

THE DETERMINANTS OF CAPITAL STRUCTURE:
EVIDENCE FROM MANUFACTURING FIRMS IN
MALAYSIA

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A final year project submitted in partial fulfilment of
the requirement for the degree of

BACHELOR OF BUSINESS ADMINISTRATION
(HONS) BANKING AND FINANCE

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF FINANCE

APRIL 2019

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- (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.
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ACKNOWLEDGEMENT

This research project has been successfully completed with the assistance of various authorities. Foremost, we would like to express our sincere gratitude to our supervisor Ms. Chin Lai Kwan for her motivating encouragements, enthusiasm, continuous support and guidance in the completion of this research. We really appreciate her faith in us and dedication in guiding us from start to finish, providing us with valuable ideas and concepts throughout the research. This research would not have been possible without the kind supervision and support of Ms. Chin.

Besides, we would also like to thank Universiti Tunku Abdul Rahman Kampar Campus (UTAR) for giving us the opportunity to conduct this research project as a partial fulfilment for the requirement of degree completion of Bachelor of Business Administration (HONS) Banking and Finance. This research would not have been possible without the facilities and infrastructure, especially the well-equipped library and the research database provided by our university.

Lastly, the research group would like to thank our course mates, friends and parents whom supported us through this journey. Credits are also given to each of the group members for putting in countless hours of continuous effort throughout this research. Their cooperation, brilliant ideas and dedication are key to accomplish this research within the time constrain. In short, we are grateful and appreciative for all party that had directly and indirectly helped us through this research.

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LIST OF ABBREVIATION

BPLM	Breusch Pagan Lagrange Multiple
DA	Debt to Asset
FEM	Fixed Effect Model
GDP	Gross Domestic Product
GWTH	Growth
JB	Jarque-Bera
LEV	Leverage
NDTS	Non-Debt Tax Shield
OLS	Ordinary Least Square
POLS	Pool Ordinary Least Square
REM	Random Effects Model
ROA	Return On Asset
ROE	Return On Equity
SIZE	Firm Size
VIF	Variance Inflation Factor

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PREFACE

Each of the firms needs to make an appropriate capital structure decision as this will assist a firm to achieve its sustainability and grow further as well as maximize the shareholders' wealth. In addition, the capital structure refers to the mix of financing that forms the capital of the firm, which are debt financing and equity financing. Both of the financing methods will bring either positive or negative impact towards the financed firm, hence it is important for a firm to keep in view its capital structure decision by taking into account the firm-specific factors. To gain a further understanding on this area, this study attempts in studying the relationship between the firm specific factors and firm's leverage for the manufacturing sector in Malaysia.

By referring to the GDP performance of manufacturing sector in Malaysia, it was considered as one of the vital sectors in boosting the country's economy in the future. Therefore, we are interested in conducting the further research on this sector to gain an in-depth understanding how the manufacturing listed firms maintain their business and expand further. In other words, this study will figure out which firm specific factors will affect the listed manufacturing firms' leverage.

The findings from our study may also contribute the benefits to different parties in different forms. First of all, the internal users of the manufacturing listed firms will definitely be benefited as knowing which firm specific factors they need to put much attention on to ensure the proper leverage decision will be made. Other than that, the policy makers also can introduce the effective leverage related policies to further enhancing the manufacturing listed firms' business operation by referring to the findings. The investors also can take advantage from our study result this is due to they can take the impacts of the firm specific factors on firm's leverage into account while they are making investment decision.

ABSTRACT

The current study is conducted to figure out the significance of the firm specific factors on firm's leverage for the manufacturing sector in Malaysia. We had conducted the study on the 85 out of 129 manufacturing firms listed on Bursa Malaysia over the period from 2003 to 2017. Hence, the total observations for this study is 1275. There are four firm specific factors we had taken into account as our independent variables which include profitability, firm size, non-debt tax shield and growth, while the dependent variable is leverage. The determinant of profitability in this study is explained by using return on asset (ROA) ratio, while firm size is measured by using log of total revenue. Other than that, log of total depreciation expenses to total assets ratio will be applied in this study to represent non-debt tax shield, and another determinant of growth is denoted by percentage change in total revenue. On the other hand, debt to asset ratio is applied in this study as the indicator for leverage.

We had tested the significance of independent variables on dependent variable by using the software called E-views 10, and found that the independent variables of non-debt tax shield, profitability and firm size significantly affect firm's leverage in Malaysian manufacturing sector, while the independent variable of growth not having significant impact on firm's leverage in the particular sector.

The positive and significant result of profitability is consistent with trade off theory, and supported by the prior researches which done by Rajan and Zingales (1995), Yusuf, Yunus and Supaat (2013) and Shah and Khan (2007). Besides, the actual negative sign and significance of firm size can be explained by pecking order theory, and in accordance with the findings found by Alves Pereira and Ferreira (2011), Rajan and Zingales (1995), Hussain and Miras (2015) and Guner (2016). Other than that, the positive and significant relationship between non-debt tax shield and leverage in this study also in line with the prior researches done by Bradley, Jarrell and Kim (1984) and Vuran, Tas and Adiloglu (2017). Further, the results of negative sign and insignificance of growth are consistent with the study done by Chen and Zhao (2006), Mouamer (2011), Sheikh and Wang (2011) and Baker and Wurgler (2002).

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

As stated by Maina and Ishmail (2014), in order to maintain the business operation and maximize the firm performance, each of the firms has to make an appropriate capital structure decision. Hence, the proportions of debt and equity financing need to be considered by a firm all the time in order to prevent itself in depending heavily on either side. This is due to the capital structure of an organization is combined by debts and equities which also known as the leverage of a firm (Alkhatib, 2012).

As a result, a firm needs to always consider the impacts of the firm specific factors on its leverage, to ensure the appropriate financing decision do build up the confidence of investors. The reason behind this is every investor will primarily aim at making profit from investment, therefore the first thing which the investor will evaluate is firm performance, and it can be further improved by applying different levels of debt financing and equity financing (Gleason, Mathur & Mathur, 2000).

All in all, the financial management of a firm needs to always ensure the firm has taken proper action on capital structure option and also maximized the shareholders' value. In Chapter 1, we will discuss about the overview of capital structure in particularly, debt financing in Malaysia, the problem statement, the research objectives and the significance of study.

1.1 Research Background

1.1.1 Overview of Capital Structure

According to the study done by Maina and Ishmail (2014), each of the firms has to maintain its business operation through financing, and the source of financing can be done either internally or externally. As reported by Nadaraja, Zulkafli and Masron (2011), the firms usually will first get the financing internally then only adopt external financing as their last resort in the process of firm financing. This is due to external financing of a firm will always be given a non-profitable indicator by the public. Further, Khan (2012) reports there are different fund sources can be considered while making external oriented capital structure decisions, including debt financing which can based on short-term and long-term basis, and equity financing through the issuance of preferred stock and common stock.

In order to achieve the goal of maximizing shareholders wealth, each of the firms especially for those credit rated firms have to always ensure they have made appropriate capital structure decisions by combining different financing sources effectively. In other words, each of the financing decisions a firm has made is important since it will take a role in determining the appropriate combination of different financial resources in turn affect the debt financing decisions (Pouraghajan, Malekian, Emamgholipour, Lotfollahpour & Bagheri, 2012). Other than that, in the case the decisions for appropriate capital structure and investment are made, the capital cost for a firm will be reduced and at the same time, its market value will be increased, and ultimately the shareholders wealth will be enhanced (Modarres & Abdoallahzadeh, 2008).

Apart from having an assumption that the appropriate capital structure will enhance firm value, there is another contrast assumption so called perfect capital market. This assumption suggests the market will be free of tax, transaction costs and the investors possess homogeneous expectations,

hence there is no relationship between capital structure and firm value. This is due to the tax advantage on debt financing will not exist. Besides, the investors also able to engage in an exploitation of arbitrage opportunities by assuming the undervalued share price will increase and vice versa. In these cases, there is low or even no potential for a firm to increase its value through the debt and equity financing since it cannot take advantage from these two ways.

However, the assumption does not hold in the real world as every firm has to pay tax and bear the bankruptcy costs. In this case, every firm needs to make an appropriate capital structure decision to achieve a balance between debt financing and equity financing. As stated by Auerbach (1984), the cost of equity finance always goes beyond cost of debt finance. Therefore, in the event a firm has too little debt, its cost of capital will maintain a high level as the cost of equity is always higher than cost of debt. In this case, the firm will have to reject a lot of investment opportunities due to high cost of capital. Besides, most of the investors will expect a firm to take high debt and view them having high commitment in repaying debt. The reason behind this is the debt commitments will avoid the phenomenon of overspending takes place in the debt-financed firm, and it will ensure the firm utilizes those debts wisely by having profitable investments (Czarnitzki & Kraft, 2009). Therefore, in case the firm takes too little debt, it will be considered as less competitive since it is viewed as having low commitment and a low profitability will be predicted as well. According to the study done by Fama and French (2002), a firm will be benefited through debt financing in the form of enjoying leverage effect. Therefore, when there is less debt adopted in the firm, the interest payment will be less, and ultimately the tax shield benefit will be diluted as well.

On the other hand, if the firm has too much debt, then it is exposed to high default risk high bankrupt probability in case that it unable to service the debt (Fama & French, 2002). In order to analyze how a firm will be affected either positively or negatively, further research should be done on this area.

1.1.2 Overview of Debt Financing

The capital structure of a firm is mainly comprised of two ways which are debt financing and equity financing. Based on the study from Maina and Ishmail (2014), debt financing is a way in which a firm can raise its capital by taking loan on either long-term or short-term basis. For those contributors to debt capital of a firm will be treated as creditors and will receive fixed amount of return on annual basis. Other than that, the debt contributors also will have priorities in receiving the annual repayment of returns as compared to the equity contributors.

As stated by Ebrahim, Girma, Shah and William (2014), the dynamic changes in capital structure of Malaysian firms over the period from 1988 to 2009 were affected by the firm specific determinants including firm size, profitability, growth, tangibility, industry and volatility.

Based on the research done by Zulkhibri (2015), in Malaysia, the large firms have contributed to a larger portion of borrowings on both short-term and long-term borrowings by comparing with the small firms. The reason behind this is for those large firms, most of them are able to involve themselves in diversified operations in different sectors, hence their exposed risks can be minimized all the time. As a result, there is no way to prevent the large firms in accessing to external financing and higher leverage is resulted.

