# EFFECT OF WORKING CAPITAL MANAGEMENT AND CAPITAL STRUCTURE ON FIRM'S PROFITABILITY: EVIDENCE FROM MALAYSIA LISTED MANUFACTURING FIRMS

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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 18182 words.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| ADF | Augmented Dickey-Fuller |
| CCC | Cash Conversion Cycle |
| DEBT | Debt Ratio |
| DIO | Days of Inventory Outstanding |
| DPO | Days of Payable Outstanding |
| DSO | Days of Sales Outstanding |
| EVIEW | Econometric Views |
| FEM | Fixed Effect Model |
| GDP | Gross Domestic Product |
| ISE | Istanbul Stock Exchange |
| LLC | Levin, Lin and Chu |
| LM | Lagrange Multiplier |
| POLS | Pooled Ordinary Least Squares |
| REM | Random Effect Model |
| ROA | Return on Assets |
| TTM | Trailing Twelve Months |
| WCM | Working Capital Management |

## ABSTRACT

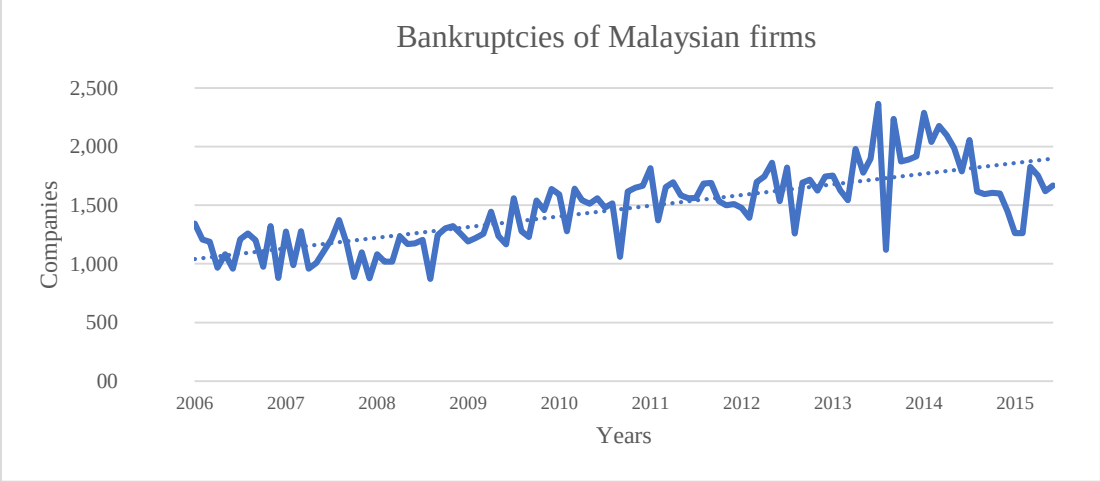
This study attempts to examine the effect of working capital and capital structure on firm's profitability. The study is based on secondary data collected from 57 manufacturing firms listed in Bursa Malaysia, covering a period of eleven years from 2006 to 2016. Components of cash conversion cycle, which are days of sales outstanding, days of inventory outstanding and days of payable outstanding are used as measure of working capital management, while debt ratio acted as measure of capital structure. To bring up more robust results, this study used more than one estimation technique, including panel data analysis, fixed and random effects, and panel unit root test. The empirical findings showed that there is existence of significantly negative relationship between days of sales outstanding and debt ratio towards firm's profitability as measured by return of asset, whereas significantly positive relationship exists between days of inventory outstanding and firm's profitability. Although days of payable outstanding were found to be negatively related to firm's profitability as well, it is statistically insignificant. Based on the findings, recommendation is provided for manufacturing managers to be implied for a better firm management and improved performance, in acknowledgement of the importance of working capital and capital structure management in influencing firm's profitability.

# CHAPTER 1: RESEARCH OVERVIEW

## 1.0 Introduction

When an economic downturn happened during Asian financial crisis, the value of the Malaysia Ringgit had depreciated sharply and followed by an extreme decline in stock price. As a result, it reduced the confidence of business for continuous operations and increased the number of company being bankrupt. Normally, the failures in business are more likely due to the lowering profits or the losses that happened for several years, inadequate working capital, excessive debts, error in managerial, misjudgments and frauds in making business decision (Yap, Munuswamy & Mohamed, 2012).

Figure 1.1: Number of company's bankruptcies in Malaysia from year 2006 to 2015




Source: Central Bank of Malaysia

Figure 1.1 represent the number of company's bankruptcies in Malaysia (plotted on vertical axis) from period 2006 to 2015 (plotted on horizontal axis). As we can see, the bankruptcies of Malaysian companies have soared from year 2006 to 2015. There were a lot of firms in Malaysia facing insolvency where the rate has reached an all-time high of 2,300 companies in a year. It gives a signal to other firms in Malaysia to control their working capital and capital structure in a proper manner since both of these factors are one of the possible reasons that cause company to become bankrupt.

A well-organized working capital management and capital structure indicate a firm's capability to create value for their shareholders and ensure the firm to survive for a longer time-period. Capital structure is a major aspect of financial decision making in corporate finance world. According to Chan, Yap and Chai (2011), if the firms unable to fulfil their periodic debt payments, they will encounter to financial distress costs. While working capital management comprises of current assets and current liabilities which having the ability to control both of it in providing firm with maximum return on assets and minimize their payments on liabilities. Besides the main objective of firm is to earn higher profit, they should know that maintaining firm's liquidity is another major strategy to earn return by lowering the cost of liquidity. Hence, the firm needs to balance between these two criteria when implementing the firm strategies (Makori & Jagongo, 2013).

Most of the studies on firm's profitability focused on either working capital or capital structure. However, there are rather less studies that combine both working capital and capital structure to study the relationship between them with firms' profitability. Thus, the following research questions will be examined: What is the relationship between debt ratio (DEBT), days of sale outstanding (DSO), days of inventory outstanding (DIO), and days of payable outstanding (DPO) to Malaysia listed manufacturing firm's profitability respectively where four of these will act as the independent variables while profitability of firms as dependent variable.

The main purpose in this study is to evaluate the impacts of working capital and capital structure on firm's profitability for a sample of 57 manufacturing firms listed in Bursa Malaysia from period 2006 to 2016. Once the factors are recognized, the companies in Malaysia will have awareness and outlook on which characteristics they need to observe as signs and symptoms to prevent them from influencing their profitability and lowering the chance of getting bankruptcy. From the empirical studies, we come out with four hypotheses where the components of working capital and capital structure are negatively related to firm's profitability. We also identify the significance and contribution in investigating this research where it provides useful and important information for the stakeholder.

## 1.1 Research Background

Over the last decade, Malaysia economy has gone through a lot of changes. There was an economy downturn with a major shock in the three sub-periods (1985-6, 1997-8 and 2008) and experienced an economy boom from 1970 to 2009 with the lower average inflation rate. With the altering of market conditions, manufacturing industries in Malaysia had been affected since it was the path proceeds to development. Manufacturing industries in Malaysia also play an important role in contributing to Malaysia export and providing job employment. In 2017, Malaysian export increased by 4.7% from RM75.8 billion where the main products contributed to the increase included electrical, electronic, liquefied natural gas and crude petroleum (Department of Statistics, 2017).

Besides that, manufacturing sector in labor productivity increased by 3.6% at RM115,434 and the employment rate has grown slightly by 1.8% during third quarter of 2017 (Department of Statistics, 2017). Given these contributions, the role of manufacturing sector has become significant in contributing to Malaysia economic

growth. According to Ng, Ye, Ong and Teh (2017), economy recession in 2008 had brought attention to the well-organized working capital management to the front line to prevent from more losses or insolvency. Therefore, working capital management and capital structure are very essential in corporate finance especially in manufacturing sectors as majority portion of assets was comprised of current assets and it directly influenced the firm's liquidity, profitability and credibility (Hoang, 2015; Yogendrarajah & Thanabalasingan, 2014).

Normally, a typical manufacturing company's current asset have occupied over half of its total assets. Hence, if the current assets go beyond the standard level, the firm will experience a deficient return on assets easily. For example, when a company is over conservative in keeping most of the cash rather than reinvest in their operation, it will cause the company to loss the opportunity to earn higher profit. However, if the firm has too few or insufficient current assets, they might face shortages when there is product demand and difficult to maintain the operation of the business (Yogendrarajah & Thanabalasingam, 2014; Hoang, 2015). Therefore, financial executives should make distinct decisions about the level of these components wisely in order to maximize company profitability.

In capital structure, it is concerning on total debt which include long-term and short-term debt. In this study, we are using working capital management and capital structure as our independent variables to investigate their respective roles in determining the profitability of firms, liquidity and also credibility. The most important components in working capital management included DSO, DIO and DPO which are the combination of cash conversion cycle (CCC) (Wasuizzaman, 2015; Zariyawati, Annuar, Taufiq & Rahim, 2009; Mohamad & Saad, 2010; Ng et al., 2017; Jakpar, Tinggi, Siang, Johari, Myint & Sadique, 2017; Makori & Jagongo, 2013; Hoang, 2015; Yogendrarajah & Thanabalasingan, 2014; Mawutor,2014; Anandasayan, Raveendran & Raveeswaran, 2012; Mansoori & Muhammad, 2012; Deloof, 2003; Alipour, 2011).

Each component has its own characteristic and is theoretically significant over the firm's profitability. According to Mansoori and Muhammad (2012), the longer the period it takes to collect back the cash, it would reveal that the firm is experiencing cash flow problem and this will affect the firm's profitability. Thus, it is important for financial manager to practice advisable credit policies to attract customers and at the same time to lower down the financing cost on these credits.

While for DIO, the research from Hoang (2015) and Yogendrarajah and Thanabalasingam (2014) stated that the firms will expose to more liquidity risk in the level of inventory if their average inventories period is too high. To have an efficient management, the firms are advised to have a low average inventories period. However, there is a contrast saying that too low of inventory level will reveal that the firm is lacking stock for sales and may lead to loss of profitability. Another component of CCC is DPO. According to Deloof (2003), a firm is able to assess the purchased quality by delaying the payments to the suppliers. It is also a low-cost and flexible source of financing for the firm. In spite of that, if the suppliers offer an early payment discount, postpone payments of invoices can be expensive.

Although there have been an increasing number of studies conducted on the topic of working capital such as Wasuizzaman (2015), Zariyawati et al. (2009), Mohamad and Saad, (2010), Ng et al. (2017), Jakpar et al. (2017), Makori and Jagongo (2013), Hoang (2015), Yogendrarajah and Thanabalasingan (2014), Mawutor (2014), Anandasayan et. al. (2012), Mansoori and Muhammad (2012), but the combinations of working capital management and capital structure on firm's profitability have not been extensively studied. Therefore, this study attempts to provide an understanding of the impact of working capital management and capital structure on profitability of 57 manufacturing firms listed on Bursa Malaysia over a period of 2006 to 2016.

## 1.2 Problem Statement

In the today's competitive and globalized business environment, survival of the company is getting more uncertain even though their financial statement is showing positive figure. Before the Asian financial crisis in mid-1997, Malaysia has a robust economic fundamental. However, after the crisis, most of the companies were affected where they were restructured and for the most serious cases, they fall into bankruptcy. According to Yang, Birge and Parker (2015), bankruptcy is a severe business decision where the company declares their incapability to meet financial obligation and fail to get the protection from their creditors. The firms may also get into bankruptcy if they are implementing inappropriate working capital strategies that decrease the firm's profitability (Yap et. al., 2012).

This might happen when the corporate income and cash flow are deficit and cause the distress firms to default on their financial obligation. In this situation, these firms will either split into the financial distressed company's category or fall into bankruptcy when they unable to cope with the uncertain change during economic recession (Chan et. al, 2011). As it is disclosed in introduction that the trend of bankruptcies in Malaysia is getting higher, it makes us curious to find out whether working capital and capital structure have any significant impacts on the Malaysia listed manufacturing firm's profitability. After the empirical results is found, the firm can take awareness on it and never neglect in managing every possible reason that will cause them to become another victim of bankruptcies.

A firm always witness the problem in working capital management of achieving balance between both liquidity and profitability, which might be a source of bad management resulting to bankruptcy. Theoretically, working capital management controls the level of liquidity of a firm. However, a firm's liquidity and profitability always been said to be inversely related to each other and pose conflicting objectives

since pursuit of either one will result to trade off of the another (Dash & Hanuman, 2008).

Even though an increasing number of research have been conducted on the relationship between working capital and firm performance in Malaysia, the findings of these studies are still lack in convincing, especially in the acknowledgment of working capital as one of the vital variables to manage firm's profitability. Moreover, the relationship between capital structure and firm's profitability is still controversial at this moment. Therefore, our study intends to provide clear evidence on how the working capital management and capital structure affect the firm's profitability in providing ideas to management of manufacturing firms in Malaysia.

## 1.3 Research Objectives

### 1.3.1 General Objective

This paper aims to evaluate the impacts of working capital and capital structure on firm's profitability using panel data analysis. Previous researches have found different relationship between these two independent variables on firm's profitability where it is not consensus. Besides that, there is rather limited number of studies are discussing about this topic in Malaysia. Therefore, the objective of this paper is to discover whether working capital and capital structure bring a positive impact or negative impact to the firm's profitability. This includes 57 sample of manufacturing firms listed in Bursa Malaysia for the period from 2006 to 2016.

