical findings related to the capital structure and its impact on the firm's performance. Chapter three discusses the methodology, variables, theoretical framework and models that use in this study.Chapter four presents the findings and analysis. The last chapter describes the summary, limitations and recommendations from this study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This study aims to examine the effect of capital structure on the firm's performance of Malaysian construction firms. Prevailing theories that use to explain the capital structure are discussed in this chapter. Apart from that, this chapter also discusses the past empirical evidence about the impact of capital structure on the firm performance. Specifically, section 2.2 presents the theories of capital structure and section 2.3 critically reviews the past empirical studies related to the impact of capital structure on the firm's performance.

2.1 Theoretical Literature

According to Ahmad et al. (2012), there are few theories related to the capital structure has been revealed. However, neither old theories nor modern theories of capital structure can explain the real picture of the employment of capital structure in the business world. In addition, each theory works under its own proposition and assumption. Among the theories include Modigliani and Miller (MM), trade-off theory (TOT), pecking order theory (POT) and agency cost theory (ACT).

2.1.1 Modigliani and Miller (MM)

Sahudin et al. (2011) pointed out that, studies on the theories of capital structure have a long history where it has started since 1958 by Modigliani and Miller (MM). Based on the MM theory, scholars suggest that firm's value is not affected by its financing mix. In addition, MM proposition also assumes that in perfect market condition, firm's capital structure and financing decisions do not affect either cost of capital or firm's value (Karadeniz, Kandir, Balcilar and Onal (2009). MM theory has been criticized by many other scholars since it contradicts the real world implementation where the firm value is affected by the way a firm finances its operation.

In 1963, the MM theory has been revised. The Modigliani and Miller II (MM II) proposition includes the effect of taxes on debt financing. MM II suggests that the vital characteristic of taxation is the recognition of interest as tax deductible expenditure (Coleman, 2007). Therefore, the tax deductibility of interest makes debt financing more valuable under MM II proposition. MM II strengthens the argument by explaining, firm that enjoys the tax shield in nature pays a lower tax. Therefore, the tax advantage of debt financing has motivated the optimal capital structure theory. The firm may reach the optimal capital structure and increase its market value by altering its capital structure. Even though the MM theory is amended, it is criticized due to some weakness and irrelevance assumption of the real world situation.

2.1.2 Agency Cost Theory (ACT)

The agency cost theory is developed by Jensen and Meckling in 1976. There are two types of agency problem which are; 1) agency cost of equity; 2) agency cost of debt (Hasan et al., 2014). Ahmad et al., (2012) stated, the agency cost problem exist when there are conflicts between stockholders and firm's managers and also the conflict between shareholders and debtholders. Moreover, in certain situation the given incentives to the firm are looking as benefits to shareholders that actually expense to the debtholders. Thus, debtholders need to take an action by confining and monitoring the firm's behaviour. Subsequently, in order to protect the debtholders, high cost is incorporated. Hence, it increases the firm's cost of capital. Consequently, firm that relatively faces higher agency cost should have lower levels of debt financing.

2.1.3 Trade-off Theory (TOT)

According to Karadeniz et al. (2009), agency cost by Jensen and Meckling (1976) and bankruptcy cost by Myers (1977) are the backbones of the development of the trade-off theory (TOT). Generally, managers would set a target on how much debt would be used by the firm in order to trade-off the tax advantages and the cost of bankruptcy (J. Glover & Hambucsh, 2014; Gottrdo & Moisello, 2011). According to Haron (2014), the trade-off between cost and benefits of the firm's leverage assist the firm to achieve the optimal capital structure. For example, the implementation of long term debt is determined by the trade-off between risk of bankruptcy and the benefits of

tax savings. Long term debt is associated with interest expense where it is tax deductible. Thus, the more debt use by the firm the more wealth would be created due to the lower tax payment. Having said that, as more debt is used the tax shield will also be increased and the firm value also increases (Stretcher & Johnson, 2011). However, overleveraging may put the firm into financial distress. The large proposition of debt causes the difficulties to meet the interest payment obligation. Therefore, this condition could jeopardise firm's value. Somehow, Tse and Rodgers (2014) state that debt financing is potentially used as to control the agency cost because it able to reduce the free cash flow and inspire the supervising of management by debt providers.

2.1.4 Pecking Order Theory (POT)

Pecking order theory (POT) is developed by Myers in 1984. According to Haron (2014), POT is an alternative to the TOT. POT emerges based on the asymmetric information between outside investors and inside investors that cause the firm's financial hierarchy. Tse and Rodgers (2014) state, under POT; firms have a very clear preference in their sources of funding where they prefer to use internal funds rather than the external funds. Moreover, despite using equity as a second alternative, firms normally prefer to use debt rather than equity. Equity is issued only when firms have no more debt capacity (Haron, 2014). Thus, pecking order theory suggests there is a negative relationship between the firm's earning and debt financing where the most profitable firms use less external borrowing. This statement is supported by Principe (2015) with an argument that most firms with a medium - high

level of profitability are more favourable to use internal finance which simultaneously reduced the usage of external finance.

2.2 Empirical Literature

There are many factors that notably affected the firm's performance. One of them is capital structure. Previously, many empirical studies have been conducted in order to investigate if there were any relationship between capital structure and firm's performance. The results of these studies are mixed.

Abor (2005) employed a sample of 22 Ghanaians firms during 1998 till 2002 and found a negative and significant relationship between long term debt and return on equity. However, short term debt and total debt have shown a positive and significant relationship with profitability. The positive relationship suggests that an increase in debt position is associated with an increase in firm's profitability. He further argues that short term debt is relatively less expensive which leading to an increase in firm's profit level. The study also revealed both of size and sales growth have a positive relationship with profitability.

Similar results also found by Gill et al. (2011). They studied the effect of capital structure on profitability of 272 American services and manufacturing firms from 2005 till 2007. The study used ROE as an indication of firm's profitability. They found that capital structure significantly affected the firm's performance. In the service industry, short term debt and total debt show a positive and significant relationship with profitability. Moreover, capital structure (like short term debt, long term debt and total debt) shows a positive relationship with firm's profitability in the manufacturing industry.