For those Malaysian firms which have high profitability also will have lower debt and equity financing since they able to maintain a large cash reserves and would adopt internal financing instead of external financing (Myers & Majluf, 1984).

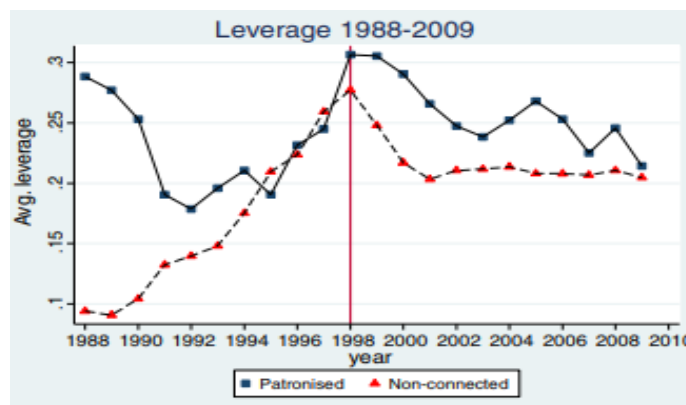
Looking from the perspectives of firm growth and volatility, Ebrahim et al. (2014) had stated for the Malaysian firms with high growth rate and lower volatility, they would expose to better investment opportunities which may have favorable return and low risk. In other words, those firms would not

encounter underinvestment problems, so do the chances to engage in financing process will be reduced as well. Moreover, for those Malaysian firms which hold a huge portion of tangible assets will more likely to have higher leverage rate but lower interest rate will be charged on them. This is because all of their debts can be backed by the tangible assets which also known as collaterals (Rajan & Zingales, 1995).

In addition, the leverage ratios of Malaysian firms also move in line in accordance with their particular industrial sectors. From this, we can know that the capital structure of Malaysian firms is always maintained at an optimum level with the industry benchmark (Ebrahim et al., 2014).

1.1.2.1 Overview of Debt Financing: Trend of Debt Financing in Malaysia

Figure 1.1: Average Leverage for Patronized Firm and Non-Connected Firm from 1988 to 2009



Source: International Review of Financial Analysis (Ebrahim, Girma, Shah & Williams, 2014)

In Figure 1.1, we can know the overall leverage rate for patronized firms was higher than the non-connected firms no matter during the pre-crisis period (1988 to 1997) or post-crisis period (2000 to 2009).

Further, during the pre-crisis period (1988 to 1997), the debt which the patronized firms had serviced was twice as compared to the non-connected firms. This is due to the government will always support these firms in the event they are encountering some financial difficulties, hence the chances for them to service the debt will be higher (Shleifer & Vishny, 1992). In contrast with the non-connected firms, they need to always ensure their leverage rate to be maintained at an appropriate level in order to confident all of their investors.

Additionally, during the crisis periods (1998 to 1999), the difference between the average leverage rate of the patronized and non-connected firms can be further explained by the statement which the politically related firms will be affected more during an exogeneous shock since the ability of the government in a country will be limited in providing them the extra subsidies (Johnson & Mitton, 2003).

Looking from the perspective of post-crisis period (2000 to 2009), the average leverage rate for the patronized firms still showed a higher trend than the non-connected firms. However, the magnitude of decreasing in an average leverage rate for the patronized firms was larger than the non-connected firms. The reason behind this is the patronized firms were believed to be benefited from the recovery plans which have introduced by the governments (Ebrahim et al., 2014).

As a conclusion, for the Malaysian firms no matter they are politically connected or not, whenever they are exposed to the systematic risks resulted from financial crisis, their capital structure will be adjusted through the external financing in order to secure their business operations. In this case, the method of financing the firm through issuance of new shares is not an option for the firms during financial crisis period, instead, the other way of external

financing which is debt financing will be viewed as a priority by the firms. However, this is only a part of knowledge related to the capital structure of Malaysian firms during the financial crisis period, to be more specifically in knowing how the firms in the specific sector, manufacturing sector manage their capital structure, we will carry on the further research on this area.

1.1.3 Overview of Equity Financing

Another way of raising a firm's capital is equity financing through the issuance of stocks. In contrast with the debt contributors, the equity suppliers will possess a small portion of ownership of a firm, and they have right in influencing the managerial decisions of the business operation with the aid of board of directors (Maina & Ishmail, 2014). Consequently, if they notice the firm has utilized the resources in an inefficient way, they will sell their shares immediately to avoid incur losses. Other than that, the equity holders also can execute their right to intervene the internal operations of a firm through the coordination with firm managers (Boateng, 2004). Consequently, the firm will suffer high operating costs in revising the internal business environment. Apart from having high organizing costs through equity financing, some other costs which related to adverse selection, taxes, floatation and premium also will be incurred by the firm (Maina & Ishmail, 2014).

However, there is another argument saying that for the firm which apply equity financing whose financial performance will be improved due to the direct control from equity holders (Maina & Ishmail, 2014). By having the pressure which come from equity holders, the firm will always think in the shoes of its equity holders as putting their interest in priority during the decision-making process.

Based on the study done by Hamid, Abdullah and Kamruzzaman (2015), once a firm goes for external financing, the public will mistakenly assume that the firm is encountering financial difficulties and there will have a bad influence on its reputation. In this case, if the firm choose to apply equity financing rather than debt financing, its stock price will be adversely affected, and the equity financed firm is considered facing signaling effect. Consequently, only in the event that the new shares are overpriced or having fair price as compared with the actual stock price, then the firm will start to issue the new shares to raise its capital. This is due to even there will be an adverse effect on the new shares price, the firm will not incur so much losses as the price is allowed to decrease in certain ranges but not directly goes down beyond the actual stock price. Hence, most of the firms will choose to apply debt financing in order to secure its reputation and share price.

1.1.3.1 Trend of Equity Financing in Malaysia

There was an outstanding development in the Malaysian equity market over the period from 1980 to 1990 as resulted by a rapid structural evolution in the systems of trading, clearing and settlement. As a result, the Malaysian firms will take equity financing into account to raise the fund since the progress of launching the new shares until trading with the investors are able to be conducted in a more efficient way by using the improved infrastructures in the equity market (Securities Commission Malaysia, 2016).

As stated in Securities Commission Malaysia (2016), the growth of equity market had been continued after 1990 and became the third largest stock exchange across Asia-Pacific. This can be further explained by the general market capitalization of the KLSE was contributed by some of the listed private firms during that period.

However, the occurrence of East Asian crisis had declined the market capitalization significantly during the end of 2000.

By roughly referring to the trend of equity financing in Malaysia during the financial crisis period in 2000, a brief conclusion can be made, which those listed Malaysian firms had probably decreased their external financing activities through the issuance of new shares and this phenomenon was in contrast with the debt financing which discussed in Section 1.1.2.1 above.

1.1.4 Overview of Manufacturing Sector in Malaysia

As stated by Malaysia Productivity Corporation (2017), the manufacturing sector in Malaysia is comprised by two main sub-sectors which are export oriented sector and domestic oriented sector. The products which categorized under the export-oriented sub-sectors including chemicals and chemical products, refined petroleum, textiles, paper and paper products, wood and wood products, electrical and electronics, rubber and plastic products and wearing apparel. On the other hand, the products which categorized under the domestic-oriented sub-sectors including basic metals, food products, pharmaceutical products, machinery equipment, transport equipment, beverages, fabricated metal products and other non-metallic mineral products.

According to Palma (2005), the de-industrialization trend was taken place in 1980, however there were some countries not being affected by this trend at the end of 1990, and Malaysia was one of them. In this case, the development of Malaysia's manufacturing sector was believed able to improve in the future since it was able to escape from the de-industrialization trend.

One of the reasons for the success in Malaysia's manufacturing sector is its imports activities. Based on the study from Devadason (2009), in 2003, out of the total Malaysian imports, there was 56% accounted for parts and components since Malaysia is known as an assemble country and will always have a demand on the parts and components in order to manufacture the final goods. Further, the trade developments mainly contributed by the electronics and electrical industries in Malaysia's manufacturing sector as 68% of the total imported parts and components was accounted for the electronic components. In other words, since the trade developments had taken place, then the manufacturers in Malaysia would expose to a more supportive business environment and their production was believed to increase as the problem of shortage of raw materials would not exist.

Other than the import related factor, export activities also act as a catalyst in developing the manufacturing sector in Malaysia as it had been upgraded and exceeded the expected level to become one of the developing countries with the most sophisticated export structure in 2003. According to World Bank, 40% of the exports from manufacturing sector was accounted for high-tech products. This fact can be further supported by the statement which there was a large portion of Malaysian imports related to electronic components. From these two facts, we can know there was a relation between import and export activities in Malaysian manufacturing sector as the development in the former will contribute a significant effect to the later. In summary, the manufacturing sector in Malaysia was said to have a more efficient export platform and supportive input structure to further export its manufactured products, so do the development took place (Chang, 2012).

However, the share of manufacturing sector as per the total percentage of GDP only reached at 29.6% in 2005 and continued to decrease to 26.6% in 2009 (Rasiah, 2011). The reason behind this is at the same time, there was a rise in manufacturing power in China and a lot of foreign direct investments had been attracted by this newly arose manufactured country. This is due to the technical knowledge, organizational skills and brand

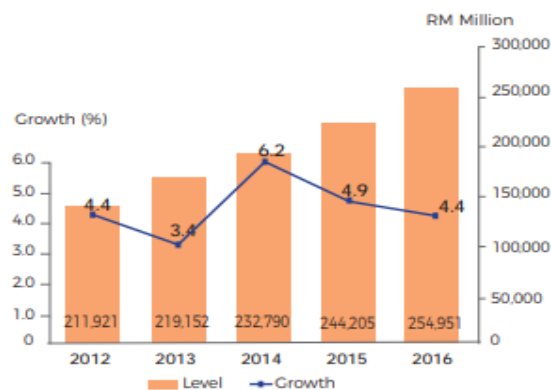
establishing skills in Malaysian and some other middle-income countries' manufacturing sector are not adequate as China, instead of they may be stuck in "middle income trap" as their competency level would be maintained at the same level but not improved to an advanced level (Chang, 2012).