### 1.3.2 Specific Objectives

The specific objectives of this paper are listed as follow:

i. To examine the impacts of debt ratio (DEBT) on Malaysia listed manufacturing firm's profitability.
ii. To examine the impacts of days of sale outstanding (DSO) on Malaysia listed manufacturing firm's profitability.
iii. To examine the impacts of days of inventory outstanding (DIO) on Malaysia listed manufacturing firm's profitability.
iv. To examine the impacts of days of payable outstanding (DPO) on Malaysia listed manufacturing firm's profitability.

## 1.4 Research Questions

There are four specific research questions in this study. They are shown as below:

(1) What is the relationship between debt ratio (DEBT) and Malaysia listed manufacturing firms' profitability?

(2) What is the relationship between days of sale outstanding (DSO) and Malaysia listed manufacturing firm's profitability?

(3) What is the relationship between days of inventory outstanding (DIO) and Malaysia listed manufacturing firms' profitability?

(4) What is the relationship between days of payable outstanding (DPO) and Malaysia listed manufacturing firm's profitability?

## 1.5 Hypotheses of the Study

This study also introduced four hypotheses as below:

(1) Debt ratio (DEBT) is negatively impacts towards Malaysia manufacturing firms' profitability.

(2) Days of sale outstanding (DSO) is negatively related to Malaysia manufacturing firms' profitability.

(3) Days of inventory outstanding (DIO) and Malaysia manufacturing firms' profitability have a negative relationship.

(4) Days of payable outstanding (DPO) is negatively related to Malaysia manufacturing firms' profitability.

## 1.6 Significance of the Study

After carried out the study, we found that most of the previous researchers are using either working capital or capital structure in investigating their relationship on firm's profitability. There are very rare to see any of the researchers are combining both working capital and capital structure in studying the impact on firm's performance. Besides that, the studies show different relationships between working capital and capital structure on profitability where there is no single consensus can be achieved in these studies. Therefore, it gives us a deeper perception to fill these gaps and contribute to the study by using both working capital and capital structure in determine their relationship toward profitability of firms.

The management of working capital and capital structure are considered as the important elements to maintain the level of firm's profitability. The findings of this study will contribute some guidance for researchers, managers, accountants, business and professional consultants and also policy makers in manufacturing firms. This study has various financial measurements to measure the firm's performance in terms of profitability, working capital management (DSO, DIO and DPO) and capital structure (DEBT).

In addition, this study will deliver some vital information to decision maker especially financial managers and policy planners. Hence, financial managers can have a better insight to create a better strategy and solution which able to improve the firm's wealth and thus profitability in future times. This study may have contribution to the investors who invest in Malaysia manufacturing firms and increasing in investment lead to the part of the economic growth in Malaysia. Other than that, this study may contribute to policymakers to understand the trend of the manufacturing firm in past and come out with a better policy or proposal to manage the working capital management and capital structure in an efficient way.

## 1.7 Chapter Layout

This research study is done and organizes as below:

### Chapter 1: Research Overview

This chapter begins with research background which outlines the general overview of the thesis topic and introduces the pivoting ideas that will be used throughout the study. Next part is the problem statement which the description of issues is intending to be addressed by research team and followed by research

questions and research objectives that focus on the purpose of performing this study. Then, the following part is the hypotheses of the study which are the statements that yet to be proved in the quantitative research. Lastly, significance of the study is stated in this part which explains the potential value of the study and how the findings will benefit to the targeted audience. This chapter ends by proving the layouts for the following chapters and conclusion.

## Chapter 2: Literature Review

This section consists of the documentation of a comprehensive review for previous studies that done by different researchers on the same topic. The finding, comparison of results among the researchers and the policy implication of the previous studies will be emphasized in this chapter. Besides that, it contains research framework, proposed theoretical or conceptual framework. Hypotheses were developed based on the literature reviews and research framework.

## Chapter 3: Methodology

This chapter covers the empirical framework, econometric method and research design that going to be use in this study. Moreover, data collection method and the rationale behind choosing the variable will be highlighted in this part also.

## Chapter 4: Data Analysis

This section analyses the model that we are going to use by making the comparison between POLS, FEM and REM. Each model is tested by their respective test which is likelihood test, Langrange Multiplier (LM) Test and Hausman test. In addition, this chapter discuss on panel data analysis from

summary of finding where we want to see whether our expected sign and estimated sign are consistent or not.

### Chapter 5: Discussion, Conclusion and Implications

This chapter used the analysis from previous chapter to answer the research question and hypothesis. It compared our results with the finding obtained from past researchers in drawing out a conclusion. Furthermore, managerial implication, limitation and recommendation will be suggested in this part based on the analysis results.

## 1.8 Conclusion

In this chapter, we have introduced the definition of working capital, capital structure and their importance in affecting Malaysia manufacturing firms' profitability. We started to have a deeper research on the topic background and identify the problem statement in order for us to set the research question which provide a clear direction to find out the answer and objective of the study.

Our research is different from others previous researchers as we are combining the elements of working capital and capital structure in examining the impact on 57 Malaysia manufacturing firms' profitability from 2006 to 2016. This might be a useful investigation for future researchers who study in this area, and we believe that our research will be a valuable source for them to refer. To have a further research on this study, we will proceed to the next chapter.

# CHAPTER 2: LITERATURE REVIEW

## 2.0 Introduction

The research background, problem statement, research questions, research objectives, and significance of the study have been discussed in chapter one. This chapter will be presenting about literature review. Literature review is the previous recognized researchers and scholars that have been published on a topic to be research. The literature review showed some purpose on how the relationship between previous studied and also theories that provide a context to our own research. It basically is being reviewed, analyzed, summarized, and expressed on the different past empirical researches to assist the future researchers to make decision on the nature of research study topic. Besides that, literature review is able to provide understanding towards studies into a deeper level as previous researcher had provided some recommendation on how to improve existing limitations faced by them during their research. Next, this chapter will continue with relevant theoretical model. Four theories had been included, which are Modigliani and Miller Theory, Trade off Theory, Pecking Order Theory and Cash Conversion Cycle (CCC) Theory. On top of that, conceptual framework and hypothesis development will also embed in this chapter. Lastly, there will be a short conclusion about this chapter.

# 2.1 Definition

## 2.1.1 Profitability

Profitability is defined as the capability of the firm or organization to generate profit from its day to day activities or defined as the ability of the firm to get and earn on return of investment that has been conducted. While the profit and profitability are two different terms with different meanings. Profit is defined as excess of return over the expenditure. According to Nishathini and Nimalathasan (2013), they indicated that profits are the main objective for the business. Meanwhile, the more accurate view of the firm's performance could be found out through profitability. A company asset is solely intended to generate more revenue and create profit (Arbidane & Ignatjeva, 2012). It will aid the management team and investors to identify whether the company has the ability to convert its investment in assets to profits.

## 2.1.2 Return on Assets (ROA)

Return on assets (ROA) is an indicator of how profitable a company is relative to its total assets, in percentage. Many researchers used it as an accounting measure for the firm's profitability. It is referring to the profitability on the asset after deducting the expenses and taxes (Mawutor, 2014). Besides that, Gnanasooriyar (2014) and Kung'u (2015) also mentioned that ROA acts as the indicator to evaluate how well the business utilized the assets in an efficient management to generate profits calculated.

### 2.1.3 Capital structure

Capital structure has been defined by many authors in several ways. According to Angahar and Ivarave (2016), capital structure gives a definition as components of debts and equity, exploit to finance company's operation. It normally consists of debt capital, preference share capital and ordinary share capital. In addition, Angahar and Ivarave (2016) also illustrated that capital structure consists of external and internal sources of financing which include long term and short-term debt, retained earnings and equity. The differences of the capital structure decision may be affected by the developed and developing countries.

### 2.1.4 Debt ratio (DEBT)

Debt ratio is in percentage that expresses as total debt relative to total assets. Comparison of debt can be made across different companies by using this ratio. It is the proportion of a firm's total assets that being financed with borrowed funds. Ratio that less than one means that the corporation has more assets over debt, while more than one means the company total debt is larger than total asset. The higher the debt ratio, the greater will be the risk and thus higher interest incur.

### 2.1.5 Working capital management

Working capital management is the management of the current assets and current liabilities. According to Mawutor (2014), working capital is the amount of the long-term finance that a business has to be provided to ensure the corporation is able to continue its operations. It can be further explained as financing firm's liabilities from their current assets and includes the usage of the component of current asset

which involve inventory, account receivable and cash to meet the firm's liabilities. In general, working capital management is dealing with the amount of the money they have, in term to carry out their daily activities (Aravind, 2016).

### 2.1.6 Days of sales outstanding (DSO)

DSO is a measure of the average number of days that a company takes to collect the proceeds after a sale has been made. It shows how well a firm's account receivables are being managed. In order to calculate, number of DSO has been used as proxy for the collection policy where the formula is accounts receivable divided by sales and multiplied by 365 days.

### 2.1.7 Days of Inventory outstanding (DIO)

DIO is financial measurement to measure how long a company's inventory is sold and replaced over a period of time. In general, a shorter DIO is preferable however the average of DIO varies from each other industry. DIO is calculated by inventory divided by cost of sales multiples by 365 days.

### 2.1.8 Days of Payable Outstanding (DPO)

DPO is numbers of days in the fiscal period as a multiple of account payable turnover. In other words, it is a company's average payable period that how long companies consume the time to pay for trade creditor. The longer the period pays to creditor, company need to have more enough money in hand as it is good for

working capital and free cash flows. The formula is account payable divided by purchase multiplied by 365days.

## 2.2 Literature Review

### 2.2.1 Profitability

Firms or companies can use plenty of measurements as the proxy of profitability. There are some empirical studies used gross operating profit, ROA, net profit ratio, return on equity and Tobin' Q to measure the profitability. According to Anandasayanan, Raveendran and Raveeswaran (2014), Bagchi and Khamrui (2012), Cristea and Cristea (2016), Saghir, Hashmi and Hussain (2011), Mohamad and Saad (2010), Tufail, Bilal and Khan (2013), Makori and Jagongo (2013), Uchenna, Mary and Okelue (2012), Samiloglu and Akgun (2016), Samilogli and Demingunes (2008), Javid (2014), Jakpar et al. (2017), Kasozi (2017), Jayarathne (2014), Zeitun and Tian (2007), Arunkumar and Radharamanan (2012), Bagchi, Chakrabarti and Roy (2012), Enow and Brijlal (2014), Gnanasooriyar (2014), Bulin, Basit and Hamza (2016), Salim and Yadav (2012), Lyngstadaas and Berg (2016), Mehta (2014), Padachi (2006), Agha (2014), Anser and Malik (2013), Wasiuzzama (2015), Pais and Gama (2015), Asaduzzaman and Chowdhury (2014), and Mawutor (2014), they determined the profitability by using ROA as the proxy.

Furthermore, some of the researchers which include Husain and Alnefaee (2016), Lazaridis and Tryfonidis (n.d.), Arbidane and Ignatjeva (2012), Saglam, Kagitci and Buyukipekci (2016), Alipour (2011), Mohamad and Saad (2010), Gill, Biger and Mathur (2010), Gnanasooriyar (2014), Ponsian, Chrispina, Tago and Mkiibi (2014), Perkovic (2012), Deloof (2003), Aggarwal and Chaudhary (2015) used

gross operation profit to determine the profitability. Besides that, there is only few researchers used return on equity as a proxy of profitability such as Aravind (2016), Samiloglu and Akgun (2016) and Gnanasooriyar (2014).

#### 2.2.1.1 Return on Assets (ROA)

According to Gnanasooriyar (2014), ROA is considered as the best measurement among return on equity, net profit, and gross profit in order to measure the firm's profitability. Mawutor (2014) used ROA as the proxy to measure firm profitability. Greater value of ROA is better as this proves that the company is earning more cash on its assets. A lesser ROA compared with the industry average indicates inefficient use of company's assets.

Besides, Jakpar et al. (2017) studied a set of samples of 164 manufacturing firms listed on the Main Board of Bursa Malaysia which covering of 5 years from 2007-2011. This study seeks to indicate how the firm performance in term of profitability was influenced by working capital management. ROA is also used as the proxy to determine the profitability. The cash conversion cycle (CCC), average collection period, inventory conversion period, and debt ratio are used as the exogenous variables. The researcher found out that CCC is insignificant to ROA.

The average collection period and inventories conversion period showed a significant positive relationship to profitability of the firm and similar to result of Agha (2014). This means that the longer the credit period granted by firm to their customers, the higher will be the profitability. The result is indifferent with Samiloglu and Demirgunes (2008) and Mansoori and Muhammad (2012) as average collection period, inventories conversion period and debt ratio showed a significant negative relationship to profitability of the firm and CCC is insignificant to ROA.