Utilizing panel data consisting of 167 Jordanian firms over a 12-year period of study from 1998-2009, Zeitun and Tian (2007) examined the effect of capital structure on corporate performance. Researchers employed Random Effect Model regression and found a negative relationship between capital structure (short term debt, long term debt and total debt) with the firm's performance (return on assets). Similar results reported by (Salim & Yadav, 2012; Sheikh &Wang, 2013). They concluded that all variables proxies to capital structure have a negative impact on the firm's performance. In addition, higher level of debt leads to lower returns on assets. They suggested this circumstance happened due to the agency conflicts, company over-leveraging themselves, hence affecting their performance inversely.

Moreover, Ebaid (2009) employed return on assets, return on equity and gross margin as proxies to the firm performance. The study utilized 64 Egyptian firms with 9 year period of study (1997-2005) found that capital structure (short term and total debt) negatively affected firm's performance measured by return on assets. However, capital structure measured by short term debt, long term debt and total debt has no significant effect on firm performance measured by return on equity and gross margin. In sharp contrast, Salawu (2009) found that all variables proxies to capital structure (like short term debt, long term debt and total debt) was insignificantly affected return on assets.

Alternatively, Ong and Teh (2011) employed the data of 49 construction companies listed on Bursa Malaysia from 2005 to 2008 found that different proxies of capital structure respond differently to the different proxies of firm's corporate performance. The study used both of accounting base and market base measurement of the firm's performance. Besides, the study also splatted the firms

into three categories like big, medium and small firms. For big construction companies only return on capital and earnings per share reported to have a significant relationship with capital structure. Meanwhile, for medium construction companies, only the operating margin has a significant relationship with capital structure. Additionally, for small Malaysian construction companies, only earnings per share have a significant relationship with capital structure. Thus, different types of companies have different response to the firm's capital structure. Besides, this study also found a significant positive relationship between firm's size and profitability and also between growth and profitability. This finding is contradicted to Hasan et al. (2014) who was found a negative and significant relation between size and firm's performance.

In another study, Ahmad et al. (2012) employed both return on assets and return on equity as proxies to the firm's performance. The study also used short term debt, long term debt and total debt as to indicate the capital structure. Additionally, the firm's size, asset growth, sales growth and efficiency were used as control variables. Their study covers two sectors in Malaysia which are consumer sector and industrial sector. By employing 58 firms with 6 year period of study (2005-2010), the study found that short term debt and total debt have a negative relationship with return on assets. The results are parallel with (Khan, 2012; Sheikh & Wang 2013; Hasan et al., 2014). In contrast, long term debt reported as positively significant to return on assets. It explained that the higher level of performance might be contributed by the advantages of tax shield of interest and also the disciplinary role imposed by an increase in long term debt diminished the agency cost. As same with Abor (2005) capital structure however reported as significantly affected return on equity with a negative sign. However,

the growth shows insignificant relationship with return on assets. It explains that growth does not have any significant effect on the firm's performance. It is contradicted with Salim and Yadav (2012) who found a positive and significant relationship between growth and firm's performance.

Moreover, Soumadi and Hayajneh (2012) conducted a study with an aim to investigate the effect of capital structure on the firm's performance for Jordanian firms. The study employed 66 firms with periods of study from 2001-2006 using pooled ordinary least square regression found that capital structure is negatively associated with firm performance. The negative result indicates that firm which finance their activities by increasing firm's leverage result the excessive in borrowing leads to emerge of bankruptcy risk that tend to minimize the firm's performance.

Khanam et al. (2014) studied on 49 food companies in Karachi Stock Exchange from 2007 till 2012 using panel data found a negative and significant relationship between long term debt and return on assets. Aside from that, total debt also reported as negatively affected the firm's return on assets. Although a negative relationship between debt and the firm's profitability is not in accordance with the trade-off theory and agency theory, it is consistent with pecking order theory developed by Myers and Majluf (1984). This finding supported studies like (Dawar, 2014; Akeem et al., 2014). This study however revealed that short term debt does not have a significant impact on the firm's performance.

Latest, Yazdanfar and Ohman (2015) conducted a 6-year period of study from 2009 till 2012 using Swedish SMEs firm found that capital structure is negatively associated to return on assets. Researchers pointed out that short term debt has

significantly affected firm's performance with negative sign which means that increase in short term debt associated to decrease in return on assets. In addition, they also found that firms with a lower debt ratio are more profitable. This finding in the line with agency cost theory. Furthermore, managers of SMEs firms were advised to use the equity and retained earnings efficiently, thereby reducing the agency costs and endured independent of external financiers. Aside from that, this study also found a significant positive relationship between firm's size and return on assets. Analogous results also were observed by (Ahmad et al., 2012; Salim & Yadav, 2012; Dawar, 2014). They all concluded that larger firms earn a higher return compared to smaller firms, apparently as a result of economies of scale and diversification of investment.

All in all, previous studies have provided much information related to the firm's performance as well as the capital structure. Past studies showed the inconclusiveness in their final result about the relationship between capital structure and firm's performance. Following the past studies, this study use return on assets as dependent variable. Short term debt, long term debt and total debt are used as explanatory variables. In addition, size and growth use as the control variables. This study attempts to seek the effect of capital structure on the firm's performance specifically for Malaysian construction firms.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the samples, data collection, variables, the expectation of the results and theoretical framework of the study. This chapter also covers the development of hypotheses and methodology that are used in this study.

3.1 Sample and Data Collection

The aim of this study is to examine the effect of capital structure on the firm's performance for construction firms listed on the Main Market of Bursa Malaysia. This study covers a 7-year period of study from 2009 till 2015. The data are obtained from DataStream and firm's annual report. Currently, they are 44 public listed firms have been registered as a construction firm in Malaysia. After considering all the missing and incomplete data, this study uses 21 firms with 10 years trading experience on the Main Market of Bursa Malaysia. This study consists of a balanced panel data of 21 firms with 7 years period of study. The total number of observations of this study is 147.