Besides, there was an occurrence of deindustrialization in Malaysia in the case that the manufacturing value-added had declined, and the reason behind this phenomenon is the ups and downs in the share of manufacturing products as per GDP as resulted by the structural change process (Rasiah, 2011). To be more specifically, the manufacturing sector in Malaysia had experienced the biggest contraction as its growth showed a significant decline trend with a figure of 8.8% in the last quarter of 2008. After that, in the first quarter of 2009, the declined figure rose to 17.6% and fall to 14.5% in the following quarter of 2009 (Bekhet, Abdullah & Yasmin, 2016). With these specific data, we can conclude that the manufacturing sector in Malaysia could not escape from the consequences resulted from global financial crisis. In other words, the growth of Malaysian manufacturing sector had shown some ups and downs after the de-industrialization trend until 2008. The manufacturing sector was said to experience a recession during the following years after the global financial crisis had taken place in 2008.

According to Malaysia Productivity Corporation (2015), there was a commitment for the government to develop the manufacturing sector in Malaysia due to the strength of supplying natural resources was found in the country. Further, the global demand for manufactured goods was showing an increase trend. Consequently, the 10th Malaysia Plan was introduced in 2011 to develop the manufacturing sector as a bridge to link all industries together with its value chain, in turn a multiplier effect on the Malaysian economy will be formed. In addition, in order to defeat the emerging economies competitors (Economic Planning Unit, 2010), 11th Malaysia Plan was introduced in 2016, and the manufacturing sector still considered as a

core sector under this plan, which able to grow sustainably. By having the 11MP, the productivity of the economic activities in manufacturing sector can be improved through the enhancement in automation and workforce skills. Additionally, the electronic and electrical products, machinery and equipment and chemicals and chemical products are three primary sectors are known as the catalyst in boosting the development of the manufacturing sector. Consequently, these sectors will have priorities to first possess the welfares or incentives which introduced by government in order to further enhance their productivity. This is due to they have a significant contribution to GDP, workforce share, high multiplier effect, opportunity in improving the productivity and also their readiness for the implementation of productivity enhancement (Malaysia Productivity Corporation, 2017).

Figure 1.2: GDP Performance of the Manufacturing Sector from 2012 to 2016



Source: Department of Statistics Malaysia (Malaysia Productivity Corporation, 2017)

Based on the Figure 1.2, we can know the growth trend of manufacturing sector in the form of GDP had gone through some ups and downs over the period from 2012 to 2016. The growth of manufacturing sector had reached its peak in 2014 which amounted to 6.2% over these five years. To be more specifically, this sector had achieved its highest growth of 7.3% in the second quarter of 2014, and ultimately contributed 24.7% to the GDP. This is due to the contributions from export-oriented and import-oriented subsectors (Hooi, 2016). Even the figure had dropped 1.8% within the

following two years, but the difference in growth percentage had narrowed down from 1.3% between 2014 and 2015 to 0.5% between 2015 and 2016. Consequently, the particular sector had contributed 23% to GDP in the end of 2016. In other words, in the event of slowing down in the economy, the manufacturing sector still able to achieve an improvement (Malaysia Productivity Corporation, 2017).

To summarize, the manufacturing sector in Malaysia plays an important role in boosting the economy, in the form of exporting activities and also promoting the purchase of domestic products. As a result, it is important for the manufacturing firms in Malaysia to manage their financial leverage in an effective way, so they can always achieve an optimum business operation, in turn the manufacturing sector can be further developed and ultimately the Malaysian economy can be enhanced.

1.2 Problem Statement

According to the study conducted by Ebrahim et al. (2014), there are many researches done previously had pointed out almost all the firms will take up debt financing or leverage in order to sustain grow. In order to maximize firm's value, every firm will strive to achieve the balance between the proportion of debt and equity which were used for the firm financing. The reason for a firm to view the leverage decision as an important matter is this decision will contribute a significant effect on the firm's weighted average cost of capital, choices of financing, potential return and especially the agency relationship. On the other hand, in case that a firm fails to maintain its leverage in an appropriate situation, it may expose to bankruptcy risks due to inability to service the obligations under the debts. Hence, this study examines into four firm-specific factors including profitability, firm size, growth and non-debt tax shield to test on their effects on leverage.

First, the leverage effect from debt financing plays a role in motivating a firm to apply this financing method. Whenever a firm engages in debt financing, it needs

to service the debt by repaying the charged interest fees during a constant interval period, and this can be done by allocating a portion of its operating income for the interest payment. Further, each of the firms in Malaysia has to fulfill the tax requirements by paying the tax to government according to the operating income. However, the interest is tax deductible in this case, therefore for the firm which has applied debt financing only needs to make the tax payments by using the operating income after the charged interest fees are deducted. In other words, the tax benefit from debt financing allow the firm to retain more operating income in the form of reducing the tax payments (Nadaraja et al., 2011).

In addition, for the firm which has applied debt financing also will be signaled as high potential firm by the investors. This can be explained by the statement which the debt financing is essential for all the firms since it can assist each of them to achieve the success as well as engage in the new ventures (Bates, 1997; Cassar, 2004). In this case, the objective for a firm to raise the capital through debt financing is no longer restricted in maintaining the sustainability of its business operation, instead, the firm will also take the initiative to expand the business to new markets. As a result, the profitability of the firm will have high potential to be further maximized and in turn more and more investors will be attracted.

Apart from being benefited from the debt financing, there are some cons will be encountered by the debt-financed firm as well. One of them is the firm will be exposing to high default risk as it has to be highly committed in repaying the charged interest fees by using the future earnings. However, the future earnings of the firm are still unknown and unpredicted at the current moment, thus the firm may or may not able to settle the interest payments in the future. In case that the future earnings of the firm are insufficient to be used in settling the interest payments and the shortfall is unable to be made up by the stockholders, the firm will face the risk of being bankrupted (Hamid et al., 2015). Consequently, once the firm has depended heavily on the debt financing, the default risk it has to expose also will be increased.

Another disadvantage for a firm to apply debt financing is this method is irreversible and costly to adjust. This is because once the firm has entered into the debt contract with the creditors, it has to comply with the agreed terms and conditions. In other words, the firm cannot simply request the creditor to restructure the debt amount, percentage of charged interest and also the repayment period. Therefore, the firm needs to ensure the debt contract which it is going to enter is appropriate and suitable for itself, otherwise it may have high potential to suffer a loss. Other than that, the firm will secure its debt contract by providing the collaterals in the form of pledged assets. However, this action may reduce the profitability of the firm by restricting its flexibility in selling off those collaterals or utilizing the pledged assets to further generate the profit (Smith & Warner, 1979). Consequently, the firm is said to involve opportunity costs which is hard to adjust.

In addition, the agency problem also will be created in the case that the firm has applied debt financing since the issued debt of the firm will constraint the managerial expropriation (Jensen & Meckling, 1976). In other words, the management needs to reserve the corporate cash flow to service the debt obligations rather than utilize those reserves for further investments to maximize their own benefit, and the firm will be led to underinvestment situation. As a result, once the firm's goal is not aligned with the management's, the agency relationship will be affected significantly.

Furthermore, as long as a firm has adopted debt financing, the firm will face the constraints in raising the specific financing options. This statement can be explained more precisely using the example of leverage determinants, when the profitability of a firm shows an increasing trend, then the probability for the firm to access further debt financing will be increased as well. This is due to the firm which has ability in generating the profit will have sufficient cash reserves to service the external debt (Ponikvar, Kejžar & Mörec, 2013). However, in the event that the firm has a low profitability, then the firm will be driven to a specific financing option as it may only can access the internal financing rather than debt financing due to the constraint of having a low cash reserve. The phenomenon can be supported by the study done by Matemilola, Azman-Saini and Bany-Arifin (2013),

that stated financial constrained firms will not engage in external financing due to higher costs. Consequently, this is an important issue which the firm financial management needs to concern on how the leverage determinants will play a role in affecting the firm leverage decision, in order to assist them to build a well-managed capital structure so do the firm financing options will not be driven.

By summarizing the statements above, this research found that for the firm which have adopted debt financing will either be exposed to the pros or cons of financial leverage. Since the impacts of debt financing on a firm can be presented in both positive and negative way, therefore, the firm should always concern its financing process. Consequently, it is a great opportunity for the researchers of this study to conduct the research in Malaysia on the issue of how the firm specific determinants will affect the firm's leverage.

1.3 Research Objectives

1.3.1 General Objective

The primary purpose of the research is to examine linkage between firm specific determinants and leverage of companies for manufacturing sector in Malaysia over the period from 2003 to 2017. This paper intends to examine the leverage by considering the influences of profitability, firm size, non-debt tax shield and growth. Next, to understand more specifically about which determinants of firm will have significant impact on the firm leverage, the specific objectives are developed as follows.

1.3.2 Specific Objectives

The specific objectives of current paper are set to:

- Examine the relationship between the profitability and the firm's leverage for manufacturing sector in Malaysia over the period from 2003 to 2017.

- Examine the relationship between the firm size and the firm's leverage for manufacturing sector in Malaysia over the period from 2003 to 2017.
- Examine the relationship between the non-debt tax shield and the firm's leverage for manufacturing sector in Malaysia over the period from 2003 to 2017.
- Examine the relationship between the growth and the firm's leverage for manufacturing sector in Malaysia over the period from 2003 to 2017.

1.4 Research Questions

Four research questions have been established in this research:

- Does the firm's profitability have significant impact on the firm leverage for manufacturing sector in Malaysia over the period from 2003 to 2017?
- Does the firm's size have significant impact on the firm leverage for manufacturing sector in Malaysia over the period from 2003 to 2017?
- Does the firm's non-debt tax shield have significant impact on the firm leverage for manufacturing sector in Malaysia over the period from 2003 to 2017?
- Does the firm's growth have significant impact on the firm leverage for manufacturing sector in Malaysia over the period from 2003 to 2017?

1.5 Hypotheses of Study

The hypotheses of the relationship between independent variables and dependent variable are developed as follows:

- H₀: There is no significant relationship between firm's profitability and firm's leverage.
H₁: There is a significant relationship between firm's profitability and firm's leverage.

- H_0 : There is no significant relationship between firm's size and firm's leverage.
 H_1 : There is a significant relationship between firm's size and firm's leverage.
- H_0 : There is no significant relationship between firm's non-debt tax shield and firm's leverage.
 H_1 : There is a significant relationship between firm's non-debt tax shield and firm's leverage.
- H_0 : There is no significant relationship between firm's growth and firm's leverage.
 H_1 : There is a significant relationship between firm's growth and firm's leverage.