Despite of that, the findings of Mehta (2014) showed that CCC is negatively significant to ROA, while component of CCC, DSO is insignificant to ROA but DPO and DIO is negatively significant to ROA. Mansoori and Muhammad (2012) mentioned that negative relation in DPO to ROA is due to less profitable company need to get longer period to pay back the bills thus indirectly influencing the company's reputations and effect the firm's profitability.

### 2.2.2 Capital Structure

Profitability of a company is significantly influenced by a number of elements. Capital structure is considered as one of the important factors among others. In order to explore the relation between capital structure and firm's profitability, a lot of empirical studies had been done.

Gill et al. (2010) alleged that making capital structure decision is very important for organizations as it will affect the firm's profitability. The capital structure decision is significant and vital as it needs to enhance and maximize returns of the firms. Due to this reason, the capital structure decision has to be on the firm's ability to deal with its competitive environment. In general, firms have alternative to choose among the various sources of capital structures. For instance, firms can arrange lease financing, use warrants, issue convertible bonds, sign forward contracts or trade bond swaps. Firms can also decide to issue dozens of different securities in plenty combinations to maximize overall market value (Gill et al., 2010).

Chisti, Ali and Sangmi (2013), Hussain (2015), Angahar and Ivarave (2016), Anandasayanan and Subramaniam (2015), Salim and Yadav (2012), Shubita and Alsawalhah (2012), Negasa (2016) have determined the relationship between

capital structure and firm's profitability. All of their studies showed significant result toward profitability.

#### 2.2.2.1 Debt ratio (DEBT)

Shubita and Alsawalhah (2012) studied a sample of 39 companies with the period of six years revealed the significantly negative relation between DEBT and return on equity. On the other hand, Tufail et al. (2013) measured debt ratio in term of total debt to total equity as control variables to determine the firm profitability. The result still indicating a negative relationship between debt ratio and profitability although this research used a different measurement compared to others in which using total debt to total asset.

The study done by Salim and Yadav (2012) consisted of a sample 237 listed companies on Bursa Malaysia Stock Exchanges which covered from years 1995-2011 indicated that DEBT has a significant negative relationship with firm's profitability. Their result is supported by Zeitun and Tian (2007). The reason behind of having negative relationship is due to the company is threatened with default risk of having a higher loan. Therefore, when the debt or leverage increases, profitability of the firm tends to be decrease.

These results are accordance and similar to the findings of Azhagaiah and Gavoury (2011), Mohamad and Saad (2010), Jayarathne (2014), Garg and Gumbochuma (2015), Jakpar et al. (2017), Gill, Biger and Mathur (2011), Ng et al. (2017), Kasozi (2017), Gill et al. (2009), Rajan and Zingales (1995), Wasiuzzama (2015), Asaduzzaman and Chowdhury (2014), Bagchi et al. (2012), Alipour (2011), Mehta (2014), Aggarwal and Chaudhary (2015), Lyngstadaas and Berg (2016), Samiloglu and Demirgunes (2008) and Ferati and Ejupi (n.d.).

Nevertheless, there are some researchers showed that there should be positive relationship between DEBT and firm's profitability. Huynh and Jyh (2010), Enow and Brijlal (2014), Khan, Akash, Hamid and Hussain (2011) and Javid (2014) indicated debt ratio has positive association towards profitability. For example, Negasa (2016) make an empirical study on Ethiopian Large Private Manufacturing Firm. DEBT is used as a proxy to measure a corporation's capital structure and the result identified a positive relationship between DEBT and profitability. The researcher stated that the result is consistent with the relevance theory of the capital structure that firms can use debt to lower their cost of capital and maximize the firm's value. Static trade-off theory predicts a positive correlation between profitability and DEBT, since high performance firms have less expected bankruptcy costs.

On the other hand, Obert and Olawale (2010) also conducted a study on the relationship between DEBT and firms' profitability. However, the result showed insignificant relationship between these two variables. This result provided with the recommendation that selection of debt as a source of capital finance should be done in line with the costs and benefits associated with the use of debt. It was agreed by Anser and Malik (2013) and Mawutor (2014) in which they used debt ratio as control variables and found that it is insignificant in influencing the profitability.

### 2.2.3 Working capital management

According to Kasiran, Mohamad, and Chin (2016), Bagchi and Khamrui (2012), working capital management (WCM) act as one of the significant portion in firm's financing decision as it will trigger and influence the firm's performance. Mawutor (2014), Perkovic (2012), Anandasayanan et al. (2014), Zariyawati, Annuar, and Pui-San (2016) declared that a vital part in managing the working capital is to preserve its liquidity in daily operation to meet its obligation and the smooth

running. Mohamad and Saad (2010) further emphasized the importance and effectiveness of working capital management should be part of the company's strategic and operational processes. Requirement of working capital may be distinct over the nature of the firms. The excessive of working capital will weaken firm's profitability while the adequate working capital will threaten the solvency of the firm. Thus, working capital management might positively or negatively influence the successful functioning of a business firms by depending on the nature of the firms.

Most of the researches used DSO, DIO and DPO as the proxies to measure the working capital management which included Huynh and Jyh (2010), Nyamweno and Olweny (2014), Anser and Malik (2013), Jakpar et al. (2017), Jayarathne (2014), and Mohamad and Saad (2010). Various researches had been done in order to identify the relationship between working capital management and profitability, and the result suggested that policies of working capital management hostile enhance the profitability of firms (Gill et al., 2010; Abuzayed, 2012).

The result of some studies such as Abuzayed (2012), Khan et al. (2011), Aravind (2016), Mohamad and Saad (2010), Asaduzzaman and Chowdhury (2014), and Bulin et al. (2016), indicate that working capital management had influenced firms' profitability positively. However, Tufail et al. (2013) and Deloof (2003) obtained an opposite result in which they concluded that there should be negative relationship between working capital management and profitability.

#### 2.2.3.1 Days of Sales Outstanding (DSO)

DSO is one of the variables used to represent working capital in our research. To calculate this ratio, number of DSO has been used as proxy for the collection policy where the way of computation is accounts receivable divided by sales and then

multiplied by 365 days. It also called as average collection period that measure the average required days for changing the firm's receivable into cash or average number of days from collecting payment from the customers (Uchenna et al., 2012). Hence, the lower the DSO, the more liquid is the firm since they are able to get back the payment in shorter period. In this section, we will be reviewing on previous studies to observe whether DSO affect firm's profitability positively or negatively.

According to the findings from Wasuizzaman (2015), Ng et al. (2017), Bulin et al. (2016), Mawutor (2014), Alipour (2011), Deloof (2003), Javid (2014), Gill et al. (2010), Padachi (2006), Saghir et al. (2011), Aggarwal and Chaudhary (2015), Napompech (2012), Khan et al. (2011), Samiloglu and Akgun (2016), Lyngstadaas and Berg (2016), Pais and Gama (2015), Makori and Jagongo (2013), Kumaraswamy (2016), Kasozi (2017), Lazaridis and Tryfonidis (n.d.), Dong and Su (2010), Ponsian et al. (2014) and Akoto, Awunyo-Vitor and Angmor (2013), their result indicate a negative relationship between DSO and firm's profitability whereby increase in DSO will lead to firm profitability become lower.

This relationship was found as common expectation where it is important to shorter the period of collecting credit sales from customers so that the cash can be used for others viable investment opportunities (Wasuizzaman, 2015). His result was supported by Napompech (2012), where a longer time of collection of receivable indicates that cash is being tied up in receivable. If the firm faces this situation for a long-term period, it will decrease the firm available cash. Therefore, the authors suggested that the firm should speed up the receivable collection period so that the operation will not be impaired (Khan et al., 2011; Samiloglu & Akgun, 2016).

However, some researchers found a contrast relationship between DSO and firm's profitability. Based on the finding of Uchenna et al. (2012), Jakpar et al. (2017), Husain and Alnefaee (2016), Asaduzzaman and Chowdhury (2014), Abuzayed

(2012), Enow and Brijlal (2014), positive relationship should be existing between DSO and profitability of the firm where longer in DSO will lead to firm's profitability to become higher. This is contradicting with the corporate finance theory in which saying that the shorter the number of days of account receivable, the more profitability of the firm (Asaduzzaman & Chowdhury, 2014). On the other hand, Husain and Alnefaee (2016) found that DSO has no significant impact on firms' profitability.

#### 2.2.3.2 Days of Inventory Outstanding (DIO)

The relationship between DIO and profitability of firms were well studied in different environment. For example, Makori and Jogongo (2013) examined the effect of working capital management on firms' profitability in which using balanced panel data of five manufacturing and construction firms from year 2003 to 2012. Another research was done by Kumaraswamy (2016) which aimed to find out the impact of working capital management on cement manufacturing firms performance for period of 2008 to 2014 also utilized DIO as one of their independent variable.

Theoretically, DIO should have a negative relationship with a corporation's profitability. However, based on the research done by previous researchers, the relationship between these two variables is not consistent. For instances, empirical finding from Samiloglu and Demingunes (2008) identified that DIO affect firm profitability negatively. Their sample are based on Istanbul Stock Exchange (ISE) listed companies from year 1998 to year 2007. The same result had been found by Mehta (2014). Both researches use the same variables. The difference was that Samiloglu and Demingunes (2008) did the study based on manufacturing firms while Mehta (2014) is based on real estate and construction sector.

On top of that, Dong and Su (2010) also declared the same relationship. However, the dependent variable of this study is gross operation profit, while research from Samiloglu and Demingunes (2008) and Mehta (2014) are based on ROA. Other than above studies, there are a number of studies also obtained the same result. The examples are such as Ponsian et al. (2014), Bulin et al. (2016), Husain and Alnefaee (2016), Nishathini and Nimalathasan (2013), Wasuizzaman (2015), Napompech (2012), Saghir et al. (2011), Alipour (2011), Deloof (2003), Aggarwal and Chaudhary (2015), Samiloglu and Akgun (2016), Lyngstadaas and Berg (2016) and Pais and Gama (2015).

On the other hand, there are researches indicated that there should be a positive relationship between DIO and firm's profitability. According to Jakpar et al. (2017) which covered from year 2007 to year 2011 by using 164 manufacturing firms listed in Bursa Malaysia, they declared DIO is positively significant to firm profitability. Their result is supported by Kasozi (2017), Arunkumar and Radharamanan (2012) and Mawutor (2014) which also studied on manufacturing firms but in different countries which are in South Africa, Indian and Ghana respectively. In addition, Agha (2014) which mainly studied in pharmaceutical company also obtained the same result. The positive relationship between DIO and profitability are supported by researches from Makori and Jogongo (2013), Kumaraswamy (2016), Ng et al. (2017), Padachi (2006), Asaduzzaman and Chowdhury (2014), Khan et al. (2011).

However, some researchers found that the relationship between DIO and firm profitability are insignificant. Study from Gill et al. (2010) based on 88 American firms from year 2005 to 2007 declared that no significant relationship between these two variables. Moreover, Akoto et al. (2013) and Javid (2014) also showed that no relationship exists between DIO and firm's profitability.

#### 2.2.3.3 Days of Payable Outstanding (DPO)

Deloof (2003) investigated a sample of 1,009 large Belgian non-financial firms for the period of 1992-1996. The finding showed a highly significant negative relationship between profitability and DPO. This can be explained by less profitable firm takes longer time to pay their bills in order to take advantage of credit period granted by their suppliers. According to Lyngstadaas and Berg (2016), the cost of extended trade credit will be included in the cost of goods. Thus, reducing trade credit and paying bills earlier will lower the cost of goods, for example by receiving early payment discounts. This explains the negative relationship between account payable days and profitability as found in their study on Norwegian small and medium-sized enterprises for the period of 2010 to 2013. The inverse relationship between account payable days and profitability are supported by the studies of Pais and Gama (2015), Wasuizzaman (2015), Enow and Brijlal (2014), Alipor (2011), Javid (2014), Padachi (2006), Husain and Alnefaee (2016), Napompech (2012), Samiloglu and Akgun (2016), Mawutor (2014), Abuzayed (2012) and Lazaridis and Tryfonidis (2006).

It is contrary with the study of Mathuva (2010) that analyses a sample of 30 firms listed in Nairobi Stock Exchange for the period of 1993 to 2008 by using both pooled OLS and fixed effects regression model. He found significantly positive relationship between DPO and profitability (ROA) that can be explained in two ways. Firstly, more profitable firms wait longer to pay their bill to suppliers in order to take advantages of the funds available for their working capital needs. Secondly, this result makes economic sense as working capital management rule states that firms should delay their payments as much as possible without spoiling their business relationship. The longer a firm prolong its payment, the more the working capital it reserves to be used in increasing sales and thus boost profit. This is supported by the findings of Makori and Jagongo (2013) that studied on listed

manufacturing and construction firms on Nairobi Securities Exchange, Kenya and Aggarwal and Chaudhary (2015) on Indians firms.

On the other hand, Akoto et al. (2013) investigated the effects of working capital management on the profitability of 13 listed manufacturing firms in Ghana from 2005-2009 using panel data methodology. They found that accounts payable days show statistically insignificant positive relationship with profitability, proving prolonged accounts payable days helps in explaining the financial success of listed manufacturing firms in Ghana, but it is not a main factor to take account in improving profitability. The result is similar with Gill et al. (2010) that studied a sample of listed United States manufacturing firms.