3.2 Variables

This section covers about the dependent variable, independent variables and control variables that use in this study.

3.2.1 Dependent Variable

Based on literature review, there are a number of different measures that use as to represent the firm's performance. Firm' performance can be measured either using accounting based measurement or market based measurement. Accounting based measurement is calculated from the firm's financial statement for examples return on assets (ROA), return on equity (ROE), net profit margin (NPM) and some other profitability ratios. On the other hand, Tobin's Q and market-to-book ratio are the examples of a firm's performance that measures by market based measurement. This study uses ROA as the dependent variable. According to Wasiuzzaman and Gunasegaven (2013), ROA used to measure how well the company uses its assets to generate additional profits.

Return on Assets (ROA)

ROA is a functional indicator to firm's performance (profitability). It is widely used in previous researches. The measurement of ROA is based on Yazdanfar and Ohman (2015), Akeem et al., (2014), Salawu (2009) and Tapanjeh (2006), where ROA is calculated as net income divided by total assets.

$$ROA = \frac{Net\ Income}{Total\ Assets} x\ 100$$

3.2.2 Independent Variables

This study employs three independent variables as proxies to firm's capital structure, namely short term debt to total assets (STD), long term debt to total assets (LTD) and total debt to total assets (TD). They are presented in ratio.

a) Short Term Debt (STD)

Short term debt is one of the famous indicators that used in the past studies as to indicate the firm's capital structure. Literature has been claimed (Dawar, 2014; Abor, 2005) that short term debt is calculated as short term debt to total assets. Previously, STD shows the inconclusive effect on firm's performance. For example (Yazdanfar and Ohman, 2015; Khan, 2012; Ebaid, 2009) found a negative relationship between STD and ROA. Somehow, (Khanam et al., 2014; Salim and Yadav, 2012; Salawu, 2009) found that STD does not have any impact on firm's performance. This study expects that STD has an impact on firm's performance.

$$STD = \frac{Short\ term\ Debt}{Total\ Assets} x100$$

b) **Long Term Debt (LTD)**

Likewise, long term debt also one of the indicators that commonly used in past empirical studies. The measurement of long term debt is similar between the studies (for example Gill et al., 2011; Chowdhury &

Chowdhury, 2010; Salawu, 2009) where long term debt is divided by total assets. Most of the past studies found a negative relationship between LTD and ROA like (Khanam et al., 2014; Hasan et al., 2014; Dawar, 2014). As following the past studies, LTD is used as one of the variables in this study. LTD is expected to have an impact on the firm's performance in the context of Malaysian construction firms.

$$LTD = \frac{Long\ term\ Debt}{Total\ Assets} x100$$

c) Total Debt (TD)

Consequently, total debt also one of the indicators that widely used in past studies. Studies (for instance Akeem et al., 2014; Salim & Yadav, 2012; Ahmad et al., 2012) found that TD has negative and significant with firm performance. However Khanam et al., (2014) found that TD has no impact on firm performance. Total debt is measured as firm's total debt divided by firm's total assets. TD is expected to have an impact on firm's performance for Malaysian construction firms.

$$TD = \frac{Total\ Debt}{Total\ Assets} x100$$

3.2.3 Control Variables

This study adopts two control variables that believe to have an effect on the firm's performance. They are as follows.

a) Size

The size of the company usually used as a control variable in many researches (for example Gill et al., 2011; Zeitun & Tian, 2007; Abor, 2005). Size can be measured by total assets and sales. Some studies suggest that size has an impact on the firm's performance (Sheikh & Wang, 2013). However, Hasan et al. (2014) found insignificant relation between size and firm's performance. This study uses total assets as proxy to the firm's size. It predicts that size has an impact on the firm's performance.

$$Size = Total\ Assets$$

b) Sales Growth

Growth is normally measured by firm's average total sales. Studies (like Dawar, 2014; Ahmad et al., 2012) found that growth does not impact the firm's performance. Somehow, Salim and Yadav (2012) found, growth has significant relationship with the firm's performance. In this study, growth is calculated as sales current year minus sales last year divided by sales last year. This study expects that sales have an impact on firm performance.

$$Growth = \frac{Sales1 - Sales0}{Sales0} x100$$

3.3 Expected Results

Table 3.1

List of variables, proxies and expected result

Variables	Symbol	Proxy	Expected result
Dependent	ROA	NI/TA	
Independent	STD	STD/TA	+/-
	LTD	LTD/TA	+/-
	TD	TD/TA	+/-
Control	SIZE	TA	+/-
	GROWTH	(S1-S0) /S0	+/-

Where:

ROA	Return on assets
STD	Short term debt
LTD	Long term debt
TD	Total debt
SIZE	Size
GROWTH	Sales growth
TA	Total assets
S1	Sales current year
S0	Sales last year

3.4 Theoretical Framework

This study attempts to investigate the relationship between capital structure and firm's performance. Based on the information above, a theoretical framework is drawn as to indicate the real picture of this study. Figure 3.1 shows the theoretical framework of this study.