1.6 Significance of Study

The current research is conducted to provide an in-depth understanding about the effect of firm specific determinants on the listed firms' leverage in the background of Malaysian manufacturing sector over the period from 2003 to 2017. In order to figure out how firms make appropriate financing choices, one dependent variable (leverage) and four independent variables (profitability, growth, firm size and non-debt tax shield) have been included in this research. Ebrahim et al. (2014) had pointed out the capital structure of all the Malaysian firms had changed dynamically from 1988 to 2009, and the firm specific factors are assumed to have played a role in affecting the leverage of the firms. Consequently, this will be a great opportunity for the researchers of this study to conduct further research on this issue. Further, the findings from this research can contribute different forms of benefits to the investors, shareholders and policy makers as they can make an appropriate decision in their fields by knowing which firm specific factors will contribute significant impact on the firm's leverage.

First, to the best of this study's knowledge, the firm's leverage related researches which only focus on the manufacturing sector were limited before. Consequently, the researchers of this study have grabbed this opportunity to conduct the research which is mainly focusing on the effect of firm specific determinants on the Malaysian manufacturing firm's leverage. Other than that, most of the related studies that conducted before in Malaysia had only employed pooled OLS method in their research, however in this research, apart from applying pooled OLS method, the Fixed Effects Model (FEM) and Random Effects Model (REM) also will be applied to test the significance of the parameters in the panel data regression model that have been formed by using the variables mentioned above. Additionally, this research will also conduct the Poolability Test, Hausman Test and Breusch-Pagan Test on the methods which have applied to further understand the reliability of each of them. In other words, this research has applied different methods in conducting the data analysis, therefore the provided outcomes are assumed to be more accurate.

Furthermore, the results of which firm specific factors will affect the capital structure that will be provided in this research are extremely important to the Malaysian manufacturing firms. This can be further explained by the firms can get to know which firm specific factors they have to really be concern on, and also save the time and cost by not putting so much effort in managing the insignificant firm specific factors, since the firm's capital structure would not be affected. In this case, the Malaysian manufacturing firms able to improve their leverage.

Last but not least, Bekhet et al. (2016) states there was a decline of 20% in overall exports in those export-oriented sectors during the first quarter of 2009 in Malaysia following by the global financial crisis, and most of them are manufacturing sectors. By taking the assumption of financial crisis cycle into account, the next financial crisis will probably take place in the following years since the last crisis was happened about 10 years ago. In other words, the government policy makers can be benefited from this research's findings which concern on the relation between the firm specific determinants and firm's leverage in constructing and implementing the effective leverage related policies on this sector.

Other than that, the findings of this research will be advantageous to the investors when they make investment decision on the manufacturing firms. This is due to this research will figure out which firm specific factors will impact the firm's leverage significantly. By referring to these findings, the investors can conduct an analysis on the firms whether the significant firm specific factors will have positive or negative effect on the financial leverage. As a result, the investors may make appropriate investment decision by considering the impacts of the significant firm specific factors will have on the firm leverage.

1.7 Chapter Layout

This research includes five chapters. Chapter 1 will discuss about the research overview including the background of the relationship between the firm specific determinants and firm's leverage as well as the Malaysian manufacturing sector, problem statement, objectives of research, hypothesis study and significance of study. Besides, in chapter 2, the literature review of dependent variable and independent variables, theoretical framework, development of hypothesis will be provided. Followed by chapter 3, the research design, method of data collection, sampling technique, design and size, research instrument and data analysis will be presented in this chapter. Furthermore, chapter 4 shows the empirical results and data analysis that have conducted. In chapter 5, this research will state out the overall research findings, limitations of study, implication of policies and future recommendations.

1.8 Conclusion

In a nutshell, this chapter has provided an overview of the relationship between the firm specific determinants and firm's leverage from the Malaysian manufacturing sector. Besides, the incentives for this research to conduct this research and the contribution of this study also have been listed out in this section. The following

chapter will present about the past studies about the dependent and independent variables as well as the theoretical review for this research.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The literature review of Chapter 2 includes five parts to discuss in detail on the relationship of firm specific determinants and firm's leverage of Malaysia listed companies. First part is the discussion on a few theories that are related to the study. Second part is the empirical review on past studies on the variables. Third part is the outline of proposed conceptual framework of our model. Meanwhile, the development of hypotheses for this study is examined. The last part will be the conclusion for this chapter. The variables in this research include leverage, profitability, firm size, non-debt tax shield and growth.

2.1 Review of Relevant Theoretical Models

The section represents the theories and concepts that are related to this study. Theories are used to explain and define the relationship between the variables related in our research. Moreover, this also creates linkage between theoretical aspect and real life application of the research outcome.

2.1.1 Trade off Theory

The trade-off theory emphasizes that a balance achieved among tax advantage of borrowings and bankruptcy cost will determine the optimal debt ratio of a firm (Lim, 2012). In addition, Trade off theory is a theory on capital structure that focuses on tax savings that arise from debts financing, reduction in agency cost and bankruptcy cost, as well as the financial distress costs (Oruc, 2009). Trade off theory has a connection with the MM

theory that focuses on optimal capital structure, which was proposed by Miller and Modigliani.

Furthermore, they proposed the modified MM proposition which emphasized on the benefits gained from tax shield that are balanced by the financial distress cost and agency cost of the firm (Danso & Adomako, 2014). Meanwhile, to sum up, optimum leverage level can be attained through having advantages from repayment of interest and the debt issuing cost (Jahanzeb, Bajuri, Karami & Ahmadimousaabad, 2014). According to Sheikh and Wang (2010), this theory will probably select a capital structure that will maximize the firm's value through reducing the cost of prevailing market imperfections. Hence, the firm that has a large tax benefits, will finance its business operation by issuing more debt and this lead to the financial distress cost and advantages from tax shield is balanced (Chen, 2004).

Bankruptcy cost exists when the perceived chances of a firm to go bankrupt is more than zero. Bankruptcy costs are categorized into two types, which are liquidation cost and distress cost. Liquidation cost is the cost aroused from liquidating the firm's net asset whereas distress cost refer to the cost that exists when the shareholders believe that the firm will goes bankrupt. Moreover, high debt consists of both advantages and disadvantages, from the aspect of advantages is that higher debt can have large tax benefits, but on the other hand, higher debt will cause financial distress or even more severe, it can cause a firm to go bankrupt or force the firm to undertake liquidation (Awan & Amin,2014). In conclusion, it shows that financial distress cost are being offset by the benefits of tax shield which means that a firm that has a large financial distress cost might has little debt in their capital structure.

2.1.2 Pecking Order Theory

Pecking order theory can be considered as one of the most essential theory of capital structure. This theory is proposed by Myers and Majluf (1984). Pecking order theory stands a different perception as compare with trade off theory. This is because trade off theory does not take asymmetry information into consideration, while pecking order theory considers the conflict among insider and outsider caused by information asymmetry. They proposed that a manager which is an insider will have more information as compare to shareholders (outsider) and will perform in favor of old shareholders. Pecking order theory does not take optimal capital structure into consideration which in other words, it means that it assumes that there is no target capital structure (Luigi & Sorin, 2009). Thus, the firm will make their financing decision based on cost of financing with the preference orders of internal finance, debt and lastly is equity.

However, it is argued by some of the researchers that pecking order theory does not provide convincing evidence to the financing decision that used by the firm. According to a research done by Chen (2004) that study on the factors of capital structure among Chinese listed companies, it was found that both pecking order theory as well as trade off theory do not used by the Chinese firm. Instead, the Chinese listed company implemented the modified version of pecking order theory with the financing decision start from internal finance, equity and then last is debt. Firm use internal finance such as retained earnings as the first choice of financing investment is to avoid issuing cost. Meanwhile, Myers and Majluf (1984) suggest that that if the firm does not issue new security but use retained earnings as the first choice of financing investment, the problem of information asymmetric can be resolved too.

Debt is preferred as compared to equity because of the expensive cost of issuing equity and also the firm may not want to get lesser control over the firms when new equity is issued. Consequently, firm not prefer to get new

shareholders and would like to finance the project using the internal fund that are available. It is also argued that the cost of issuing equity becomes higher due to the asymmetric information between insider and outsiders increase (Sheikh & Wang, 2010).

2.1.3 Agency Theory

Stephen Ross and Barry Mitnick was the first to introduce the theory of agency around the 1970's (Mitnick, 2006). Stephen Ross is responsible for the introduction on economic theory of an agency, whereas Barry Mitnick is responsible for the institutional theory of an agency. Agency theory can be referred to as the agreement in which owners and shareholders [principal] that appoint a third party [agent] to perform management services on behalf of the principal to maximize shareholders wealth. Agency relationship looks into the manner a manager who represents agents, to perform in the best interests of shareholders who represent the principal of an organization. The shareholders will allow agents the authority on decision making (Jensen & Meckling, 1976).

Moreover, due to the conflict of interest, principal will experience reduction in wealth and this leads to the existence of agency cost. Agency cost arises when the both principal and agent are utility maximizers, there is a high probability that the agent will not act in the best interest of principal. It is due to the conflict of interest where agents will work for the benefit of their own-selves instead of best interest for the principals. This is due to agents believe that there are no additional benefits for them to outperform themselves, whereas agents might also be faced with liability and consequences if agents made a wrong decision on behalf of the principal. Hence, agents would sometimes make decision based on their own interest and not maximizing shareholders wealth in order to protect their job. However, this agency problem can be overcome by providing incentives and benefits to the agents in order to align the goals of agents and principals.

This would ultimately avoid the problem of conflict of interest and divergence of interest.

2.2 Empirical Review

2.2.1 Leverage

As we adopt the research work done by Pandey (2004), capital structure can be referred as the firm's debt level relative to equity on the balance sheet of the particular company. In other words, it is a picture that showed the amounts of capital that a firm has, and the method of financing that used to carry out growth initiatives. On the other hand, debt to asset ratio (debt ratio) is often used as the financial indicators of a company and also a proxy of capital structure. The particular ratio is computed by using the total sum of long-term debt and short-term debt divided by total asset. Long term debt includes all types of debt with the maturity beyond one year. Further, debt to asset ratio is chosen as our dependent variable since our research mainly focuses in studying the leverage of the firm.