## 2.3 Research Framework

Based on our literature research, majority of the researchers used trade off theory and pecking order theory as their empirical approaches to study the effect of working capital management and capital structure on firm's profitability. However, this relationship has no achieved consensus between them.

### 2.3.1 Modigliani and Miller Theory

According to Modigliani and Miller Theory, securities issued by companies will be traded in perfect capital market. This theory provides understanding on how taxes and financial distress will affect a company's capital structure decision. Some assumptions are embedded under this theory which include there is no taxes, no bankruptcy cost, no transaction costs, no asymmetric information, no effect of debt on a firm's earnings before interest and taxes, same borrowing cost for both

companies and investors. Despite these assumptions seem unrealistic, they help us to go through the effect of capital structure decision.

There are two propositions under this theory, which are Modigliani and Miller Proposition I and II. Proposition I mainly focus on no tax conditions. The market value of company will not affect by the capital structure of the company (Addae, Nyarko & Hughes, 2013). In the other words, market value of company is not related to the debt bear by company. As there is no interest deductibility, hence, there is no advantage to borrow at firm level. On the other hand, proposition II pressures on the linear function between cost of equity and company debt to equity ratio (Jensen, 1986). When increase the debt amount in firm's capital structure, its return on equity to shareholders will also increase in a linear form. Higher debt levels in the company make investment seem to be more risky. As a result, shareholders will demand on a greater risk premium on company's stock.

Although Modigliani and Miller Theory cannot be applied in the real-world condition, but it had contributed to future study of theorists in order to have a deeper sight in capital structure theorem. Following by this theory, there are three theories emerged after modification of this theory which able to apply in real world, which are Trade off Theory, Pecking Order Theory, and Cash Conversion Cycle (CCC) Theory.

### 2.3.2 Trade off Theory

Trade off Theory is the concept of a company to select the amount of equity finance and debt finance should be used respectively in order to balance the costs and advantages. According to Glover and Hambusch (2014) this theory presumes that a manager places a target debt ratio to trade off the cost (bankruptcy cost) and benefits (tax advantages) in term of debt financing. Based on this theory, debt

financing is more preferable for company to enhance their earning if compare with equity financing (Ting & Lean, 2011). The reason is debt viewed as an advantage when corporate income tax is added as it functions to neutralize the imputation tax system. The interest payments on debt are deductible. Hence, company more likely to use debt financing up to the point which the likelihood of bankruptcy become large enough to offset tax advantage of using debt. This theory provides a summary of connection between company value and capital structure. Modigliani and Miller (1958) indicated that the net effect of taxes on company value will be equal to zero when both corporate and personal taxes are taking into account.

Trade off Theory predicts there is a positive relationship between firm profitability and leverage (Glover & Hambusch, 2014). This is in contrast to Pecking Order Theory. Based on the research done by Wahab and Ramli (2014), they found that positive relationship between firm profitability and leverage is existed because of the usage of debt able to provide benefits to the firms in term of tax shield on interest payments. This finding is same with the result from Jaisinghani and Kanjilal (2017). They also found that the benefit of debt which could enjoy by companies is the tax shield advantage related to it. This is because the interest paid to debt holders can be deducted from the gross profits before computing the tax liability of the firm in most of the countries. However, according to Frank and Goyal (2009), they disputed there should be negative relationship between firm profitability and leverage. The reason is firms do not adjust the capital structure instantaneously when decreased in debt and incremental in equity are noticed.

According to this theory, firms with high profitability should consist of more debt as the expected tax shield is higher and the expected bankruptcy costs are lower (Glover & Hambusch, 2014). On the other hand, this theory mentioned that the raise of debt level may shrink the value of the company by the incremental of agency cost and financial distress. For example, the firms will face higher cost of bankruptcy if they are unable to perform their interest payment obligation

especially during economy recession. Thus, it is a must for a firm to find for the equilibrium in which the debt level capable to counterbalance its cost (Wahab & Ramli, 2014). In the other words, the benefits and costs of debt should be assessed in proper way to attain at the optimal capital structure. When a firm is stated at maximum value in term of debts, the more debt usage will become an additional cost to the company (Ahmad & Rahim, 2013).

### 2.3.3 Pecking Order Theory

Pecking Order Theory which was developed after the Trade-off Theory had become popular financial principle which supports companies to select their capital structure in term of discussing firms' financing behavior. This theory is mainly based on asymmetric information problems. According to Myers (1984), companies do not have well defined ideal debt ratio. This is contrast with Trade off Theory which expects a company will adjust toward a specific debt ratio. At the same time, this theory presumes firms will follow a hierarchical order of financing preferences. The first category is always from internal financing which is using retained earnings. When internal financing is depleted, firms will choose to use external financing which refer to debt and equity. However, firms will issue debt first if compare to equity. Equity is only issued as a last resort (De Jong, Verbek & Verwijmeren, 2010).

Based on this theory, information asymmetry existed between a firm and outside investor regarding to the real value of current operations and prediction in coming period. The company with smaller size have higher tendency for information asymmetric to take place if compare with larger firms. According to the study done by De Jong et al. (2010), they found that external capital which refer to debt and equity are considered as more costly if compare with internal financing such as

using retain earnings. On top of that, potential dilution of ownership might also occur if external fund is raised by the firm.

Information asymmetry will result in mispricing of firm equity in the market and causing existing shareholders might lose their wealth. This is due to managers or insiders have more information about firm financial condition and future growth opportunities than investors (Myers and Majluf, 1984). Myers and Majluf (1984) further claimed that the securities of the firm will be underpriced if the particular firms funding the new projects through issuing new securities as it are impossible for managers to credibly express the potential investments opportunities and their existing assets to prospective investors. Consequently, outsiders may not able to differentiate between bad and good projects and thus inferring issuing of new securities as a bad sign to the company and pricing the new securities accordingly. As a result, the firms can only issue the equity at a discount or the investors will require a premium to invest in order to compensate the risk they are taken.

Pecking Order Theory assumes there is a negative relationship between profitability and debt level. In other words, it can be said that a firm with a higher debt ratio would have lower profitability and vice versa. This finding is confirmed by the research from Rajan and Zingales (1995). At the same time, the study from Booth, Aivazian, Demirgue Kunt and Maksimovic (2001) on developing countries also obtained the same result. Thus, profitable firms which consist of numerous retained earnings will not depend on external financing due to asymmetric information problem (Jakpar et al., 2017). As a result, this theory suggests firms to use internal funds in priority to perform debt obligation in order to overcome with the problem which may affect the firm's value.

In its simplest form, the pecking order model of corporate financing says that a firm will issue debt if there is an inadequacy of internal cash for its real investment

and dividend commitments. Equity is never issued, except possibly when the firm can only issue junk debt and costs of financial distress are high.

### 2.3.4 Cash Conversion Cycle (CCC) Theory

Cash Conversion Cycle (CCC) Theory was initiated by Richards and Laughlin. According to this theory, CCC which related with current assets and current liabilities are most time consuming and important part when managers make decision. CCC theory is mainly explaining on cycles which start with acquisition of raw materials, transformation or emergence of new products, follow by collection of receivables from debtor and make payment to creditors. In the other words, this theory is the most crucial in explaining working capital management as it concerned with all concepts and components (Aminu & Zainudin, 2015). CCC is represented as followed:

$$CCC = DSO + DIO – DPO$$

Where, DSO = a proxy for receivable management
DIO = a proxy for inventory management
DPO = a proxy for payables

According to this theory, there should be a negative relationship between DSO and profitability. At the same time, negative relationship also exists between DIO and profitability. The main purpose of this theory is used to analyze corporations' working capital management efficiency. A company with efficient working capital management will have higher liquidity and profitability, while inefficient working capital management will result in lesser profitability and lower firm value (Oseifuah & Gyekye, 2016).

## 2.4 Proposed Theoretical/ Conceptual Framework

Some basic knowledge about the effect of working capital management and capital structure on firm's profitability had been get in the previous part. In this part, conceptual framework will be proposed in order to study the effect of working capital management and capital structure on firm's profitability of Malaysia listed manufacturing firms from year 2006 to year 2016. The left-hand side variable is ROA, while the right-hand side variables are DSO, DIO, DPO and debt ratio.

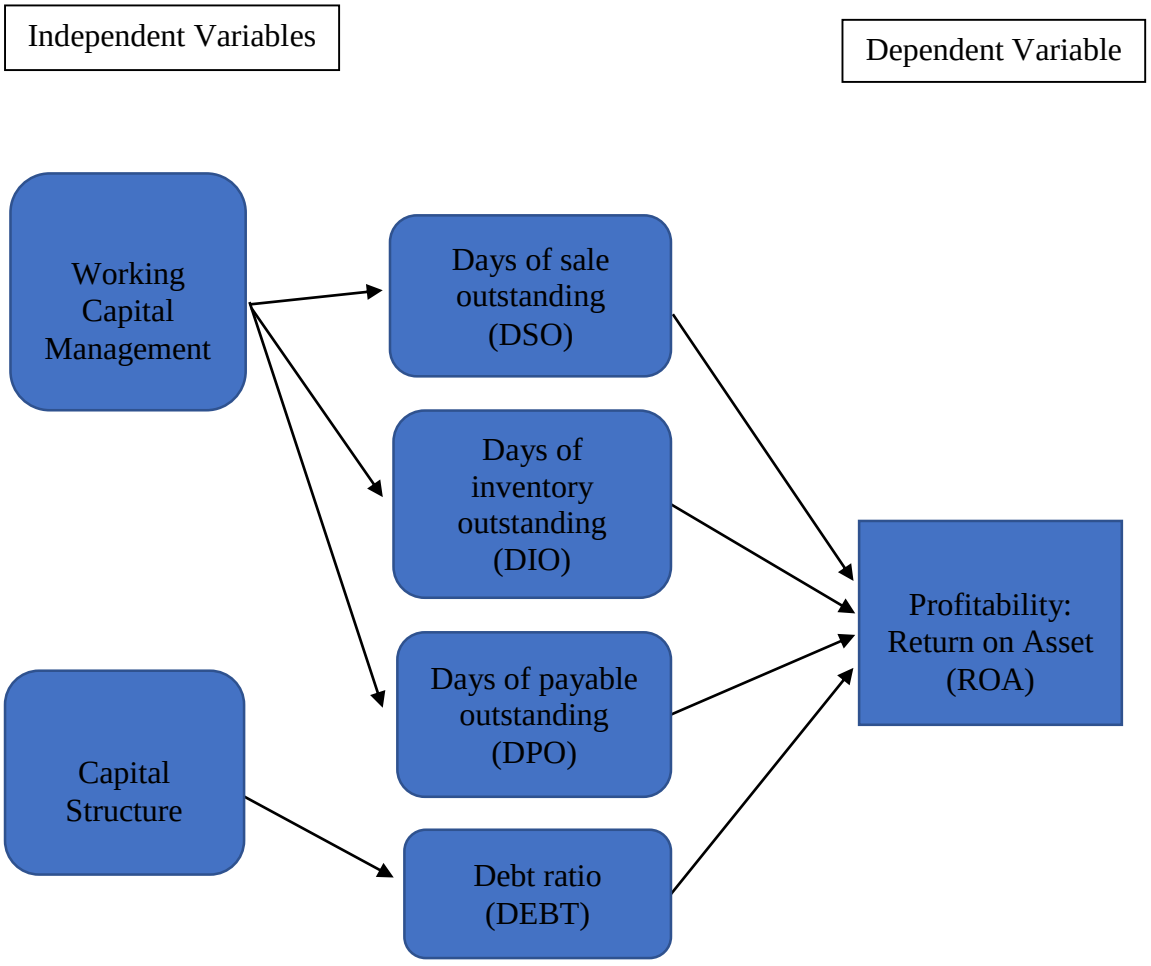



Figure 2.1 Expected relationships between independent variables towards dependent variable.

### 2.4.1 Expected sign and Explanation of Indicators

Table 2.1: Expected Sign and Explanation of Indicators

| Indicators | Expected Sign | Explanation |
|---|---|---|
| DEBT | Negative (-) | Increased in debt ratio will reduce firm's profitability. |
| DSO | Negative (-) | The higher the DSO, the lower the firm's profitability. |
| DIO | Negative (-) | The higher the DIO, the lower the firm's profitability. |
| DPO | Negative (-) | The higher the DPO, the lower the firm's profitability. |

*Note: DEBT refer to debt ratio, DSO indicate days of sales outstanding, DIO is days of inventory outstanding, and DPO represent days of payable outstanding,

Firm's profitability (ROA) is significantly influenced by numerous factors which include working capital and capital structure of the company. In this research, we had chosen DSO, DIO and DPO as the indicators for our working capital while capital structure was determined by DEBT in order for us to investigate their relationship with firm's profitability. To discover if there is any relationship to be positive, negative or no relation between them, a number of empirical studies have been done where it produces a miscellaneous result.