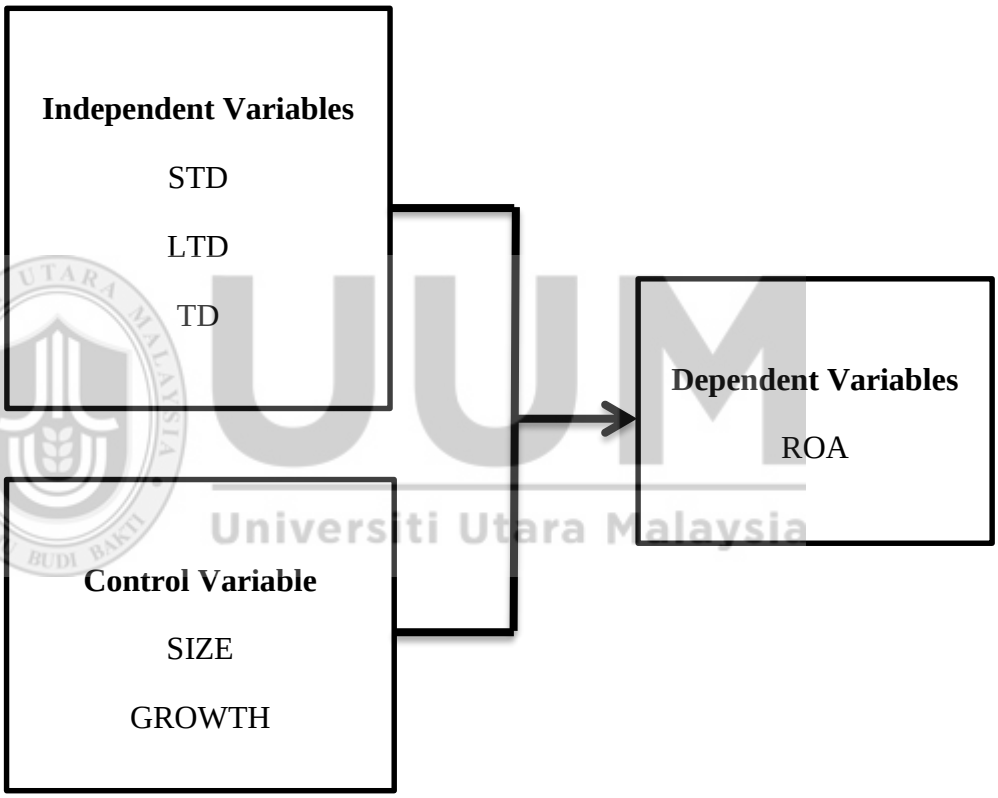

Figure 3.1

Theoretical Framework

Figure 3.1 shows the theoretical framework of this study. This study expects that all the variables have significant effect on the firm's performance.

3.5 Hypotheses

H0: There is no significant relationship between capital structure and firm's performance

H1: There is significant relationship between short term debt and firm's performance

H2: There is significant relationship between long term debt and firm's performance

H3: There is significant relationship between total debt and firm's performance

H4: There is significant relationship between firm's size and firm's performance

H5: There is significant relationship between growth and firm's performance

3.6 Model

It is postulated that all variables have significant relationship with firm's performance. Based on the list of variables and theoretical framework, a general model for this study is written as:

$$ROA_{it} = \alpha + \beta 1 STD_{it} + \beta 2 LTD_{it} + \beta 3 TD_{it} + \beta 4 SIZE_{it} + \beta 5 GROWTH_{it} + u_{it} \quad (3.1)$$

Where,

ROA_{it} = Net income per total assets (i) at time t

STD_{it} = Short term debt per total assets (i) at time t

LTD_{it} = Long term debt per total assets (i) at time t

TD_{it} = Total debt per total assets (i) at time t

$SIZE_{it}$ = log total assets (i) at time t

$GROWTH_{it}$ = Average sales (i) at time t

3.7 Methods of Estimation

This section discusses on the how to model the error term in regression model specified to panel data. The basic panel data regression model specifies as:

$$Y_{it} = \alpha + \beta_1 \chi_{it} + \varepsilon_{it}, \; i = 1,\ldots,N; \; t = 1,\ldots,T; \tag{3.2}$$

Referring to the above equation, ε_{it} is refers to the error term with E (ε_{it}) ~N ($0,\sigma^2$). Fundamentally, there are three techniques that available to estimate the equation (3.2). The techniques are pooled ordinary least square (Pooled OLS) model, random effect (RE) model and fixed effect (FE) model. These three models are depending on the presumption of the intercept, the slope of coefficient and the standard error terms. The deviation of those three models is discussed below.

3.7.1 Pooled Ordinary Least Square (Pooled OLS)

The pooled OLS model is estimated based on general OLS regression. The model is written as below:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + u_{it} \quad (3.3)$$

Where *i* refer to the *i*th cross-sectional unit and *t* refers to *t*th time period. It assumes that there are maximum of *N* cross-sectional entities and maximum of *T* time period. This model is a balanced panel data since each of its cross-sectional units has the same number of time series observation. Equation (3.3) postulates that the intercept and the slope coefficient are the same across subject and time. The error term u_{it} compress differences over time and individual. After all, pooled OLS have limitation; which it does not distinguish between various cross-sectional entities. Therefore, by combining and pooling the cross-sectional unit it simply denies the heterogeneity or individuality that may exist among the entities. It is also simply assumed that all that entities are the same. Due to the simplicity, pooled OLS regression may mislead the real relationship between Y and X across the cross-sectional (Gujarati & Porter, 2009). For this study, the pooled OLS model is drawn as:

$$\begin{aligned} ROA_{it} = {} & \alpha + \beta 1 STD_{it} + \beta 2 LTD_{it} + \beta 3 TD_{it} + \beta 4 SALES_{it} \\ & + \beta 5 GROWTH_{it} + u_{it} \end{aligned} \quad (3.4)$$

All the cross-sectional entities have the same number of time series investigation. Equation 3.4 presumes that the output of the interception α and slope coefficients (β_1, β_2, β_3, β_4 and β_5) are consistent across time series and space. The error terms u_{it} compresses divergence over time and entities.