Margaretha (2014) conducts a research to study the determinants of debt policy among Indonesia's public companies. In the study, non-financial companies which are publicly quoted in Indonesia Stock Exchange are applied by the researcher as sample data. The time frame for the sample data is five years, from year 2007 to year 2011. Margaretha uses six respective independent variables including firm size, profitability, tangibility of assets, tax rate, non-debt tax shield and growth rate, whereas leverage is used as dependent variable for the research study. Based on the findings, she concludes that tangibility of asset is positively related with leverage, while, growth rate has a negative impact on leverage. Meanwhile, firm size, non-debt tax shield and tax rate have no significant effect towards leverage. However, the results are differing from the findings that found by Thian (2012). The findings by Thian argue that leverage will be affected by firm

size in a positive way. Further, the negative result also had been found out between the determinant of profitability and leverage. The statement can be further explained by referring to pecking order theory, which the firm will tend to apply internal financing instead of external financing.

Another set of research which carried out by Onofrei, Tudoseb, Durdureanub and Antona (2015) to further study the key factors of capital structure for the micro and small enterprises in Romania. The dependant variable used in the study is debt ratio (debt to asset) with leverage used as estimator, while for independent variable, the researchers had chosen profitability with ROA as estimator, tangibility of asset, growth, firm size as well as liquidity. The panel data used include 385 companies that are based in Romania, and the sample year chosen is from 2008 to 2010. The empirical result proved that the study is consistent with pecking order theory. It cannot be denied that significant negative relationship is found to be existed between profitability and leverage. This probably can be explained by using theory of pecking order that proposed that high profitable firms are most probably to finance itself. Meanwhile, the result is contrast with the tradeoff theory, which suggests highly profitable firm will not have bankruptcy cost, so do high leverage.

2.2.2 Profitability

Profitability is defined as the ability of a firm to generate profits from its operation. It is a relationship between profit and expenditure from business activity utilizing of firm's assets (Gitman & Zutter, 2012). Besides, firm's profitability can be measured by two different measurements including accounting based measurements and market based measurements. Market based measures the long term view that is more forward looking, as the past performance is used to predict on anticipated firm's future performance (Wahla, Shah & Hussain, 2012). Whereas, accounting base measurement such as return on asset ROA, is measuring on short term based off of firm's

annual report figures that can be compared to the benchmark ratio. According to Hutchinson and Gul (2004) state that, accounting based measure is preferred over the market based measure because it represents the outcome from actions by the management of a company. Hence, ROA is used to study the relationship between firm's capital structure and firm's performance. According to Wahlen, Baginski and Bradshaw (2011) mention that ROA measures profitability from firm's total asset in order to generate revenue. Moreover Stickney, Brown and Wahlen (2007) propose that ROA shows profit from total asset, but ROA neglected the significance of costs of financing on the assets weather it is in the form of debt or equity financing.

According to Rajan and Zingales (1995), the result from Germany firms have a positive relationship between profitability and leverage. This may due to the higher tax exemption in Germany as compared to United State; 50% compared to 28% respectively, which high profitability firms will have higher leverage due to higher borrowings to take advantage of the tax shield. Besides, based on trade off model and agency cost suggest a positive relationship between profitability and leverage. Moreover, high profitability firm tend to have higher borrowings in order to take advantage of the tax shield which leads to higher leverage. According to Rajan and Zingales (1995) mention creditors are reluctant to give out loan to firms with low profitability. Hence, when a firm has low profitability, they expect bankruptcy cost to arise which leads firms to reduce borrowings which leads to lower leverage.

Negative relationship is found between profitability and leverage, as earnings increase firms will acquire less debt to finance their operations. The study of Margaretha (2014) on non-financial Indonesian listed company, found a negative relationship of profitability and leverage. This present when firm have a high profitability, the firms will prefer to fund their business operations with internal financing which cost less, because as they have a higher retained earnings (Myers, 1984). This in turn reduces firm's

reliance on external debt financing and thus decrease in leverage levels. Besides, study from panel observation of 208 KLSE listed company in Malaysia by using a two ways fixed effect model shows a significant negative relationship between profitability and leverage (Pandey, 2004). The particular result also tallies with another research done in Malaysia by Goh, Tai, Rasli, Tan and Zakuan (2018), which state the profitability is found to affect firm's leverage significantly and negatively among 184 manufacturing firms in Malaysia, within the time frame from 2011 to 2014. Because when profitability of a firm increases, the leverage will decrease because firms would not want to raise more external equity as this would dilute the ownership of the company. Furthermore, the study of Handoo and Sharma (2014) on 870 companies in India is also consistent that profitability and leverage are negatively correlated including on short term, long term and total debt ratio. In addition, research of Lim (2012) based on 36 listed companies in China also shows there is a negative relationship between profitability and leverage. This is consistent with the pecking order theory and past study done by Chen (2004) which shows less likely for debt financing when profitability is high. When the profitability of firm increases by 1%, the leverage will decrease by 34.9%. This result is also in line with Onofrei et al. (2015) study on 385 small firms in Romania which also state a negative relationship.

According to Pandey (2004) state from 208 KLSE Malaysia listed company by using the generalized method of moments GMM estimation the results confirm a saucer shaped relationship between probability and leverage. This shows a saucer shaped relationship which is a U shaped curve with a stretched flat bottom. This is in the case of given an initial base level of profitability for a firm, when there is an increase in profitability the firm will choose to internal finance their capital through retained earnings and reducing the cost of external financing (Myers & Majluf, 1984). Moreover, when firm is just having average profit levels, firm have no intention to increase or decrease any capital financing. Also, when firm having low profitability they will find not much benefit to issue more debt. Besides,

when firm has high profitability level, they may expand their business by increasing external financing and borrowing, the firm can also benefit from less taxable profit from tax shield.

2.2.3 Firm Size

Firm size represents the magnitude of a firm's asset holdings (Rajan & Zingales, 1995). The size of a firm takes into account of the value of current asset, fixed asset and market share. Firm size is an important determinant for capital structure which brings affect to the leverage. Literatures from past researchers used multiple ways to identify firm size which includes the natural logarithm of net sales or total assets, the market value of the firm, total assets at book value and average value of total assets (Sayilgan, Karabacak & Kucukkocaoglu, 2006).

According to research of Lim (2012) based on 36 listed companies in China shows there is a significant positive relationship between firm size and leverage. By taking another research done by Vijayakumaran and Vijayakumaran (2018) in China into account, larger firms tend to have higher leverage, and the particular positive relation is found significant among the sample size of all the Shanghai and Shenzhen stock market listed firms from 2003 to 2010. The results are consistent with the tradeoff theory where larger firm are more diversified and have less possibility of bankruptcy as compared to smaller firms, thus larger firms have less risk when taking higher debt financing. Besides, study of Acaravci (2015) based on 79 Turkish manufacturing firms, shows firm size and leverage have a positive relationship. This is because larger firm have more opportunity to borrow more debt financing. Larger firms have a larger appetite to utilize debt to fund their expansion than smaller firms (Titman & Wessels, 1988). According to Serghiescu and Văidean, (2014). The study of 20 Romanian listed companies, also reveal a positive relationship between firm size and leverage. This is due to large firms has access to lower cost of debts because

they have a better reputation and more transparency in the market (Rajan & Zingales, 1995). Hence, larger firm size contributes to higher leverage as borrowing and debt increases.

Based on a study of Onofrei et al. (2015) on 385 small firms in Romania revealed a negative relationship between firm size and leverage. Small firms may have higher leverage than larger firms, as small firms prefer short term borrowing through bank loans rather than issuing equity securities due to the high cost associated (Titman & Wessels, 1988). Besides, according to Rajan and Zingales (1995) the result from Germany firms have a negative relationship between firm size and leverage. This may be due to lower cost expected on financial distress where firms in Germany can be liquidated easily. Therefore, even the smaller firms are not hesitated to take on higher debts because they could easily liquidate in case of financial distress, as oppose to if liquidation is very costly in Germany. The research of Guner (2016) based on 131 publicly traded company in Turkey, revealed a negative relationship between firm size and leverage. Titman and Wessels (1988) mention as small medium firms trying to expand their business operations, they tend to increase loan borrowings from bank due to lower cost as compared to issuing long-term financial instruments, this intend increases firm's leverage.

According to Margaretha (2014) study on non-financial Indonesian listed company shows no significant relationship between firm size and leverage. Indicates both large and small firm are equally accessible to debts and borrowings, thus firm size does not affect leverage. Besides, Shah and Khan (2007) study on Pakistani non-financial firm there is a positive but insignificant relationship between firm size and leverage. This case, firm size does not matter due to firms may not fear of bankruptcy threats and manage to survive on negative equity figures. Meaning that the firm faces low bankruptcy cost and would take on borrowings regardless of firm size.

2.2.4 Non-debt Tax Shield

Non-debt tax shield is the corporate tax deduction by using depreciation expense. The depreciation expense of fixed assets can be used to offset corporate tax (Modigliani & Miller 1958). This is where firms obtain tax benefit of reducing corporate taxation rate by using depreciation cost. Besides, other than depreciation expense the cost of debt financing can also be used to obtain tax benefit (Deangelo & Masulis, 1980). This gives firms the incentive to acquire debt financing in order to receive tax incentives. However, this leads us to study on whether company would choose to increase or decrease leverage levels, when tax benefit is also able to be obtained by using depreciation expense. As a result, firms with higher depreciation cost would be expected to reduce borrowings and obtain less debt financing.

Based on our best effort positive relationship between non-debt tax shield and leverage was not found

Most of the past research had found a negative relationship between non-debt tax shield and leverage. According to research of Acaravci (2015) based on 79 Turkish manufacturing firms there is a negative relationship between non-debt tax shield and leverage. Firms with higher non-debt tax shield would need to acquire less debt as depreciation expense have the same benefit as debt financing in terms of tax benefits. Besides, based on the study of Lim (2012) based on 36 listed companies in China, the results show a significantly negative relationship between non-debt tax shield and leverage. This is because firms with high non-debt tax shield or high depreciation expense do not need to rely on debt to receive tax incentives this intend less debt financing and borrowing in order to achieve tax shield effect, thus less leverage. According to research of Lourenço and Oliveira (2017) state on 6184 Portugal firms there is a negative relationship between non-debt tax shield and leverage. Non-debt tax shield and debt financing are substitute for tax exemptions and firms with higher non-debt tax shield is

expected to acquire less debt thus lower leverage (Deangelo & Masulis, 1980).

According to the research of Shah and Khan (2007) that study on Pakistani non-financial firm found a not significant relationship, that non-debt tax shield is not related to bring effect to leverage. However, this result may be due to the fact that tax rates in Pakistan stays constant and does not increase based on the income level. Where companies are classified into groups and given a constant tax rate. Besides, the study of Margaretha (2014) and Haron (2018) on non-financial Indonesian listed company, shows that non-debt tax shield has no significant relationship with leverage. Hence, the amount of depreciation is not being considered when acquiring debt. Thus, depreciation expenses do not substitute for debts and borrowings in order to obtain tax shield for net income to exceed the next level of tax bracket. Results from Titman and Wessels (1988) on 469 US manufacturing firms and Chen (2004) on Chinese listed companies also shows the same result of no significant relationship between non-debt tax shield and leverage.