Debt is the mostly used as determiner for capital structure in the previous studies. Refer to the studies of Negasa (2016), it showed the result of positive relationship between debt and ROA where it is consistent with the suggested theory saying that the firm can use debt to reduce their cost of capital and maximize the firm's performance. On the other hand, Obert and Olawale (2010), Salim and Yadav (2012), Zeitun and Tian (2007), Nazir and Afza (2009), Mohamad and Saad (2010), Ng et al. (2017), Jakpar et al. (2017), Makori and Jagongo (2013), Hoang (2015) and Mansoori and Muhammad (2012) obtained a result of negative relationship between debt and ROA. They argued the theory of using debt to reduce their cost of capital and stated that choosing debt as a sources of capital finance should be in line with the firm's ability. This is because if the firms did not able to repay its debt, it can influence the firm' value and most seriously the firm will go to bankruptcy (Obert & Olawale, 2010; Hoang, 2015). Therefore, we expected a negative relationship between debt and ROA.

DSO is one of the independent variable that widely used by researchers to determine the working capital of a firm. According to Yogendrarajah and Thanabalasingan (2014), it showed the result of positive relationship between DSO and ROA. However, Wasuizzaman (2015), Makori and Jagongo (2013), Jakpar et al. (2017), Hoang (2015), Bagchi and Khamrui (2012), Mawutor (2014), Anandasayan et al. (2012) and Mansoori and Muhammad (2012) found that there is negative relationship between DSO and ROA whereby increase in DSO will cause ROA to become lower. This is consistent with the understanding where the longer the receivable period, the more financing sources are invested in working capital. This will lead to additional opportunity costs of extra financing increase and less sales to be occur (Hoang, 2015). When there is decrease in sales, the firm's profitability will become lower. Therefore, we expected that DSO is significantly negative on ROA.

Besides that, there are arguments saying that the relationship between a firm's DIO and ROA can be positive or negative. This is because holding the inventory help firm to diminish the problem of stock running out and to deal with high demand but there is also some cost involved such as ordering and carrying cost (Wasuizzaman, 2015). Based on the study of Ng et al. (2017), Jakpar et al. (2017), Makori and Jagongo (2013) and Mawutor (2014), it showed positive relationship between DIO and firm's ROA whereby increase in inventory is related to product demand. Hence, it further linked to firm's sale and profitability. However, the research from Wasuizzaman (2015), Hoang (2015), Yogendrarajah and Thanabalasingan (2014), Anandasayan et al. (2012) and Mansoori and Muhammad (2012) found that there is negative relationship between DIO and ROA whereby shorter period of inventory conversion period is more profitable. In the other word, there will be less cash invested when holding less inventory so that more cash is freed to be invested in fixed assets or other investments that bring in more return and higher profitability (Wasuizzaman, 2015). Hence, we expected that DIO is significantly negative on ROA.

Moreover, DPO is expected a negative sign on ROA. Although some of the studies like Ng et al. (2017), Makori and Jagongo (2013), Yogendrarajah and Thanabalasingan (2014) and Anandasayan et al. (2012) found that DPO and ROA are positively related. However, this relationship is weak because based on the result from Ng et al. (2017), Anandasayan et al. (2012), Yogendrarajah and Thanabalasingan (2014), it showed that it is not statistically significant and the firms take longer time to pay their bills will affect their creditworthy in long-term and its profitability. Therefore, a negative sign is expected in this relationship which is consistent with the research from Wasuizzaman (2015), Mansoori and Muhammad (2012), Hoang (2015) and Mawutor (2014) where it presented a negative relationship between DPO and ROA. By way of explanation, paying off the creditors earlier will enable suppliers to provide

good quality of product and service that bring benefit to the firm's customers and as the results, firm's performance will be improved (Hoang, 2015).

## 2.5 Hypothesis Development

Before we conduct our data analysis, we have developed the hypothesis for our independent variables- DSO, DIO, DPO and DEBT in our study.

$H_0$: $\beta_1 = 0$, Debt ratio (DEBT) does not significantly influence the firm's profitability.
$H_1$: $\beta_1 \neq 0$, Debt ratio (DEBT) does significantly influence the firm's profitability.

$H_0$: $\beta_1 = 0$, Days of sale outstanding (DSO) does not significantly influence the firm's profitability.
$H_1$: $\beta_1 \neq 0$, Days of sale outstanding (DSO) does significantly influence the firm's profitability.

$H_0$: $\beta_1 = 0$, Days of inventory outstanding (DIO) does not significantly influence the firm's profitability.
$H_1$: $\beta_1 \neq 0$, Days of inventory outstanding (DIO) does significantly influence the firm's profitability.

$H_0$: $\beta_1 = 0$, Days of payable outstanding (DPO) does not significantly influence the firm's profitability.
$H_1$: $\beta_1 \neq 0$, Days of payable outstanding (DPO) does significantly influence the firm's profitability.

## 2.6 Conclusion

In a nutshell, this chapter had studied all of the empirical studies on dependent variables and independent variables based on previous researcher's findings. Some results of researchers have met with their expected sign however some are not. This had given us a clear review between working capital management and capital structure towards profitability. The theories and conceptual framework for this study also has been listed and formed. In next chapter, method which used for this study will be covered.

# CHAPTER 3: METHODOLOGY

## 3.0 Introduction

In this segment, we are going to further discuss about the research methodology. The empirical framework, research design, data collection method, rationale of choosing the variables and econometric method will explain in detail subsequently. The exogenous variables involved in this study are DEBT, DSO, DIO as well as DPO whereas ROA ratio is selected as the proxy of profitability on the 57 public listed manufacturing firms in Malaysia for the research duration of 2006 to 2016.

## 3.1 Empirical Framework

### 3.1.1 Model Specification

After going through the literature research, most researchers used ROA as accounting measure of firm performance. In the study, ROA is termed as explained variable, while CCC as the proxy of working capital component and debt ratio as proxy of capital structure component has been selected as independent variables of the model. The relationship between working capital and capital structure with firm profitability was examined in general regression model that employed by Mawutor (2014) as follows:

$$\mathbf{ROA}_{it} = \beta_0 + \beta_n X_{it} + \mu$$

Thus,

$$\mathbf{ROA}_{it} = \beta_0 + \beta_1 \mathbf{DEBT}_{it} + \beta_2 \mathbf{CCC}_{it} + \mu_{it}$$

According to Mawutor (2014), Yogendrarajah and Thanabalasingan (2014) and Wasuizzaman (2015), to comprehensively measure working capital management, CCC is calculated by DSO plus DIO minus DPO.

$$CCC = f(DSO, DIO, DPO)$$

By substituting and incorporating the CCC formula into the regression model, a new panel data regression model is formed as follows:

$$\mathbf{ROA}_{it} = \beta_0 + \beta_1\mathbf{DEBT}_{it} + \beta_2\mathbf{DSO}_{it} + \beta_3\mathbf{DIO}_{it} + \beta_4\mathbf{DPO}_{it} + \mu_{it}$$

where:

$ROA_{it}$ = Return on assets of company *i* in year *t*

$DEBT_{it}$ = Debt ratio of company *i* in year *t*

$DSO_{it}$ = Days sales outstanding of company *i* in year *t*

$DIO_{it}$ = Days inventory outstanding of company *i* in year *t*

$DPO_{it}$ = Account payable turnover days of company *i* in year *t*

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$= Regression model coefficient

$\mu_{it}$ = Error term of the model

i = company, ranging from 1 to 57

t = years, ranging from 1 to 11

In order to achieve the objectives of the study, a new model is formed, which indicates the firm profitability is explained by the proxies of working capital and capital structure and the model was tested by using panel ordinary least squares (POLS) analysis.

## 3.2 Research Design

Our research objectives can be reached by using quantitative study. Quantitative methods deal with objective measurements and the statistical, mathematical, or numerical analysis of data obtained through polls, questionnaires, and surveys, or by utilizing preceding empirical data using computational skills (Babbie, 2010). This method focuses on collecting numerical data and drawing broad inferences on a particular phenomenon from particular observations. In other words, it is used to examine and quantify relationship between variables mathematically through statistical analysis from a sample to the population of interest. Besides, causal research is to be conducted to identify the extent and nature of cause-and-effect relationships of ROA in relation to DEBT, DSO, DIO and DPO respectively for the 57 manufacturing firms listed in Bursa Malaysia. In the study, we will analyze and explain the patterns of the relationships exist between variables with the proof established on the basis of quantitative findings.

## 3.3 Data Collection Method

The balance panel data has been used in this study for a period of 2006-2016. The study focuses on the manufacturing firms in Malaysia that is public listed in Bursa Malaysia. Potential determinants of firm profitability incorporated into the analysis of this paper include DEBT, DIO, DSO and DPO. The secondary data of 100 companies were retrieved but only 57 manufacturing firms was chosen for the study while the remaining is eliminated due to unavailability of vital data.

Table 3.1: Measurement and data source of the variables.

| Variables | Measurement | Source of Data |
|---|---|---|
| **ROA** | TTM Net Income / Average Total Assets * 100 | Bloomberg |
| **DEBT** | Total Debt *100 / Total Assets | Bloomberg |
| **DSO** | Average Account Receivable / TTM Sales * Number of days in the period | Bloomberg |
| **DIO** | Average Inventory / TTM Cost of Goods Sold * Number of days in the period | Bloomberg |
| **DPO** | Account Payable/ TTM Purchases * Number of days in the period | Bloomberg |

## 3.4 Rationale behind Choosing the Variables

Profitability is the utmost and common measure of an organizational growth and progress in terms of its efficiency and productivity. Profitability is quantified in this study by ROA to represent financial strength among the 57 manufacturing companies in Malaysia. Profitability indicates the company's ability to generate profits by operating the business for the particular period. The principal of conducting the operational activity is through the various sources of fund. The firms must ensure their liquidity fund is available and well maintained in a certain level to run the business activities.

One of the sources of funding is debt financing. The leverage ratio is employed to determine the degree of debt financing on the assets of a company. The greater the debts obtain, the higher the possibility of a company unable to meet its obligation. In other words, capital structure increases the chances of financial distress and bankruptcy. According to Huynh and Jyh (2010), Enow and Brijlal (2014), Khan et al. (2011), Javid (2014), Salim and Yadav (2012), Zeitun and Tian (2007), Nazir and Afza (2009), Mohamad and Saad (2010), Ng et al. (2017), Jakpar et al. (2017), Makori and Jagongo (2013), Hoang (2015) and Mansoori and Muhammad (2012), DEBT is a significant determinant of firm's profitability. Although employing debt financing might reduce their cost of capital, the company's ability to fulfill and repay the obligation should be considered. When they unable to service the debts, it able to influence the firm' value and causing bankruptcy (Obert & Olawale, 2010; Hoang, 2015).

Another source of firm's fund is working capital. A business uses working capital in its daily operations. Similar to the other business sectors, efficient management of working capital is equally important for manufacturing sector as well to generate more profit. A manufacturing firm need to deal with accounts payables and accounts receivables routinely and conduct daily activities for purchasing raw materials and for selling products at the same time. In the study, CCC is used to represent working capital. According to Richards and Laughlin (1980), all relevant cash flows come from the operations should consider as the cash conversion cycle which includes account receivables, inventory, and account payables. Extensive researches have been conducted by treating DSO, DIO and DPO separately as three explanatory variables in order to study their respective effect on firm's profitability (Makori & Jagongo, 2013; Kumaraswamy, 2016; Kasozi, 2017; Arunkumar & Radharamanan, 2012; Lazaridis & Tryfonidis, 2016; Ponsian et al., 2014, Mawutor, 2014). Their research findings have concluded almost with the same findings and indicated that they are significantly determining the firms' profitability level.

In a nutshell, these four independent variables are playing vital roles in terms of capital structure and working capital management to boost the operational efficiency of firms and their profitability eventually. Therefore, the study has included them to analyze their impacts on the profitability of the 57 listed manufacturing firms in Malaysia.

## 3.5 Econometric Method

The study uses panel data analysis to examine and estimate the impacts of working capital and capital structure on firm performance.

### 3.5.1 Panel Data Analysis

Panel or longitudinal data is data set that consists a sample of cross sectional of individual, households, firms or countries over several time series, and thus it provides repeated observation of each individual in the sample (Baltagi, 2013). The data collected by surveying a larger number of individuals over a short time period, which *N* (cross-section dimension) is larger than *T* (temporal dimension), is known as micro panel. In contrast, data collected for a number of individuals which is approximately equal to number of time periods is known as macro panel. In addition, panel data can be categorized to balanced panel data and unbalanced panel data. Balanced panel data contains parallel number of observations for each individual whereas unbalanced panel data has unequal number of observations for each individual. Apparently, micro panel with balanced panel data was used in the study as it contains annual data of 57 firms in Malaysia for 11 years.

According to Klevmarken and Hsiao (as cited in Baltagi, 2013), panel data possesses several benefits, including the utilization of panel data enables to limit the individual heterogeneity since individuals, households, firms, cities or countries are heterogeneous. By using panel data, it is able to control for state-invariant or time-invariant variables whereas the time series and cross section data unable to control such heterogeneity that will lead to bias in results. In other word, it controls the effect of omitted variables in the model which are correlated with the explanatory variable. Panel data with information on both the inter-temporal dynamics and the distinctiveness of the entities allow us to limit the impacts of omitted or unobserved variables. Besides, panel data contains more sample variation, more informative data, higher degree of freedoms and reduce the collinearity among the variables than cross sectional data, results to more reliable parameter estimates.