3.7.2 Fixed Effect (FE)

Since there are limitations on pooled OLS, panel data of random and fixed effect has an ability to handle the heterogeneity or individuality. Under the FE model it is assumed that each entity like country and company has its own characteristic that may or may not to influence the independent variables. Therefore the FE model lets the intercept differ for each cross-sectional unit. However, the slope coefficients are still constant across the cross-sectional unit. In addition, in FE model each entity's intercepts are time invariant. This technique is adopted when there are correlation between individual specific intercept with one or more regressors. Besides, the slope of coefficient is presumed do not diverge across entities or over time. Following Gujarati and Porter (2009), the specification of fixed effects model is as:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + u_{it} \quad (3.5)$$

Where, *i* on intercept term in equation 3.5 propose that the intercepts of the cross-sections may be not the same. Equation 3.6 indicates the FE model that uses in this study. The model is written as:

$$ROA_{it} = \alpha_i + \beta 1 STD_{it} + \beta 2 LTD_{it} + \beta 3 TD_{it} + \beta 4 SALES_{it} + \beta 5 GROWTH_{it} + u_{it} \quad (3.6)$$

3.7.3 Random Effect (RE)

RE model is developed in order to respond to the inquiry elevated from the use of dummy variables in FE model. The use of dummy variable in FE model reflects the inadequacy of information about the model. Somehow rather, in the RE model it assumes that the intercept of an individual unit is a random drawing from huge population with a constant value of mean. Moreover, Gujarati and Porter (2009) rather treating intercept as α_i in fixed (refer equation 3.5) it assumes as random variables with a mean value of α without i. Expression of the interception of individual cross-section as below:

$$\alpha_i = \alpha + \varepsilon_i \quad (3.7)$$

Where $i = 1,\ldots,N$ and ε_i is a random error term with a mean value of zero and variance σ_ε^2 . In short, it says that the whole cross-section entities have a common intercept mean value. Furthermore, the individual discrepancy in the intercept values of each of the cross section entities are also reflected in the error term of ε_i. It is the deviation from constant mean value.

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \omega_i \quad (3.8)$$

Where

$$\omega_{it} = \mu_{it} + \varepsilon_{it} \quad (3.9)$$

The error term of RE model is represents as ω_{it} which consist of both u_{it} and ε_{it}. The ε_{it} is refers to the error term of individual-specific. Meanwhile, u_{it} refers to the error term component that combine both time series and cross-sectional.

$$ROA_{it} = \alpha + \beta 1 STD_{it} + \beta 2 LTD_{it} + \beta 3 TD_{it} + \beta 4 SALES_{it} + \beta 5 GROWTH_{it} + \omega_{it} \quad (3.10)$$

Equation 3.10 indicates the RE model that use in this study. The model is written as above.

3.7.4 Breusch and Pagan Lagrangian Multiplier Test and Hausman Test

It is important to highlight the Breusch and Pagan LM test and Hausman test. In order to estimate either the pooled OLS model or RE model is better, the Breusch and Pagan LM test is executed. Pooled OLS is present as the null hypothesis. By looking at the probability of the chi2, if the value is less than 0.05 then the null hypothesis is rejected. Hence, RE model is more appropriate over the pooled OLS model. Additionally, Hausman test is

executed in order to decide either to use RE model or FE model. RE model function as null hypothesis. By referring the probability of chi2, if the value is less than 0.05 then FE model is more appropriate. Hence, the estimation can be further improved by the adoption of FE model with robust standard error or Generalized Least Squares (GLS).

3.7.5 Fixed Effect with Robust Standard Error (FE Robust)

The existence of the heteroskedasticity problem under FE model pushes the use of FE model with robust standard error. The heteroskedasticity problem causes the biased in standard error. Huber-White sandwich is an estimator that uses to estimate the standard error under robust option. This robust standard error option is able to deal with minor problems like heteroskedaticity and normality.

Under the robust option, its estimation of coefficients is exactly same with the FE model. However, the standard error takes into account the issue of heterogeneity. Therefore, the same FE model is used in this estimation. The specification of the fixed effects model with robust standard error is as:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + u_{it} \quad (3.11)$$

$$\mathrm{ROA}_{it} = \alpha_i + \beta 1 \mathrm{STD}_{it} + \beta 2 \mathrm{LTD}_{it} + \beta 3 \mathrm{TD}_{it} + \beta 4 \mathrm{SALES}_{it} + \beta 5 \mathrm{GROWTH}_{it} + u_{it} \quad (3.12)$$

The robust standard errors never change the coefficients. Somehow rather, it changes the t-statistics with reasonably accurate p-values. Hence, FE with robust standard errors is a famous and reliable method to deal with heteroskedasticity problem.

3.8 Diagnostic Tests

Lastly, in order to test the validity and reliability of the models, it will be exposed to the diagnostic test. The tests used to check multicollinearity, heteroskedasticity and autocorrelation problem. VIF is adopted in order to check the multicollinearity problem. If the mean value is less than 5 then the model is free from multicollinearity problem. Multicollinearity is a condition where the variables used in the study are highly correlated to each other. On the other hand, the Modified Wald statistic is used to test the groupwise heteroskedasticity problem in fixed effects regression. Homoskedatic is presented as the null hypothesis. By looking at the probability chi2, if the value is less than 0.05 then the null hypothesis is rejected. Furthermore, autocorrelation in panel data is detected by Wooldrige test. No autocorrelation is presented as the null hypothesis. The null hypothesis is rejected if the probability value of chi2 is less than 0.05.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.0 Introduction

This chapter highlights the findings and discussions of the two main objectives: to investigate the impact of capital structure on firm's performance on Malaysian construction firms and to highlight theories of capital structure that closely related to the capital structure of Malaysian construction firms. As mentioned in the previous chapter, the relationship between capital structure and firm's performance examines using the static linear panel data analyses of pooled OLS, random effect (RE) model, fixed effect (FE) model and fixed effect (FE) model with robust standard error. The following discussions are as below.

4.1 Descriptive Statistic

Descriptive statistic describes the basic characteristics of the data that used in this study. It arranges for a simple summary of the whole dataset. Based on the descriptive statistics, a simple analysis on the data can be made.