2.2.5 Growth

Growth is the ability of a firm to expand their business operations to achieve higher revenue, sales, assets and market shares. It has been confirmed that there is a relationship between growth and leverage on multiple studies (Mouamer, 2011) and (Vo, 2017). The difference in proxy for growth will bring different relationships with leverage. Literatures from past researchers used multiple ways to identify Growth which includes percentage change in total assets measured by the growth of total assets, research and development over sales and capital expenditures over total assets (Titman & Wessels, 1988).

According to research of Lourenço and Oliveira (2017) state on 6184 Portugal firms there is a positive relationship between growth and leverage. Reason being that funds being generated by firms internally are insufficient to support the rapid growth of the firm Myers (1984). Thus, in order to achieve higher growth rate firms would have to rely on more external debt financing. Besides, based on the study of Chen (2004) based on 88 listed companies in China, the results show a positive relationship between growth and leverage. It present when a high growth firm with many good investment opportunities but lack of fund. Firm will consider to raise fund according to the cheapest source firstly which is internal retained earnings following by external debt financing and lastly issuing new equity Myers (1984). When there is a shortage of retained earnings firms will first look into debt financing rather than issuing new equity because of the lower cost, hence higher growth of a firm results in higher leverage.

According to the study of Margaretha (2014) on non-financial Indonesian listed company shows a negative and significant relationship between growth and leverage. This is because firm with higher growth faces higher operational risk and risk of project failure, thus managers would not further increase any risk, and however they would instead reduce the use of debt in order to reduce credit risk. Hence, company with higher growth rate will maintain lower debt ratio which brings lower leverage (Rajan & Zingales, 1995). Besides, Shah and Khan (2007) study on Pakistani non-financial firm also found a negative relationship between growth and leverage. For rapidly growing firms' managers would choose risky projects for higher return and growth. However, the increase in risk will have creditors demanding for higher risk premium, with the higher cost of debt, companies will use lower debt financing. Furthermore, the research of Guner (2016) based on 131 publicly traded company in Turkey, revealed a negative relationship between growth and leverage. Growing firm tend to borrow less because growth is a capital asset which adds value to the firm but cannot be collateralized (Titman & Wessels, 1988). This is due to growth is an intangible asset that cannot be collateralized to a debt borrowing. Firms with

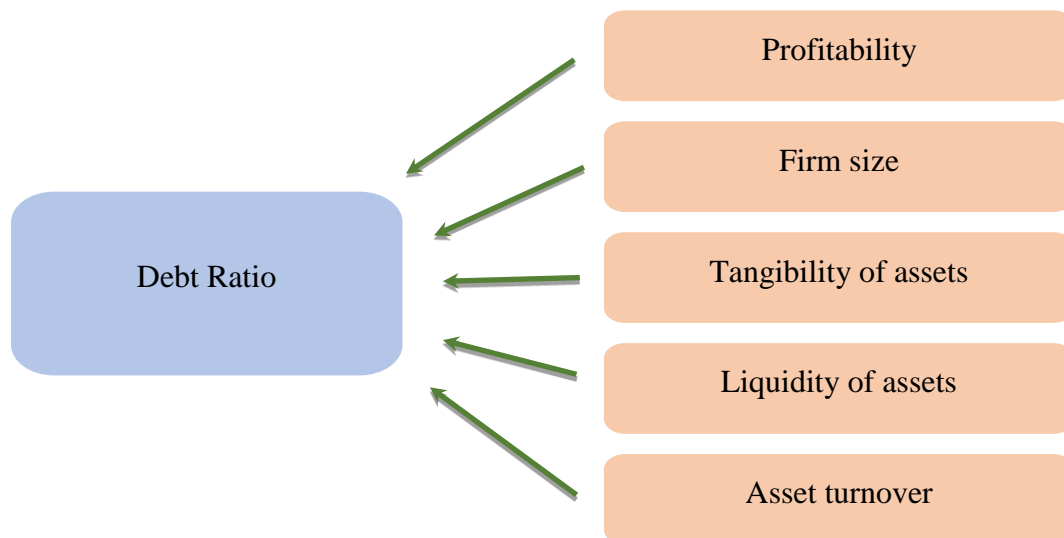
high growth will also not prefer debt financing for new investment opportunity that may arise, reason being that this would essentially be transferring wealth from shareholders to debt holders (Mouamer, 2011). In addition, the statement of growth correlates with firm's leverage in a negative and significant way can be further supported by the study done by Dakua (2018) in the background of steel business in India.

Based on our best effort a neutral or mixed relationship between growth and leverage was not found.

2.3 Theoretical Framework and Conceptual Framework

2.3.1 Relevant Theoretical Framework

Figure 2.1 Diagram of Relevant Theoretical Framework



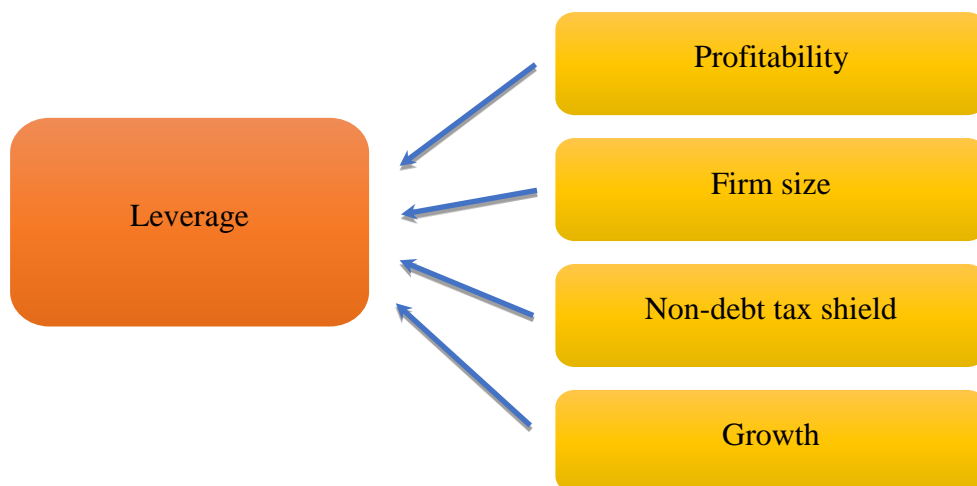
Adapted from: Procedia Economics and Finance (Serghiescu & Văidean, 2014)

$$\begin{aligned} \text{Function: } DR_{it} &= f(\text{PROF}_{it}, \text{SIZE}_{it}, \text{TANG}_{it}, \text{LIQUID}_{it}, \text{ASS.TURN}_{it}) \\ DR_{it} &= \beta_0 + \beta_1 \text{PROF}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{TANG}_{it} + \beta_4 \text{LIQUID}_{it} + \\ &\beta_5 \text{ASS.TURN}_{it} + \mu_{it} \end{aligned} \quad (1)$$

This study by Serghiescu and Văidean (2014) shows that DR is the proxy for debt ratio that indicates the level of leverage of a firm. Debt ratio in this study is measured by the ratio of debt to asset. Next, the researcher applied PROF which indicates profitability of a firm. The profitability is proxy by the return on asset which is measured by EBIT over total asset. Furthermore, the researcher used SIZE as an indicator to firm size which is measured by the natural logarithm of total asset. Besides, the researcher used TANG as an indicator for tangibility of asset which is measured by tangible asset over total asset. Moreover, the proxy LIQUID is used to indicate the liquidity of assets which is measured by liquid cash over total asset. Lastly, the ASS.TURN is the proxy for total asset turnover that indicate efficiency of a firm, it is measured by total sales over total assets.

2.3.2 Proposed Conceptual Framework

Figure 2.2 Diagram of Proposed Conceptual Framework



This framework showcases the relationships among the variables of the research. The proposed conceptual framework is developed to examine on the relationship among profitability, firm size, non-debt tax shield and growth to affect the leverage (debt to asset) of the listed companies in Malaysia.

Function: $DA_{it} = f(\text{PROF}_{it}, \text{SIZE}_{it}, \text{NDTS}_{it}, \text{GWTH}_{it})$

$$DA_{it} = \beta_0 + \beta_1 \text{ROA}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{NDTS}_{it} + \beta_4 \text{GWTH}_{it} + \mu_{it} \quad (2)$$

We adopted the model from previous researcher (Serghiescu & Văidean, 2014). We included their dependent variable debt ratio as leverage measured by debt to asset. Besides, we also adopted two independent variables which are profitability and firm size from the researcher into our model. Furthermore, we extended the model by adding two new independent variables which are non-debt tax shield and growth into our model as seen on equation (2).

2.4 Hypotheses Development

The H_0 indicates that the exogenous variable have no significant relationship to affect the endogenous variable, whereas H_1 indicates that the exogenous variable has a significant relationship to affect the endogenous variable. If H_0 is predicted to be false, we will reject H_0 showing a significant relationship between the exogenous variable and endogenous variable.

2.4.1 Profitability

H_0 : There is no significant relationship between firm's profitability and leverage.

H_1 : There is a significant relationship between firm's profitability and leverage.

2.4.2 Firm size

H_0 : There is no significant relationship between firm size and leverage.

H_1 : There is a significant relationship between firm size and leverage.

2.4.3 Non-debt tax shield

H0: There is no significant relationship between firm's non-debt tax shield and leverage.

H1: There is a significant relationship between firm's non-debt tax shield and leverage.

2.4.4 Growth

H0: There is no significant relationship between firm's growth and leverage.

H1: There is a significant relationship between firm's growth and leverage.

2.5 Expected Sign Table

Table 2.1: Expected Sign of Independent Variables

Independent variable	Signs	Expected sign
Profitability	Positive	Positive
	Negative	
	No relationship	
Firm size	Positive	Negative
	Negative	
	No relationship	
Non-debt tax shield	Negative	Positive

	No relationship	
Growth	Positive	Negative
	Negative	

Source: Developed for the research

2.6 Conclusion

In short, this chapter contains a comprehensive review of past studies and theoretical model used by past researchers. The dependent variable leverage (debt to asset) and four independent variables profitability, firm size, non-debt tax shield and growth were discussed. Besides, the figure 2.2 displays relationship between the variables. The next chapter will introduce the empirical model and also test whether the hypotheses are correctly stated.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter consist of research design, data collection method, sampling design, research instrument, data analysis and conclusion. This research aims to examine the relationship between the leverage of manufacturing companies in Malaysia and the independent variables such as profitability, firm size, non-debt tax shield and growth. Panel data is used in this research. The balanced data consists of 15 years annual data from year 2003 to year 2017.