By considering the advantages and limitations of panel data analysis, we choose panel methodology as it improves the precision of parameter estimates. Panel data analysis enables us to examine the effects of working capital and capital structure on firm performance, by sorting out model temporal effects without bias.

### 3.5.2 Panel Unit Root Test

Panel unit root testing are originated from time series unit root testing. Panel unit root or stationarity test has become well-known and commonly used for the past decade. The purpose of this test is to verify whether the panel data set is non-stationary as non-stationarity of variables will lead to spurious estimates if you are estimating a static panel model. As a result, the estimation method might produce a statistically significant relation between two variables,

irrespective of whether such a relation exists or not (Granger & Newbold, 1974). The basic structure constructed for panel unit root testing method is

$$\Delta y_{it} = \rho_i y_{i,t-1} + \sum_{l=1}^{p_i} \emptyset_{i,l} \Delta y_{i,t-1} + \alpha_i d_{it} + \varepsilon_{it}$$

Where, $d_{it}$ are the deterministic constituents; $\rho_i = 0$ imply that the $y$ process included a unit root for individual $i$, whereas $\rho_i < 0$ signify that the process is stationary around the deterministic components.

The foremost benefit of implementing panel unit root tests is they are dramatically useful compared to the standard time-series unit root tests in finite samples as it combines a cross-section of individual time-series when studying across the economic issues. Besides, the insufficient of period of time series data would result in precluding the study of many hypotheses of interest. We are able to develop the more precise parameter estimates as the panel unit root tests are depending on the total variation in the data used which provide substantial information to the study. In this study, we have included Levin, Lin and Chu (LLC) test and Augmented Dickey-Fuller (ADF) method to examine the stationarity of the variables.

#### 3.5.2.1 Levin, Lin and Chu Test (LLC)

LLC test is the first test presented in this paper where the test is proposed by Levin, Lin and Chu (2002). The variable observed in our study is on 57 companies and 11 periods with individual effect and time trend. LLC test assumes that first order serial correlation coefficient is required to be homogenous in all units under the alternative hypothesis, $\rho_i = \rho$ for all $i$ (Levin

et al., 2002). Besides, LLC test claims that in the individual unit root test, there is a limited power against the alternative hypothesis whereby when the null hypothesis is false, they have the ability to reject it. Therefore, a more powerful panel unit root test was suggested by LLC with the following assumptions. According to Levin et al. (2002), LLC test assumes that the coefficient of lagged dependent variable is restricted to be homogenous across all units of the panel. However, the error term is assumed to be independent across the units of sample (Im, Pesaran & Shin, 2003).

By using LLC test, we can develop hypothesis whereby there is a unit root under the null hypothesis, while there is no unit root under the alternative hypothesis which can be written as

$$H_0 : \rho_i = 0 \text{ for all } i$$
$$H_1 : \rho_i < 0 \text{ for all } i$$

Unfortunately, Levin et al. (2002) found that there are some limitations of LLC test. Firstly, some of the contemporaneous correlation failed to be eliminated through the deducting of the cross-sectional averages. Thus, it is not applicable in using LLC test when there is cross sectional correlation exists. This is because the independence assumption across individual is a crucial dependent by the test. Secondly, the autoregressive parameters or all individuals are considered being identical across the panel is the major limitation of LLC. The reason is because some of the readers are refer to Im et al. (2002) where it does not have the assumption of identical first order correlation under the alternative hypothesis for panel unit root test (Levin et al., 2002).

### 3.5.2.2 Augmented Dickey–Fuller (ADF) - Fisher test

Dickey Fuller test examines whether a variable has unit root, which is equivalent to, the variable follows a random walk. For a more complex and larger time series model, ADF test is expanded from original Dickey Fuller test. Fisher test is a panel unit root test proposed by Maddala and Wu (1999) to examine the stationary of the unit root that combines the p-values of the individual statistics. The null hypothesis states that there is unit root (variable is non-stationary), while alternative hypothesis indicates there is no unit root (variable is stationary) in some cross-sections variable.

For the Fisher test, ADF test is applied for each individual series.

$$\text{Drift model: } \Delta y_{i,t} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j-1}^{p} \gamma_{ij} \Delta y_{i,t-1} + \text{residual}$$

$$\text{Trend model: } \Delta y_{i,t} = \alpha_i + \delta_{it} + \rho_i y_{i,t-1} + \sum_{j-1}^{p} \gamma_i \Delta y_{i,t-1} + \text{residual}$$

The null hypothesis states that there is unit root (variable is non-stationary), while alternative hypothesis indicates there is no unit root (variable is stationary) in some cross-sections variable.

$$H_0 : \rho_i = 0, \text{ for all I}$$

$$H_1 : \rho_i = 0 \text{ for } i = 1,2,..,N$$

$$\rho_i < 0 \text{ for } i = N+1, N+2,\ldots,N$$

The strengths of the ADF Fisher test derive from its simplicity, the flexibility to statistic choice, lag length and sample size, as well as the ease of handling unbalanced panel data. Besides, ADF Fisher test is more powerful than both the Levin-Lin-Chu test and Im-Pesaran-Shin test, especially for the cases that

stationary and non-stationary series are included in the group as alternative hypothesis, because of its ability in distinguishing the null and the alternative. However, the drawback of the test is that the p-values has to be derived from Monte Carlo simulation (Maddala & Wu, 1999). Furthermore, the assumption of ADF Fisher test that the panel units cross-sectional independence is relatively restrictive. The chi-square distributed with $2N$ degrees of freedom ($Ti \rightarrow \infty$ for finite $N$) where we denote this as the advantage of the test since infinite $N$ is unrealistic in practical situation, especially in macroeconomic panel (Lupi, 2011).

## 3.5.3 Panel Data Regression Model

The three types of panel regression model include Pooled Ordinary Least Square (POLS) Model, Fixed Effect Model (FEM) and Random Effects Model (REM). In order to solve the issue of selecting the panel data model, we are going to carry out Lagrange Multiplier (LM) test, Likelihood test, and Hausman test.

### 3.5.3.1 Pooled Ordinary Least Square Model (POLS)

Generally, POLS estimation is simply an ordinary least square (OLS) technique to run on panel data. If the individual effect does not stand, OLS method will produce efficient and consistent parameters estimates (Gujarati & Porter, 2009).

POLS method assumes that the explanatory variables are exogenous. The disturbances in the model are not correlated with any explanatory variable. A variable is considered strictly exogenous if it is uncorrelated to the current, past,

and future values of the error term. Besides, the error term must be independently and identically distributed with zero mean and constant variance. The main issue with POLS model is that it does not take into account the unobservable, or heterogeneity effects. In other words, the individuality of each subject is subsumed in the disturbance term. If the unobserved cross-sectional error term or the unobserved time-variant error term are correlated with the observed variables, the error term may be correlated with some of the explanatory variables included in the model (Gujarati & Porter, 2009). As a consequence, the estimated coefficients may be biased and inconsistent.

To determine whether pooled OLS is the appropriate model, LM test is carried out by developing the hypothesis testing as follow:

$H_0$: $\sigma_\varepsilon^2 = 0$ (POLS is preferable)
$H_1$: $\sigma_\varepsilon^2 \neq 0$ (REM is preferable)

In the case of not rejecting null hypothesis which means random effect is zero, POLS model is applicable in this context.

#### 3.5.3.2 Fixed Effect Model (FEM)

When the individual-specific intercepts are correlated with one or more regressors, FEM is the model that appropriate to be used. In FEM, it is permissible that the intercept in the regression model is vary among the individual where in other words it is assumed to be independent. This is because respectively individual may have its own special characteristic and different behavior. However, there consists of disadvantages of using FEM that lead to some problems. One of them is when the number of cross-sectional units, *N*, is very huge, it will consume a lot of degree of freedom which will lead to the

issue of lacking observation to complete a strong statistical analysis. Thus, FEM is not recommended to use if there is a large sample size model (Gujarati and Porter, 2009).

In order to test whether POLS or FEM is fit for our panel data, Likelihood test will be conducted to examine their suitability. The null hypothesis and alternative hypothesis are as below:

$H_0$: $\mu_i = 0$, $i = 1, 2, \ldots, N$ (POLS is preferable)
$H_1$: $\mu_i \neq 0$, $i = 1, 2, \ldots, N$ (FEM is preferable)

If given that null hypothesis is rejected, it means that FEM is proved to have better suitability over POLS model in the study.

#### 3.5.3.3 Random Effects Model (REM)

Random Effects Model (REM) is an analysis of panel data assuming that the individual-specific effect is uncorrelated with the regressors across all time periods of the same individual. Besides, it assumes that conditional variances are constant and the conditional covariance are zero. The regressors are not perfectly collinear, that all regressors (but the constant) have non-zero variance and not too many extreme values.

The advantage of REM is that the random effects (RE) estimator is consistent and asymptotically normally distributed as *N* gets large for fixed *T*. It allows the derivation of efficient estimators for both within and between (group) variations. In large samples, the RE will have lower standard errors of coefficients and greater statistical power to distinguish the impacts relative to Fixed Effects. Especially for coefficients on time-variant dependent variables,

the RE estimator is more efficient (Wooldridge, 2013). Thus, we applied Hausman test to distinguish between the REM and FEM and choose the suitable model for the study. In order to perform Hausman test, the null hypothesis and alternative hypothesis are generated as shown below:

$H_0$: $\hat{\beta}_{RE}$ and $\hat{\beta}_{FE}$ are consistent but only $\hat{\beta}_{RE}$ is asymptotically efficient
$H_1$: $\hat{\beta}_{FE}$ is consistent

In the case of not rejecting null hypothesis, REM model will be the appropriate panel data regression model.

## 3.6 Conclusion

This chapter has identified the panel data regression model followed by the description of data sources as well as justification of research design. All the data of variables was obtained from Bloomberg and the measurement of all variables has been clearly explained in data collection method. Besides, the rationale of choosing the variables is clarified in this chapter and followed by the econometric method. The next following chapter will be further explored about the empirical result and output of each methodology. The Eviews 9.5 software will be used to conduct the data analysis.

# CHAPTER 4: DATA ANALYSIS

## 4.0 Introduction

This chapter will analyze, interpret and explain empirical results generated by EVIEW software accordingly. We conducted POLS to check on the model's goodness of fit by adding additional independent variables. FEM and REM have been regressed to compare with POLS in order to select the best efficient model. Likelihood test was employed to compare between POLS and FEM, while LM Test was applied to compare POLS and REM. Final model was determined through Hausman Test to find out the best model between FEM and REM.

## 4.1 Panel Unit Root Test

As degree of stationary of data is very important, panel unit root test was taken into account to obtain significant model and stationary relationship between the variables. Non-stationary data can cause spurious regressions. Table 4.1 reported the result of few unit root tests at level. Assuming that common unit root process is present in our panel data, we check into LLC test. This test is not only having the smallest size distortion, but it also performs best against homogeneous alternative and the autoregressive coefficient is same for all panel unit (Breitung & Pesaran, 2005). Besides that, we also look into individual unit root test process to check about the consistency of the result. In this case, we choose to perform ADF Fisher test as from the study of Maddala and Wu (1999), they alleged that ADF Fisher test is simple and straight forward to use.

Table 4.1: Results of Panel Unit-Root Test

| **Variable** | **LLC** | | **ADF-FISHER CHI SQUARE** | |
|---|---|---|---|---|
| | $H_0$**: Unit Root** | | $H_0$**: Unit Root** | |
| **Level** | Constant | Constant and Trend | Constant | Constant and Trend |
| **ROA** | -16.8964*** | -13.3626*** | 227.67*** | 193.887*** |
| **Debt** | -56.9900*** | -36.5283*** | 232.696*** | 199.931*** |
| **DSO** | -17.1779*** | -16.4258*** | 225.715*** | 205.219*** |
| **DIO** | -9.90644*** | -14.4968*** | 211.786*** | 187.846*** |
| **DPO** | -5.26082*** | -10.823*** | 176.701*** | 160.891*** |

Note: *, **, *** significant of level of 10%, 5%, 1%

**Hypothesis:**

$H_0$: ROA/ Debt/ DSO/ DIO/ DPO are not stationary and have a unit root.

$H_1$: ROA/ Debt/ DSO/ DIO/ DPO are stationary and do not have a unit root.

In both LLC and ADF-Fisher test, t-statistics of all variables at level and constants effect are stationary and do not have a unit root at 1% significant level. The same results are obtained at level with constant and trend. All of the results are said to be statistically significant. Rejection of unit root by more than one test at level indicated that all the variables are stationary. We can conclude that this panel regression is free from spurious regression problem as all the variables are stationary according to both tests.