Table 4.1

Descriptive Statistic

Variable	Mean	SD	Min	Max	N
ROA	26.55	4.389	1	36.338	147
STD	12.652	9.048	0.0091	40.904	147
LTD	13.540	12.174	0.001	52.420	147
TD	26.192	13.401	0.094	58.493	147
SIZE	1938174	3330139	172048	1.95e+07	147
GROWTH	111.792	55.316	1	532.878	147

Table 4.1 shows descriptive statistics of the underlying variables that used in this study. Descriptive statistic highlights mean, standard deviation, minimum and maximum value of each of the variables. Mean value of ROA is 26.55 with 1 and 36.338 of minimum and maximum value respectively. It indicates that on average the firms gain return on their assets at 26.55 percent. The mean of STD, LTD and TD are 12.652 percent, 13.540 percent and 26.192 percent respectively. It explains that in order to support the firm's operation, Malaysian construction firms are depending both on long term and short term debt. On top of that, Table 4.1 also shows 13.54 percent debt are from the portion of long term debt which indicates that Malaysian construction firms prefer to use long term debt rather than short term debt in order to support their daily operations. Table 4.1 also illustrates the mean of the SIZE and GROWTH which are 1,938,174 and 111.792 respectively. It indicates that, on average the firms have total assets of RM 1.9 million and the sales growth of 111.79 percent.

4.2 Correlation Matrices

Aside from determining the existence of the bivariate correlation between variables, correlation matrices also adopt as to ensure the correlation values among variables are not too high in order to limit the existence of a multicollinearity problem (Akeem et al., 2014 and Sheikh & Wang, 2011).

Table 4.2

Correlation Matrices

	ROA	STD	LTD	TD	SIZE	GROWTH
ROA	1.000					
STD	-0.342	1.000				
LTD	0.096	-0.229	1.000			
TD	-0.144	0.467	0.754	1.000		
SIZE	0.052	-0.005	0.335	0.301	1.000	
GROWTH	0.151	-0.142	0.291	0.169	-0.0197	1.000

Table 4.2 recaps the correlation among the variables. Consequently, based on Table 4.2 the correlation matrices of all variables are below than 0.8 which means that the variables are free from the multicollinearity problem (Husain, Affandi & Shukur, 2015). In addition, short term debt, total debt and size are negatively correlated to the return on assets. However, long term debt and growth are positively correlated to the return on assets.

4.3 Regression Analysis

As mentioned before, the relationship between capital structure and firm's performance examines using static linear panel data analyses. The results of each model are summarized in the tables that provided in this section. In order to be able to explain the variations, the data are presented in logged forms.

4.3.1 Pooled OLS

Table 4.3 summarizes the findings from the pooled OLS regression. Pooled OLS is the basic regression analysis of panel data.

Table 4.3

Pooled OLS Model

	Coefficient	t-statistic	Prob
Constant	2.079	7.59	0.000
LSTD	0.124	4.68***	0.000
LLTD	0.154	9.25***	0.000
LTD	-0.357	-7.84***	0.000
LSIZE	0.013	0.83	0.406
LGROWTH	0.328	9.67***	0.000
No of observation	147		
R-square	0.6689		

*Note: *** indicate the significance level at 1 % respectively*

Table 4.3 shows all variables proxies to firm's capital structure are significantly affected the firm's performance at 1 percent level of significance. Both short term debt and long term debt have a positive relationship with return on asset. It indicates increases in short term debt and long term debt lead to the increases in return on assets. Meanwhile, total debt has a negative relationship with return on assets. Growth is significantly positively affected firm's performance. Somehow rather, the firm's size that measured by log total assets shows an insignificant relationship with ROA. The R-square of pooled OLS model is 0.6689 which indicates, explanatory variables jointly account for 66.89 percent variation of the firm's performance.

4.3.2 Random Effect Model

Table 4.4 summarizes the findings of RE model. RE model is the second model that assumes the intercept of an individual unit is random.

Table 4.4

Random Effect Model

	Coefficient	t-statistic	Prob
Constant	2.314	7.13	0.000
LSTD	0.084	2.97***	0.003
LLTD	0.138	7.84***	0.000
LTD	0.291	-6.07***	0.000
LSIZE	-0.006	-0.03	0.767
LGROWTH	0.317	9.84***	0.000
No of observation	147		
R-square	0.6617		

*Note: ** and *** indicate the significance level at 5% and 1 % respectively*

Tables 4.4 illustrates the R-square of RE model is 0.6617. It indicates 66.17 percent of independent variables can explain the dependent variable. Another 33.83 percent is explained by other factors that exclude from this study. In this model, firm's capital structure (STD, LTD and LTDTA) are positively affected the firm's performance at 5 percent level of significance. It explains, increases in capital structure leads the increases of return on assets. It is in the line with trade-off theory, where an increase in debt level leads to the firm's better performance. On the other hand, size is insignificantly affected the firm's performance. Conversely, firm's growth shows a positive and significant relationship with return on assets that means an increase in sales growth leads firm's better performance.

4.3.3 Fixed Effect Model

The findings of FE model are summarized in Table 4.5. FE model assumes that each entity has its own characteristic that may or may not to influence the independent variables.

Table 4.5

Fixed Effect Model

	Coefficient	t-statistic	Prob
Constant	4.588	6.74	0.000
LSTD	0.021	0.67	0.505
LLTD	0.116	6.10***	0.000
LTD	-0.173	-3.32***	0.001
LSIZE	-0.183	-3.61***	0.000
LGROWTH	0.309	6.74***	0.000
No of observations	147		
R-square	0.3976		

*Note: ** and *** indicate the significance level at 5% and 1 % respectively*

Based on the above table, 39.76 percent of explanatory variables can explain the dependent variables. Another 60.24 percent is explained by other specific and macroeconomic factors which are excluded from this study. Long term debt and total debt are significant to ROA with positive and negative impact respectively. On the other hand, short term debt is insignificant at any conventional level of significance. It indicates that short term debt does not give any impact on firm's performance. Nonetheless, all control variables are significantly affecting the firm's performance. Size has a negative relationship with ROA meanwhile growth has a positive relationship with ROA.