3.1 Research Design

The major direction of this study is research design. Numerical data are collected when the definition of quantitative research is known to be standardized, and with systematic procedures to acquire the quantifiable information. Quantitative research is adopted to examine is there any factors that will affect left-hand side and right-hand side variables in a model. Causes and effects of the test to discuss the relationships will be discovered by using quantitative research in the study.

In this study, there are total of 129 listed manufacturing sector companies under Bursa Malaysia. However, out of the 129 companies, only a sample of 85 companies had been chosen as the target population in this research, after filtering those with incomplete data. This study determines the impact of the dependent variable which is leverage (the total of short term and long-term debt over total assets) on the independent variables which include profitability, firm size, non-debt tax shield and growth.

In this research, panel data analysis is applied to investigate 85 manufacturing sector companies for 15 years period. The secondary data which is applied by quantitative research were assembled from Bloomberg which provided in Universiti Tunku Abdul Rahman (UTAR) Library. The diagnostic tests for normality, multicollinearity and autocorrelation and the panel data analysis involves pooled ordinary least square (OLS) model, poolability test, fixed effects model (FEM) and random effect model (REM) and Hausman test are carried out to determine the best regression model. E-views 10 is the software used to analyze the quantitative research in this paper.

3.2 Data Collection Methods

The purpose of this research is to examine the relationship between firm specific determinants and firms leverage on Malaysia listed manufacturing firms. The chosen dependent variable in this research is leverage. Independent variables include profitability, non-debt tax shield, growth and firm size. Besides, secondary data is used in this study which were obtained from Bloomberg for the period of 15 years (2003-2017).

Table 3.1: Variables, Proxy, Description, Unit Measurement & Source

Variables	Proxy	Description	Unit Measurement	Source
Leverage	Total Debt	Financial obligation which the payable period more than one year and financed by company's asset defined as long term debt (Habib, Khan & Wazir, 2016). While, current debts less than a year indicated by the percentage of the total assets that is known as short term debt (Alsawalhah, 2012).	Unit	Bloomberg

		$\text{Debt to Asset} = \frac{\text{Short Term Debt} + \text{Long Term Debt}}{\text{Total Assets}}$		
Profitability	ROA	<p>The return of invested assets and also known as profitability is relative to its total assets (Daines, 2001).</p> $\text{Return on Asset} = \frac{\text{Net Income}}{\text{Total Assets}}$	Unit	Bloomberg
Firm Size	Revenue (log)	<p>Total volume or size of a firm measured by total revenue of a firm (Tifow & Savilir, 2015).</p> $\text{log of Firm Size} = \text{Log}(\text{Total Revenue})$	Unit	Bloomberg
Non-debt Tax Shield	Depreciation Expenses (log)	<p>A personal or corporation can achieve reduction in taxable income through claiming allowable deductions (Kemsley & Doron, 2002).</p> $\text{log of NDTs} = \text{Log} \left(\frac{\text{Total depreciation expenses}}{\text{Total asset}} \right)$	Unit	Bloomberg
Growth	Change in Revenue	<p>The rate which changes in revenues annually is known as growth (Gill, Biger & Mathur, 2011).</p> $\text{Growth} = \frac{\text{Revenue } t - \text{Revenue } t - 1}{\text{Revenue } t - 1}$	Unit	Bloomberg

Source: Developed for the research

3.3 Sampling Design

3.3.1 Target Population

Overview of manufacturing sector of performance, growth and contribution of the sector to the Malaysia economy. At first, we planned to include all 129 companies in the manufacturing sector. However, after we filtered out the data properly, there are plenty of missing data found. Therefore, we chose 85 companies out of the total 129 companies to be included as the targeted population of this research. Annually panel data of the 85 manufacturing companies are obtained for period of 15 years from 2003-2017.

The gross domestic product (GDP), external trade and job creation are mostly supported by the contribution of manufacturing sector. Next, 7.3 out of 100 of the Malaysian economy in the second quarter of 2014 are led by the fast-growing manufacturing sector companies (Bank Negara Malaysia, 2014). According to Department of Statistics (2015), with the same period of time in comparing with previous year, the manufacturing index increased 5.9% and in November 2015, 3.5% had been grown when compared with the same month in the past one year. The external sector is boosted by the domestic demand which is resilient, as a result manufacturing sector is expected to record better implementation.

3.3.2 Sampling Technique and Size

3.3.2.1 E-views

E-views also known as Electronic Views is used to run the regression analysis of the sampling technique for this study. Econometrics researchers are using E-views to predict, forecast and provide analysis result of data. Engagement of E-views 10 in this

research is to have diagnostic checking of normality, multicollinearity and autocorrelation. Furthermore, Poolability Test (POLS), Fixed Effect Model Test (FEM), Random Effect Model (REM) and also Hausman Test are conducted by using E-views 10 as well. This research obtains the empirical results by using E-views through T-Test, F-Test, R statistic, R^2 statistic and adjusted R^2 statistic too.

3.3.2.2 Sampling Size

In conducting a research, total observations in a population is called sampling size. If the size of the sample is large enough, the investigation is more likely to be truth due to a consistent estimation and less dispensed around the truth (Gujarati & Porter, 2009). In Bursa Malaysia Main Market of 2017, 129 companies are listed under manufacturing sector. However, only 85 companies are chosen due to missing data. Besides, the time period in this study is 15 years from 2003 to 2017. Therefore, there are 1275 of the total number of observations included to determine the impact of dependent variables and independent variables. Number of total observations are listed in Table 3.2.

Table 3.2 Complete Observations

	Total Company	Total Observations
Original Data	129	129x15= 1935
Missing Data	44	44x15=660
Final Data	85	85x15=1275

Source: Developed for the research

3.4 Research Instrument

3.4.1 Debt to Asset

According to Habib et al. (2016), financial obligation which the payable period is more than one year and financed by company's asset is defined as long term debt. Many researchers also apply the same ratio to measure leverage on their past studies as well (Tifow & Savilir, 2015; Alsawalhah, 2012; Gill et al., 2011).

Furthermore, current debts less than a year indicated by the percentage of the total assets that is known as short term debt to calculate short-term liability of the companies which mentioned by Alsawalhah (2012). Similarly, there are variety authors measure short term liability by using the same ratio (Habib et al., 2016; Tifow & Savilir, 2015; Gill et al., 2011).

$$Debt\ to\ Asset = \frac{(Short\ Term + Long\ Term)\ Debt}{Total\ Assets}$$

To define the total amount of debt relative to assets, total debt to total assets is known as leverage ratio. Hence, comparisons of leverage can be done across dissimilar companies by using this metric. According to researchers Rajan and Zingales (1995), long and short term debt are included in the broad ratio of total debt to total assets, as well as tangible and intangible assets.

3.4.2 Return on Asset

Return on assets (ROA) shows the ability of companies to generate net income from the total asset of a company. The ROA is a figure that is beneficial to investors, analysts and managers to determine how efficient a

company management is operating to generate earnings by using its total assets.

$$\text{Return on Asset} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Investors would more prefer to use operating returns before cost of borrowing, whereby adding interest expense into net income when making this calculation (Mintz & Smart, 2004). Division of net profit by total asset and net profit by total equity is the calculation of ROA and ROE respectively. According to Eisenberg et al. (1998), companies' performance is determined by ROA. Effect of industry conditions can be controlled by the industry median measurement of ROA as well as general economic conditions. On the other hand, Berger and Ofek (1995) used two industry-adjusted measures of profitability which are operating margin and ROA. Daines (2001) used ROA to measure firms' value as the researcher believes that a firm's profitability could directly affect its value. Besides, Soutes and Schvirk (2006) stated that there are three concepts of reporting income on ROA: using current operating, comprehensive, and net income.

3.4.3 Firm size

In an industry, companies' costs of production are varied with its size. The lowest average cost of production per unit of a firm is the best size of a business unit which is concerned by economists. Plant and establishment of a firm is the term that have impact to the decision about the business size.

$$\log \text{ of Firm Size} = \text{Log (Total Revenue)}$$

Firm size is determined by using firm's total revenue in log form. This term is adopted by various economy investigators to determine the firm size (Habib et al., 2016; Tifow & Savilir, 2015; Alsawalhah, 2012; Gill et al., 2011; Abor, 2005). According to Dang, Li and Yang (2018), the firm

characteristic is identified by firm size in empirical corporate finance. Nonetheless of corporate finance assesses the sensitivity of empirical results to differentiate measurements of firm size.

3.4.4 Non-debt Tax Shield

The relationship of corporate and personal taxes, with non-debt-related corporate tax shields is formed in a model of optimal leverage which presented by Deangelo and Masulis (1980). Aside from acquiring debt for tax relief and tax incentives, argument arises when depreciation expense can also achieve similar results for tax deductions. As a result, lower leverage of firm is seen from obtaining less debt financing on the firms with larger non-debt tax shields relative to their expected cash flow.

$$\log \text{ of } NDTs = \text{Log} \left(\frac{\text{Total depreciation expenses}}{\text{Total asset}} \right)$$

Only some parts of non-debt tax shield variable are captured, when capital equipment is associated with current tax deduction which suggested by Deangelo and Masulis (1980). This is also widely used by previous researchers, Lim (2012) and Acaravci (2015).

3.4.5 Growth

$$\text{Growth} = \frac{\text{Revenue } t - \text{Revenue } t-1}{\text{Revenue } t-1}$$

According to Pecking Order Theory, growth opportunities positively relate to debt ratio which also highlighted by Myers (1984) due to the asymmetric information between investors and firm managers. Capital assets is a factor that adding value to a firm but collateralization is not applicable and no

current taxable income is generated defines growth opportunities. A relation that is not positive between debt and growth opportunities argued in the previous subsection (Dragota & Semenescu, 2006). One of the determinants of leverage is growth opportunity which indirectly affect the firm value in terms of future growth potentials and profitability.