## 4.2 Baseline Estimation

In this section, we adopted multiple stages of regression by adding additional independent variables into the model. Hence, equation (1), equation (2) and equation (3) are formed to find out the best fit equation in explaining the relationship between dependent and independent variables.

$$ROA_{it} = \hat{\beta}_0 + \hat{\beta}_1 DEBT_{1it} + \hat{\beta}_2 DSO_{2it} + \mu_{it} \quad (1)$$

$$ROA_{it} = \hat{\beta}_0 + \hat{\beta}_1 DEBT_{1it} + \hat{\beta}_2 DSO_{2it} + \hat{\beta}_3 DIO_{3it} + \mu_{it} \quad (2)$$

$$ROA_{it} = \hat{\beta}_0 + \hat{\beta}_1 DEBT_{1it} + \hat{\beta}_2 DSO_{2it} + \hat{\beta}_3 DIO_{3it} + \hat{\beta}_4 DPO_{4it} + \mu_{it} \quad (3)$$

Table 4.2 indicates ROA as left-hand side variable of the equation and it summarized all the regression that had been regressed. We start with equation (1) where only DEBT and DSO act as independent variables. Adjusted $R^2$ of this equation is 0.302562. Clearly, both DEBT and DSO are significant at 1% significant level. They have a negative relationship toward dependent variable.

In the next stage, an additional independent variable which is DIO are introduced into the model and forming equation (2). The adjusted $R^2$ had increased from 0.302562 to 0.304979. All the right-hand side variables in this model showed a significant negative relationship towards ROA at 1% significant level.

By moving forward to equation (3), DPO are added into the model to increase goodness of fit. The adjusted $R^2$ had increased around 0.00787 which is from 0.304979 to 0.312849. This means that there are 31.28% of the variation in predicted ROA is explained by the variation in DEBT, DSO, DIO, DPO, after taking into account the degree of freedom. DEBT and DSO remain negatively significant at 1% significant level. However, the significant level of DIO had decreased from 1% to 5%. Besides, DPO showed an insignificant result.

After the stage of testing with different variables, equation (3) seem to be the best model in order to examine the effect of working capital management and capital structure on firm profitability. We believed that this model with the highest adjusted $R^2$ provided us with the best model among the three. Most of the variables are significant at 1% significant level although DIO is statistically significant at 5% significant level and DPO are found to be insignificant.

Table 4.2 Regression using Pooled Ordinary Least Square (POLS)

| Model | (1) | (2) | (3) |
|---|---|---|---|
| C | 14.09395*** | 15.12305*** | 15.11606*** |
| | (13.92289) | (14.02282) | (13.94685) |
| DEBT | -0.146406*** | -0.143295*** | -0.143098*** |
| | (-5.801928) | (-5.700392) | (-5.653642) |
| DSO | -0.087768*** | -0.086724*** | -0.086745*** |
| | (-7.875387) | (-7.815013) | (-7.807827) |
| DIO | | -0.010263*** | -0.010401** |
| | | (-2.671978) | (-2.414264) |
| DPO | | | 0.000416 |
| | | | (0.070858) |
| $R^2$ | 0.304791 | 0.308312 | 0.317242 |
| Adjusted $R^2$ | 0.302562 | 0.304979 | 0.312849 |
| F-statistic | 44.94440*** | 32.63756*** | 24.44033*** |
| D-W test stat | 0.556603 | 0.572056 | 0.571636 |

Note: The asterisks *, **, *** indicate rejection of the null hypothesis at 10%, 5% and 1% level of significance respectively. T-statistic in parentheses.

## 4.3 Model Comparison

In order to test our panel data with different assumption from different models, we have regressed several models as mentioned earlier which are POLS, FEM and REM. The purpose of model comparison is to find out which model is more significant and suitable to be applied. Comparison between these three models are shown in Table 4.3. The second column in Table 4.3 is estimation result from POLS, while the third and fourth column is the estimation result from FEM and REM respectively.

### 4.3.1 POLS

From the POLS model, it indicated that the model is statistically significant with the 0.312849 goodness of fits. There are three variables statistic negatively significant towards dependent variable which include DEBT, DSO, and DIO. DEBT and DSO are statistically significant at 1% significant level while DIO is statistically significant at 5% significant level. However, DPO is not significant toward profitability (ROA).

### 4.3.2 FEM

In FEM model, the goodness of fit is higher in which the adjusted $R^2$ increased from 0.312849 to 0.719860 as compared to POLS model. The result shown in FEM is almost the same with POLS result, where most of the independent variables are significant toward the left-hand side variables. Variables which include DEBT, DSO, and DIO showed a statistically significant result. The DEBT and DSO remained significant at 1% significant level. Besides that, DPO remained insignificant in this model. However, significant level of DIO had

increased from 5% to 1% significant level. DIO which initially have negative relationship with dependent variable in POLS model have changed to have a positive relationship in FEM. On the other hand, DPO which having a positive relationship in POLS model have changed to negative relationship towards ROA in FEM model.

### 4.3.3 REM

By using REM, it showed a higher adjusted $R^2$ compared to POLS model. The adjusted $R^2$ has increased around 0.073762 from 0.312849 to 0.386611. The number of significant variables decreased from three variables to two variables. The DEBT and DSO are statistically negatively significant towards the dependent variables. By this model, DEBT and DSO are statistically significant at 1% significant level. This showed that these two variables must include in the model. However, DIO and DPO are not significant towards the profitability (ROA) although it showed the positive and negative sign respectively.

Table 4.3: Model Comparison between POLS, FEM and REM

| MODEL | POLS | FEM | REM |
|---|---|---|---|
| C | 15.11606*** | 12.05409*** | 12.36964*** |
| | (13.94685) | (9.965434) | (7.888022) |
| DEBT | -0.143098*** | -0.228098*** | -0.20092*** |
| | (-5.653642) | (-5.716868) | (-5.729682) |
| DSO | -0.086745*** | -0.038538*** | -0.045572*** |
| | (-7.807827) | (-3.084809) | (-3.864907) |
| DIO | -0.010401** | 0.006896*** | 0.001861 |
| | (-2.414624) | (2.592358) | (0.298329) |
| DPO | 0.000416 | -0.006037 | -0.002754 |
| | (0.070858) | (-0.982581) | (-0.494827) |
| $R^2$ | 0.317242 | 0.721649 | 0.390534 |
| ADJUSTED $R^2$ | 0.312849 | 0.719860 | 0.386611 |
| Prob (F-Statistic) | 0.0000*** | 0.0000*** | 0.0000*** |
| D- W TEST STAT | 0.571636 | 1.569572 | 1.426826 |

Note: The asterisks *, **, *** indicate rejection of the null hypothesis at 10%, 5% and 1% level of significance respectively. T-statistic in parentheses.

### 4.3.4 Comparison Test

In order to choose the best test to explain the relationship between the working capital and capital structure towards manufacturing firms' profitability, several additional tests such as Likelihood test, LM test and Hausman test have been implemented. All the necessary information is provided in Table 4.4.

First and foremost, we performed the Likelihood test to compare the preference between the POLS and FEM. If the p-value is smaller than 0.1, 0.05 and 0.01 respectively, the null hypothesis will be rejected and indicate FEM is preferable. Through table 4.4, the result indicated test statistic of 18.5844 with p-value of 0.0000, which is smaller than the significant level of 10%, 5%, and 1%. Since the null hypothesis has been rejected, we have sufficient evidence to conclude that the FEM is more suitable and better than POLS. Therefore, in Likelihood test, FEM is more preferable.

Next, we proceed with the test known as LM test to make comparison between POLS and REM to decide which one is preferable to apply. The result comes out with the test statistic of 1102.501 with the p-value of 0.000, which is smaller than the significant level of 10%, 5%, and 1%. Thus, the null hypothesis of LM test is rejected and we have sufficient evidence to conclude that the REM model is better than POLS.

Since the Likelihood test and LM test had been proven that FEM and REM are more appropriate to our panel data as compared to POLS, Hausman test is then constructed. The purpose of Hausman test is to make comparison between the FEM and REM which is the best model to be selected. With the test statistic of 185.9829, we reject the null hypothesis as the p-value 0.0092 is less than the significant level at 10%, 5% and 1% respectively. Throughout this test, REM is proven to be inconsistent and inefficient. Therefore, we can make a

conclusion that FEM model is the best model to our panel data. Hence, FEM will be used to interpret the coefficients of estimations.

Table 4.4 Model Comparison Test

| | **Likelihood Test** | **LM Test** | **Hausman Test** |
|---|---|---|---|
| **Test Statistic** | 18.584357*** | 1102.501*** | 185.982923*** |
| **Decision Making** | Reject null hypothesis | Reject null hypothesis | Reject null hypothesis |
| **Conclusion** | FEM is preferable compared to POLS | REM is preferable compared to POLS | FEM is preferable compared to REM |

Notes: *, ** and *** implies that the rejection of the null hypothesis at 10%, 5% and 1% significant level respectively.

## 4.4 Fixed Effect Model (FEM)

After ran through all the tests, we identified that FEM is the best model when comparing with other models. Again, we adopted multiple-stage regression by adding an additional independent variable into the model to find out the best model to explain the relationship between dependent variable and independent variables. Table 4.5 showed ROA as dependent variables and it summarize all the regression that had been regressed. All the necessary data such as goodness of fit and significance of variables are presented in this table.

In equation (4), DEBT and DSO are included as right-hand side variables. The adjusted $R^2$ is 0.689117. Both DEBT and DSO are negatively significant at 1% significant level. For equation (5), the model is tested by adding an additional independent variable which is DIO. The adjusted $R^2$ had increased slightly from 0.689117 to 0.708071.

DEBT and DSO showed negatively significant result at 1% significant level. However, DIO showed insignificant positive relationship toward the dependent variable.

On top of that, equation (6) derived by adding another independent variable into the model which is DPO. The adjusted $R^2$ had increased slightly from 0.708071 to 0.719860, which is around 0.011789. This means that there are 71.99% of the variation in predicted ROA is explained by the variation in DEBT, DSO, DIO and DPO, after taking into account the degree of freedom. Most of the variables are significant at 1% significant level except DPO showed an insignificant result. DEBT, DSO and DPO indicated a negative relationship with ROA while DIO posed a positive relationship.

After several stages of testing with different variables, equation (6) seems to be the best model among the three equations. The adjusted $R^2$ of this model is the highest and most of the variables are significant. This result is consistent with the result that we had been tested by using POLS test in the previous section. This further convinced us that equation (6) is the best model to investigate the effect of working capital management and capital structure on firm's profitability.

Table 4.5: Regression using Fixed Effect Model (FEM)

| Model | (4) | (5) | (6) |
|---|---|---|---|
| C | 12.26876*** | 12.18473*** | 12.05409*** |
| | (10.58510) | (10.13516) | (9.965434) |
| DEBT | -0.218099*** | -0.219146*** | -0.228098*** |
| | (-5.648416) | (-5.641717) | (-5.716868) |
| DSO | -0.037455*** | -0.037754*** | -0.038538*** |
| | (-3.019110) | (-3.028344) | (-3.084809) |
| DIO | | 0.001106 | 0.006896*** |
| | | (0.266088) | (2.592358) |
| DPO | | | -0.006037 |
| | | | (-0.982581) |
| $R^2$ | 0.690113 | 0.709466 | 0.721649 |
| Adjusted R2 | 0.689117 | 0.708071 | 0.719860 |
| F-statistic | 22.31753*** | 21.90458*** | 21.55428*** |
| D-W Test Stat | 1.573832 | 1.573481 | 1.569572 |

Note: The asterisks *, **, *** indicate rejection of the null hypothesis at 10%, 5% and 1% level of significance respectively. T-statistic in parentheses.

## 4.5 Panel Data Analysis and Discussion

After conducted necessary tests in previous section, we concluded that our model should be presented by using FEM as shown below:

$$ROA_{it} = \beta_0 + \beta_1 DEBT_{1it} + \beta_2 DSO_{2it} + \beta_3 DIO_{3it} + \beta_4 DPO_{4it} + \mu_{it} \quad (3)$$

$$ROA_{it} = 12.05409 - 0.228098 DEBT_{1it} - 0.038538 DSO_{2it} + 0.006896 DIO_{3it} - 0.006037 DPO_{4it} + \mu_{it}$$

Where i = 1, 2, …, 57

t = 2006, 2007, …, 2016

Model (6) in Table 4.5 above summarize the estimation result from the model we had chosen. The $R^2$ of the model is 0.721649 and the adjusted $R^2$ is 0.719860. Most of the explanatory variables are highly significant and fit with expected sign. This indicates that this model is suitable to explain how capital structure and working capital management will influence firm profitability when there is fixed effect across the firms.

Table 4.6: Summary of Findings

| Variables | Significant | Expected sign | Estimated sign | Decision |
|---|---|---|---|---|
| **DEBT** | *** | - | - | Consistent |
| **DSO** | *** | - | - | Consistent |
| **DIO** | *** | + | + | Consistent |
| **DPO** | | - | - | Consistent |

The estimated result from the regression analysis indicates the DEBT is negatively significant at 1% of significant level with the P value of 0.0000 and coefficient of (-0.228098). We obtained the same result in which the sign of the estimated result is fit with the expected sign which is negative sign. Thus, this indicated that when the debt ratio increases by 1 percentage point, on average, the firm's profitability will be decreased by 0.2281 percentage point with holding other variables constant.