4.3.4 Breusch and Pagan Lagrangian Multiplier Test and Hausman Test

Breusch and Pagan LM test is used to test the RE model. This test is important in order to choose either pooled OLS model or RE model. On the

other hand, Hausman test is conducted in order to choose either to adopt the RE model or FE model for the entire study.

Table 4.6

Breusch and Pagan LM Test and Hausman Test

	Prob> chi2
Breusch-Pagan LM test	0.0039***
Hausman test	0.0000***

Based on Table 4.6, prob>chi2 of Breusch and Pagan LM test it is less than 0.05 which indicates that RE model is more appropriate than pooled OLS model. In other words, there are firm-specific effects in the data.

Besides, prob>chi2 of Hausman test provided in Table 4.6 also shows that its value is less than 0.05 Therefore, FE model is more appropriate over the RE model.

4.4 Post-estimation Diagnostic Tests

The diagnostic test is necessary in order to check the problems of multicollinearity, heteroskedasticity and autocorrelation. The results of the tests are written in Table 4.7.

Table 4.7

Diagnostic Test

	Mean	Prob >chi2
Multicollinearity (VIF)	3.00	
Heteroskedasticity (X^2 – stat)		0.0000***
Serial Correlation (F-stat)		0.3737

Variance inflation factor (vif) is used for the purpose of identifying the multicollinearity problem. According to Gujerati and Porter (2009), multicollinearity problem exists when the mean value of vif is more than 5. Hence, this study is free from multicollinearity problem since its mean value is only 3.00. Furthermore, Modified Wald Statistic is used to test the heteroskedasticity problem. Table 4.7 shows the prob>chi2 of Modified Wald statistic is less than 0.05 which is 0.0000. Thus, the FE model is considered to have a heteroskedasticity problem. Finally, the Wooldridge test is conducted in order to check the existence of autocorrelation problem. The prob>chi2 of Wooldridge in Table 4.7 is more than 0.05 (0.3737). It indicates that the FE model is free from autocorrelation problem.

In general, the FE model is more appropriate compared to RE model and pooled OLS. However, this model is diagnosed with heteroskedasticity problem. Therefore, the fixed effect model with robust standard error is deployed to rectify the heteroskedasticity problem.

4.5 Fixed Effect with Robust Standard Error

This section represents the final result that uses in this study. Due to the existence of a heteroskedasticity problem in FE model, FE model with robust standard error is adopted because it is more appropriate and reliable. The results are as below.

Table 4.8

Robust Fixed Effect Model

	Coefficient	t-statistic	Prob
Constant	4.588	3.99	0.001
LSTD	0.021	0.69	0.495
LLTD	0.116	3.07***	0.006
LTD	-0.172	-2.42**	0.025
LSIZE	-0.183	-2.14**	0.045
LGROWTH	0.309	4.35***	0.000
No of observations	147		
R-square	0.3976		

*Note: ** and *** indicate the significance level at 5% and 1 % respectively*

Table 4.8 recaps the findings from the FE model with robust standard error. Based on FE robust, short term debt shows an insignificant relationship with ROA. This finding is in the line with Salawu (2009) who suggests that short term debt does not give any effect on firm's performance.

In addition, Table 4.8 also shows both of long term debt and total debt are significantly affecting the firm performance at 1 percent and 5 percent level of significance respectively. Long term debt has a positive relationship with ROA. It explains that 1 percent increase in long term debt, the firm gains at least 11.6 percent on return on its total assets. Naturally, the construction firms in Malaysia are highly depending on long term debt in order to support their daily operations (Purhanudin & Zakaria, 2015). Aside from using long term bank borrowings, Malaysia construction firms also depending much on long term bond and *Sukuk*. They usually used long term debt for the purpose of financing their fixed assets and also as a capital injection to buy the raw materials and construction equipment.

Nevertheless, findings show that firm's total debt has a negative and significant relationship with ROA. It explains, every 1 percent increase in total debt, the firm's return on assets decreases up to 17.2 percent. This finding is parallel with (Akeem et al., 2014; Hasan et al., 2014; Khan, 2012; Zeitun & Tian, 2007). Total debt is comprised of both long term debt and short term debt. Previously discussed that increased in LTD lead to the increased of ROA. Therefore, it is in the line with trade-off theory which suggests that even though there is tax deductibility benefit in debt financing, overleveraging might put the firm into the financial distress. Primarily, it explains that up to the certain level; debt is positively affected the firm performance. However, if the debt is exceeding the level that it is supposed to be, it might cause some difficulties to the firm to meet its obligations. Later, firm's performance will be volatile and it eventually would push the firm into the bankruptcy.

This study used total assets as a proxy to the firm's size. The finding shows that size have a negative and significant relationship with firm's performance. Generally, total assets are comprised of current assets and fixed assets. According to Homaid and Tijani (2015), most fixed assets of construction firms are considered as moving assets. The examples of construction equipment that considered as moving assets including the heavy earth moving, light equipment, pick-up trucks and lifting and material handling. Aside from associated with depreciation value, those said equipment also very expensive plus with high cost of maintenance. Therefore, owning too much fixed assets would eat the firm's margin. Hence, it is better to lease or rent those moving assets since it helps to cut some cost that needs to be borne

by the firms. Therefore, the smaller the assets owned by the firms the better the firm's performance. This finding supported a study by (Hasan et al., 2014) who also found a negative significant relationship between size and firm's performance.

Firm's performance is also affected by the sales growth. In the construction industry, aside from using sales growth as to indicate the firm's growth; productivity, innovation, technology advancement and industrial sustainability also used as to measure the firm's growth (Bakar, Tabassi, Razak & Yusof, 2012). The increased trend in sales of construction firms is caused by many factors. For example in 2015, Ireka Berhad stated that an increases in its revenue are donated by the increased in volume of work completed (Ireka Berhad, 2016). This study found a positive relationship between growth and firm's performance with 1 percent level of significance. It describes that increase in growth associated with increase in ROA. This result is parallel to Zeitun and Tian (2007) who also found a positive significant relationship between growth and firm's performance.

Table 4.9

Results of Panel Data Analysis

	Pooled OLS	**Random Effect**	**Fixed Effect**	**Fixed Effect Robust**
Constant	2.08	2.31	4.58	4.59
	(7.59)	(7.13)	(6.74)	(3.99)
LSTD	0.12	0.08	0.02	0.02
	(4.68)***	(2.97)**	(0.67)	(0.69)
LLTD	0.15	0.14	0.12	0.12
	(9.25)***	(7.84)***	(6.10)***	(3.07)***
LTD	-0.36	-0.29	-0.17	-0.17
	(-7.84)***	(-6.07)***	(-3.32)***	(-2.42)**
LSIZE	0.01	-0.01	-0.18	-0.18
	(0.83)	(-0.30)	(-3.16)***	(-2.14)**
LGROWTH	0.32	0.32	0.31	0.31
	(9.67)***	(9.84)***	(9.89)***	(4.35)***
Observation	147	147	147	147
Adj R^2	0.6689	0.6619	0.3976	0.3976
Breusch-Pagan LM test		8.33 (0.0039)***		
Hausman test			43.33 (0.0000)***	
Multicollinearity (VIF)			3.00	
Heteroskedasticity (X^2 – stat)			1280.96 (0.0000)***	
Serial Correlation (F-stat)			0.828 (0.3737)	

*Note: ** and *** indicate the significance level at 5% and 1 % respectively*

Table 4.9 recaps the findings of all regression models.; pooled OLS model, RE model, FE model and FE robust standard errors. Based on Table 4.9 it shows different results reported by each model. First two models; pooled OLS and RE model show all variables are significantly affected the firm's performance except the firm's size. However, FE and FE robust show only short term debt has insignificant relationship with ROA. It indicates any changes in short term debt do not give any impact to firm's performance.

After considering the diagnostic tests, this study used FE model with robust standard error as the final model.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter presents the summary of this study. This chapter also highlights the limitations of the study and some key recommendations for future research.

5.1 Summary

This study aims to investigate the effect of capital structure on the firm's performance among Malaysian construction firms. This study used 21 construction firms that currently traded on the Main Market of Bursa Malaysia as samples of the study. It covers a 7-year period of study from 2009-2015.

In order to provide a sufficient understanding of how capital structure affects the firm's performance, a critical reviewed on the theoretical literature of capital structure like Modigliani Miller theorem, trade-off theory, pecking order theory and agency cost theory has been made. Moreover, an extensive amount of empirical literature also was reviewed in order to identify the measurement and proxies of capital structure and firm's performance. Finally, this study adopts return on assets (ROA) as a proxy to firm's performance. Short term debt to total assets (STD), long term debt to total assets (LTD) and total debt to total assets (TD) used as proxies to capital structure. In addition, size and sales growth are used as control variables in this study.

A series of regression model have been conducted including pooled OLS model, RE model, FE model and FE model with robust standard error. FE robust is used as to mitigate the heteroskedasticity problem in FE model. Therefore, the result of FE model with robust standard error is considered as the best model for this study.

The study finds that variables proxies to capital structure like LTD and TD are significantly affected the firm's performance except the STD. LTD shows a positive and significant relationship with the firm's performance. On the other hand, TD shows a negative and significant relationship with firm's performance. This condition is incongruent with MM theorem; where choices of debt and equity do not give any impact on the firm's performance. Nevertheless, it fits the trade-off theory. Under the trade-off theory, it explains that the more debt used by the firm the more tax shield will be enjoyed by the firm. However, it is only fitted at a certain level. If the firm overleverages its capital, then it will cause the difficulties to meet the interest payment obligation which later would jeopardise its value. Therefore, it is plausible to have a positive relationship between LTD and ROA and a negative relationship between TD and ROA.

Moreover, this study finds that both firm's size and growth have an impact on firm's performance. The firm's size that measured by total asset shows a negative relationship with performance. It indicates that the smaller the total assets the better. It is considered as the nature of the construction industry to own small fixed assets, where most of them prefer to lease their fixed assets rather than owning them due to the high cost of maintenance. Therefore, the high cost would decrease firm's profitability. In contrary, growth shows a positive relationship with performance. It indicates that increase in sales growth would increase the

firm's performance.This finding is in the line with (Salim & Yadav, 2014; Zeitun & Tian, 2007). All in all, this study suggests that capital structure refers to total debt (TD) has a negative relationship with firm's performance that is in the line with the trade-off theory.

5.2 Limitations and Recommendations

Based on the findings, the construction firms in Malaysia is recommended to look seriously into their capital structure. Previously mentioned, Malaysian construction firms highly depending on debt financing in order to support their operation. Most firms prefer to adopt long term debt over the short term debt. Somehow rather, as looking to the result, it suggests that too much rely on debt able to reduce the firm's profitability. Therefore, it is suggested that the firm's financial manager need to take a proper action to plan and work on the optimal capital structure. Too much depend on debt would cause the high cost of bankruptcy which leads to lower performance.

Along the way to finish this study, there are few limitations has been faced. Due to the unavailability of data, this study only used 21 out of 43 construction firms listed on the Bursa Malaysia. The period of this study is from 2009-2015. Therefore, this study has a small cross-sectional unit plus with small time series observations. Due to those said limitations, the future research is recommended to add the cross-sectional unit and time series observations so that it can produce better results.

Other than that, it is also important to highlight that this study is not split the firms into a specific category like small, medium and large construction firms.

For the sake of better picture on the effect of capital structure on construction firm's performance, future studies are recommended to split the firms into those said categories. It is important to highlight that because different categories of firms applied different way in financing its operations.

In addition, in future studies, they are also recommended to consider other variables in order to investigate the effect of capital structure on firm's performance. This study used the accounting base measurement as to measure the firm's performance. Aside from using the accounting based measurement, market based measurement also very important in determining the firm's performance. Thus, future researches may consider share price, Tobin's q and earnings per share as an indication of firm's performance.

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