The estimated result of DEBT from our model is consistent and similar with the results of Salim and Yadav (2012), Zeitun and Tian (2007), Mohamad and Saad (2010), Jayarathne (2014), Garg and Gumbochuma (2015), Jakpar et.al (2017), Gill et al, (2011), Gill et al, (2009), Shubita and Alsawalhah (2012), Tufail et al. (2013), Rajan and Zingales (1995), and Ferati and Ejupi (n.d). All of these illustrated that when the debt or leverage increase, profitability of the firm will be decrease. Salim and Yadav (2012) mentioned that the reason of having a negative association is due to the company is confronting with the default risk of having a higher loan. Moreover, the negative result is reasonable as high leverage or debt of firm indicate that the firm's profitability is low. In other words, the higher of firm' profitability, the lesser the firm use of debt.

Besides that, the estimated results of Fixed Effect Model presented in Table 4.8 shows that the DSO is significant (p-value = 0.0021) and negatively (-0.038538) related to firm's profitability at 1% significant level. The estimated sign for DSO is fit with the expected sign where both results indicate a negative relationship between DSO and firm's profitability. This implies that by holding other variables constant, if DSO increase by 1 day, on average, the firm's profitability will decline by 0.03854 percentage point.

The results is consistent with Wasuizzaman (2015), Ng et al. (2017), Bulin et al. (2016), Mawutor (2014), Alipour (2011), Deloof (2003), Javid (2014), Gill et al. (2010), Padachi (2006), Saghir et al. (2011), Aggarwal and Chaudhary (2015), Napompech (2012), Khan et al. (2011), Samiloglu and Akgun (2016), Lyngstadaas and Berg (2016),

Pais and Gama (2015), Makori and Jagongo (2013), Kumaraswamy (2016), Kasozi (2017), Dong and Su (2010), Ponsian et al. (2014) and Akoto et al. (2013) who reporting a negative relationship between DSO and profitability.

It makes economic sense that, the longer the period it takes to collect receivable from customers, the more working capital is tied up, and the firm has less opportunity to use this capital for other purpose like viable investment or project (Wasuizzaman, 2015). Therefore, the firm's profitability can be enhanced by giving their customers a shorter credit period or speeding up receivable reception (Napompech, 2012; Alipour, 2011; Gill et al., 2010; Makori & Jagongo, 2013; Dong & Su, 2010; Mawutor, 2014).

On top of that, another independent variable which is DIO is shown to be negatively significant at 1% significant level with its p-value (0.0033). However, the estimated sign for DIO does not fit with expected sign although it is significantly affect firm profitability at 1% significant level. The result indicates a positive relationship for DIO instead of negative relationship in our prior expectation. A positive sign indicates that firm profitability will increase when there is an incremental in DIO. By holding other variables constant, on average, for every 1 day increase in DIO, the ROA will increase by 0.006896 percentage point.

The differences between the expected sign and estimate sign might because of changes in country. The result from this study may not be universal with other countries due to the size and nature of country, government policy and other similar factors (Kumaraswamy, 2016). Research from Jakpar et al. (2017) which mainly focus on manufacturing sector in Malaysia obtained the same result with our study. In addition, other study which based on manufacturing firms such as Kasozi (2017), Padachi (2006), Arunkumar and Radharamanan (2012) and Mawutor (2014) also indicate that DIO should be positively significant to profitability.

On top of that, since this is general model, it might only appropriate with same findings in selected specific business sectors only (Arunkumar & Radharamanan, 2012). Their result is supported by Fraser and Ormiston (2013) in which they also declared that DIO will be different for different type of industry. It is possible to give a different result due to different business sector. For instance, research from Khan, Akash, Hamid and Hussain (2011) and Asaduzzaman and Chowdhury (2014) which both of them study on textile sector have same result with our study in which they also indicate that there should be a positive relationship between DIO and profitability. However, study done by Mehta (2014) on real estate and construction sector show a negative relationship between DIO and profitability.

This study results proposed that profitability of firms can be increased by longer DIO. This finding is constant with the research done by Abuzayed (2012). His result concluded that incremental in inventory is related to product demand in which further linked to increase in sales and profitability of firms. On the other hand, profitability dropped is because of consumers take longer time in assessing product quality (Deloof, 2003).

According to the estimated coefficient of -0.006037, it implies that by holding other variables constant, on average, for every 1 day increase in DPO, the ROA will decrease by 0.006037 percentage point. We observed that the estimated negative sign for the coefficient of DPO is consistent with our expected sign. According to Mawutor (2014), lower profitability is connected with the increase of DPO, as it makes economic sense that less profitability firms wait longer time to pay their bills since delaying payment can become a flexible source of financing for them. On the other hand, if the firms pay their bills earlier (DPO decreases), the cost of goods will be lower caused by the advantage of trade credit granted such as early payment discounts, leading to gross profit increases (Lyngstadaas & Berg, 2016).

However, out of our expectation, DPO showed to be insignificant in affecting the profitability of manufacturing firms in Malaysia at all level of significance. This might be caused by the industry specific factors as the study is generalized to manufacturing industries only. It is supported by Gill et al. (2010), Akoto et al. (2013) and Ng et al. (2017) that studied on manufacturing firms in United States, Ghana and Malaysia respectively also found insignificant relationship between DPO and profitability. Whereas the literature research on firms of all industries usually show significant relation. Although it is statistically insignificant, the results confirm the theoretical relationship between DPO and profitability. Prolonged trade credit helps in explaining the key financial factors of listed manufacturing firms, but it is not a main factor to take account in improving profitability, as stated by Akoto et al. (2013).

## 4.6 Conclusion

This chapter began with Panel Unit Root Test to test for the degree of stationary of the data and we found that this panel regression is free from spurious regression problem. After running through all the necessary test, FEM found to be the most suitable model among POLS, REM and FEM in order to study the effect of working capital management and capital structure on firm profitability. Based on the finding, three out of four variables are significant at 1% significant level, which include DEBT, DSO and DIO. All the empirical result had been shown in table form. This chapter is ended with discussion of the result and the discussion will further concluded in chapter 5.

# CHAPTER 5: CONCLUSION

## 5.0 Introduction

This paper studies about the effect of working capital and capital structure on listed manufacturing firm's profitability in Malaysia using annual data for 11 years. Various tests have been conducted to determine relationship between the variables. In this chapter, we will discuss briefly on the major findings from previous chapters. Next, we will continue with the implication of the findings of study which might be useful for management of corporations. On top of that, limitations of the research and recommendations for future research will be discussed. Lastly, this chapter will be ended by a brief conclusion.

## 5.1 Summary of Findings

The study used a sample of 57 manufacturing firms listed in Bursa Malaysia for the period of 2006 to 2016. Sample is randomly selected and filtered by elimination of firms with missing and invalid data. Thus, there is a total of 627 observations forming a balanced panel data. Before examining the regression model by using panel data analysis, we carried out panel unit root test in order to check stationary of the variables. We found that all of the variables are stationary and do not have a unit root problem in both LLC test and ADF Fisher test. This result allows us to proceed to the next stage.

Next, we adopted multiple stage regression by adding an additional variable successively into the model to find out the best regression model. As a result, the best regression model formed by DEBT, DSO, DIO and DSO as independent variables with ROA as dependent variable was selected. It has the highest adjusted R-squared which

indicates greatest goodness of fit adjusted by number of predictors. Then, we applied Likelihood test, LM test and Hausman test to find out the best fitted panel data model among POLS, FEM and REM. The result showed that FEM is the best model in explaining the effect of working capital management and capital structure toward the selected firm's profitability.

By testing the best model FEM, we found that three out of the four variables are statistically significant with the left-hand side variable, which are DEBT, DSO, and DIO. They are proved to be significant at all level of significance which is consistent to our expected result. However, another independent variable, DPO is unexpectedly found to be statistically insignificant. Besides, all of the independent variables' estimated sign are consistent with our expected sign.

According to our results, DEBT has a negative relationship with firm profitability as measured by ROA. As the leverage or debt of firm is high, this indicates that the firm's profitability is low. Besides, DSO is also negatively related to firm's profitability. By shortening credit period granted to customers, firms could generate value and increase profitability. At the same time, longer customers' credit period will restrict firms' performance as they have less working capital to be used in generating profits. On the other hand, DIO has found to have a positive relationship with firm profitability. The reason behind their positive relationship might be due to practice of bulk purchasing by the company in order to utilize advantages of lower pricing.

Besides, DPO is found to be negatively related to profitability. Less profitability firms usually wait longer to pay their bills. However, DPO is statistically insignificant in affecting firms' profitability. The inconsistency might be caused by the nature of industry sector and differences in country macroeconomics conditions. It is supported by previous studies which focus on manufacturing sector also showed the same result. We observed that our findings studied on Malaysia may not be similar with other countries due to the diverse government policy, culture and economics environment of

countries. The result suggests that this is a general model that may not be applicable to all situations with different economic industry and country.

## 5.2 Managerial Implications

First of all, the management should employ internal financing option as increasing in leveraging will reduce profitability of the firms. The management can make decision to use the retained profits, the sale of assets and the controlling of working capital for their operational activities and business expansion. The internal source of financing is easily accessible, and the dilution of ownership could be prevented. Besides, it is an indication of outstanding performance when the business is independently meeting its demands with its own efficiency and operational surplus.

Besides, the results suggest that managers can create value for their shareholders by reducing the number of day accounts receivable reasonably to the minimum. The management should improve firm's profitability by reducing the credit period granted to their customer. To encourage early payment from debtor, the management should construct discount structure selectively for those best clients who are most likely to honor the agreement to pay early and have been with the firm for a while. This method increases the possibility of early payments resulting in lower days sales outstanding, better cash flow projection and lastly with better profitability.

Moreover, the finding showed that the management should maintain sufficiently high inventory levels for high DSO. Companies should try to strike a balance by means of just keeping sufficient inventory to meet current and short-term demand, but not so much that they have excess. One approach in keeping inventory levels and lower costs is to negotiate faster supplier lead-times. According to Godinho and Veloso (2012), the management should adopt the method of reducing supplier lead-times to improve the

logistics management. Faster lead-times enable the management to have more flexibility when reordering inventory and enables storing of less inventory in warehouse. Therefore, short term carrying charges can be reduced and the long-term risk of holding stocks can be eliminated ultimately.

The management should take advantage by withhold their payment to suppliers to an optimal duration for more usable funds to meet the working capital needs. Businesses must take a deliberate approach to accounts payable management. The accounts payable departments, along with the purchasing and procurement departments should work jointly with top management to administer a working capital culture throughout the company. By taking up this approach, the management is able to ensure that the invoices are received and processed in a timely manner while focus on the importance of optimizing payable and making the working capital available to stimulate growth at the same time.

## 5.3 Limitations and recommendations

Our study was limited to data constraints with a sample of only 57 listed manufacturing firms in Bursa Malaysia. In the process of data collection, we faced the problem of missing and invalid values in firms' data from Bloomberg which lead to elimination of some firms and reduction of sample size. Consider that there is a much larger number of manufacturing firms in Malaysia, the findings of study may be less accurate in making generalization of entire manufacturing sector as a result of small sample size. Thus, future researchers could include larger sample of the firms and longer time period in order to re-evaluate a better result that is more generalized. Generalization of the findings could be improved by taking account the representational of sample, the effects of time and sample size.

Moreover, the sampling was randomly selected irrespective of business differences. Thus, the findings can only be generalized to the firms similar to the sample. It may not be applicable to other industry sectors or other countries because of the differences in nature of business, culture, trade credit policies, business growth rate, and various factors. It is supported, as we observed that literature research on foreign countries manufacturing sector provides different findings with our study on Malaysia. Future research could examine the impact of working capital and capital structure on firm profitability for economic industries and countries other than Malaysia manufacturing sector. Subsequently, compare the findings in order to test whether our study gives general opinion.

Furthermore, only few proxies that we consider most crucial in representing the variables are included in the model analysis in order to avoid the problem of multicollinearity. However, exclusion of other proxies may give less comprehensive results and limit the comparison between different models. Therefore, while taking account of the seriousness of multicollinearity problem, future research can extend to more working capital variables including cash, marketable securities as well as other proxies of capital structure such as, short-term debt to total assets, long-term debt to total assets, and debt to equity ratio. Profitability measures including Return on Equity (ROE), operating margin, earning per shares and Tobin Q ratio can be used to establish a more diverse framework and to present a more visible picture.

Lastly, future research should include other external factors such as nominal GDP growth rate and inflation rate as well as internal factors such as firm size and firm age. On top of that, since manufacturing firms can be classified into industrial and consumer goods manufacturing, future research could study on these two categories and make comparison between them. Although the limitations are recognized, they do not discredit the significance of findings but provide ideas for future study.

## 5.4 Conclusion

In conclusion, all objectives of the research have been achieved and fulfilled. We identified the negative relationship between DEBT, DSO and DPO with ROA as measure of firm profitability as well as positive relationship of DIO with profitability. All variables except DPO is statistically significant. Thus, less priority could be put on DPO in improving profitability. In addition, we have come out with few policy implications regarding working capital and capital structure management for corporate managers. We believe that it could help in enhancing profitability and reducing rate of bankruptcy of Malaysian manufacturing firms. Lastly, limitations of the study were identified along with few recommendations for a better research in future.

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