3.5 Data Analysis

E-views 10 is employed to estimate the panel data regression model and also diagnostic checking to identify econometric problems. The regression model of this research is shown as below:

Economic function: $f(\text{PROFit}, \log \text{ of SIZEit}, \log \text{ of NDTSit}, \text{ GWTHit})$

Multiple Regression Model: $DA = \beta_0 + \beta_1 \text{ROAit} + \beta_2 \log \text{ of SIZEit} + \beta_3 \log \text{ of NDTSit} + \beta_4 \text{GWTHit} + \mu_{it}$

Where:

DA = leverage

β_0 = Intercept for regression model

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

ROA = Profitability

log of SIZE = Firm Size

log of NDTS = Non-debt tax shield

GWTH = Growth

μ_{it} = Error term

3.5.1 Panel Data Technique

In this paper, panel data technique is applied to analyze the regression model. Panel data consist observation of multiple firms across a time period of multiple years. The two dimensions of observations where 'n' represent

companies will be the cross sectional and the 't' represent time period from year 2003 to 2017 will be the time series. the combination of cross sectional and time series data will be the panel data.

It's much challenging while obtain panel data since its costly and highly used up of time, however, as a student we can easily obtain the data from Bloomberg. Moreover, panel data can capture complexity of human behaviour since it generates high accuracy computation on parameters of a model (Hsiao, 2007).

3.5.1.1 Pooled OLS Model

Pooled ordinary least square (POLS) is the crossover of cross sectional and time series data. Based on Awuah-Agyeman (2016), pooled OLS model is employed to predict the regression model and its advantages is to detect effects that could not have been simply detected by using pure time-series data or pure cross-section. Besides, there is lower possibility of getting collinearity among variables. Pooled OLS also enhanced the degree of freedom with more variability and efficiency in order to be informative data. Time effect doesn't exist when intercepts and slopes is time invariant when they are constant across the companies. Furthermore, independent variables are not correlate with term of error. Pooled OLS model can be mathematically represented as below:

$$Y_{i,t} = \alpha + \beta X_{i,t} + \varepsilon_i$$

Where:

Y = Left-hand side variable of company i at time t

α = intercept

β = Coefficient of X

X = Right-hand side variable of company i at time t

ε = error term

3.5.1.2 Fixed Effect model (FEM)

Fixed effect model (FEM) controls any possible correlation that might exist among those independent variables and omitted variable by considering the μ_i as company fixed effect. The model is adding in dummy variables. Least squares dummy variable (LSDV) estimation is used to estimate the fixed effect model (Nilssen, 2014). Company fixed effect in the model acts as a crucial role in addressing the omitted variable problem. Omitted variable may lead to a bias result. FEM model can be precisely represented as below:

$$Y_{i,t} = \alpha + \beta X_{i,t} + \mu_i + \varepsilon_{it}$$

Where:

Y = Dependent variable of company i at time t

α = Intercept

β = Coefficient of X

X = Independent variable of company i at time t

μ = Company fixed effect

ε = Error term

3.5.1.3 Random Effect Model (REM)

With the name of error components model where randomly drew intercept of an individual unit from a large population with constant mean value is known as Random Effect Model (Gujarati & Porter, 2009). Term that is in the determination of varies of personality for different observations in a period of time are random error and it includes dummy variables.

Percentage of getting multicollinearity problem is condensed due to a decline of number of unknown parameters in REM and ended up reduced in numbers of independent variables (Habib et al., 2016).

Mathematically representation of model is as follow:

$$Y_{it} = \beta_1 i + \beta_2 X_{it} + u_{it} \quad Y_{it} = (\beta_1 + \epsilon_i) + \beta_2 X_{it} + u_{it} \quad Y_{it} = \beta_1 + \beta_2 X_{it} + \epsilon_i + u_{it}$$

Where:

β_1 = Mean for intercept

β_2 = Slope of independent variable X

X_{it} = Independent variable X

ϵ_i = Cross-section or individual-specific error component is random or not constant

u_{it} = Mixture of time series and cross-sectional error component

3.5.1.4 Poolability Hypothesis Test

Poolability hypothesis testing or known as likelihood ratio test is useful for determining whether the pooled OLS model or fixed effect model is most suitable for predicting the equation. It is also used to test whether the panel data is poolable and slopes of independent variables are the same across the time periods (Chuah, Cha, Ho, Ku & Ng, 2015). The null and alternative hypothesis are as:

H0: All companies with common intercept.

H1: All companies do not with common intercept.

The decision rule is to reject H null when F-statistics is lower than the significant level. Otherwise, do not reject null hypothesis. Rejection of null hypothesis mean the Pool-OLS model is invalid and FEM are more suitable.

3.5.1.5 Breusch and Pagan Lagrange Multiplier Test

This test decides to use either pooled ordinary least squares regression or random effect regression (Sia, Ong, Tan, Teo & Wong, 2016). Zero variances across the entities are BPLM test null hypothesis. Across the units, there is no significant difference. The null and alternative hypothesis are as:

H0: Random effect is not incurred, σ_i^2 , where $i=1, 2, 3, \dots$

H1: Random effect is incurred, σ_i^2 , where $i=1, 2, 3, \dots$

The decision rule is to reject H-null when probability value lesser than significant levels. Else, do not reject null hypothesis. Rejection of H-null meaning that random effect model (REM) is preferable than OLS model.

3.5.1.6 Hausman Test

Hausman test is adopted to test the empirical model which select between a Fixed or Random effect specification is suitable for estimating the equation and to examine the moderateness of the fixed effects and random effects models (Hasan, Ahsan, Rahaman, Alam, 2014). The null and alternative hypothesis as:

H0: REM is consistent and efficient.

H1: REM is inconsistent and inefficient.

The decision rule is to reject H null when the probability value of H test statistic is less than significant level. Otherwise, do not reject null hypothesis. Rejection of null hypothesis indicate that FEM is more appropriate than REM.

3.5.2 Diagnostic Checking

3.5.2.1 Multicollinearity

When the independent variables have a relationship with others, it's called multicollinearity. Besides that, detection of multicollinearity among not dependent variables required correlation coefficient which also called as R-Squared (Gujarati & Porter, 2009). Frisch (1934) define that multicollinearity is when there is a linear relationship among the independent variables in a particular regression model.

Few factors in the model will cause the case of multicollinearity happen which includes: The way of collecting data is not appropriate with the model, limitation on the population being sample or constraint in the model, model specification bias, an over-explained model and the independent variable exhibit same trend of pattern overtime.

Plenty methods that can use to detect the appearance of multicollinearity in a model. When there is a high R-square or high F statistic and few significant T-statistics will encourage us to reject the null hypothesis (H_0). The result is indicated that the independent variables are correlated between each other. Besides, a formula of $VIF=1/(1-R^2)$ can compute the condition number. High sample correlation coefficients are adequate but not necessary for multicollinearity (Gujarati & Porter, 2009). Multicollinearity may bring some effects in the model. Firstly, the large standard errors mean it will be large because small observed test statistics. Secondly, there will be a situation for large standard errors of the estimates. Thirdly, the Ordinary Least Squares (OLS) regression model is still Best Linear Unbiased Estimator (BLUE) and consistent even though when the multicollinearity is existed (Gujarati & Porter, 2009). Problem of having serious multicollinearity does not occur is when

VIF is less than 10. Otherwise, there is serious multicollinearity problem.

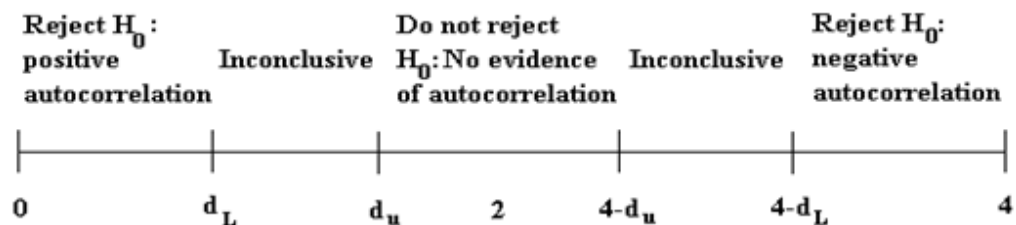
3.5.2.2 Autocorrelation

Autocorrelation occurs when a correlation between the error term of a series of data that is correlating with the error term of another data series. The autocorrelation problem occurs more frequently in time series data, while occurs frequently in cross sectional data. The Durbin-Watson test is used to detect autocorrelation problem in the model. The non-rejection zone is between d_U and $4-d_U$ and when the Durbin-Watson test statistic value falls in the non-rejection zone there is no autocorrelation problem in the model. Besides, when the test statistic falls on the left side between 0 and d_L it shows a positive autocorrelation. While, the test statistic falls on the right side between $4-d_L$ and 4 it shows a negative autocorrelation. Rejection of H_0 meaning of positive or negative autocorrelation. The null and alternative hypothesis as:

H_0 : There is no serial-autocorrelation problem

H_1 : There is serial-autocorrelation problem

Figure 3.1 Durbin-Watson Test Statistic Decision Rules



Source: Testing for serial correlation (Durbin & Watson, 1951)

3.5.2.3 Normality Test

Jarque-Bera test is performed on determining the normality of the error terms. JB-test is using residual, sample error term to test the normality of error term. JB-test is a combination of calculation of skewness and kurtosis of OLS residuals (Jarque & Bera, 1987). Skewness is used to measure the symmetry of the bell curve leaning towards the left or the right. Moreover, kurtosis is used to measure the height of the bell curve where shape of a normal distribution. The JB test formula using the squared of the kurtosis and skewness so that it will not be influenced by the negative value from either kurtosis or skewness. The null and alternative hypothesis as:

H0: Normal distribution of error terms.

H1: Abnormal distribution of error terms.

3.6 Conclusion

In short, this chapter has list out explanation on the theoretical model, empirical model, model estimation, diagnostic tests, source of data and conclusion remarks. Based on our research data collected, there are several methods and models that could be used to apply to our research. In addition, we also have elaborated for all econometric methods and models which are related. In Chapter 4, we will perform the panel data regression to determine the most suitable model, following by diagnostic testing.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

Referring to chapter 3, research methodology on the research design, data collection method, techniques of data analysis and treatment of econometric problems is discussed. The log transformation of independent variable non-debt tax shield [log of NDTs] and firm's size [log of SIZE]. Next, the test on panel data analysis will be carried out to further identify the accuracy and trustworthiness of the data. Results of the significance of hypothesis will also be recorded in a systematic order then followed by a conclusion.

4.1 Descriptive Analysis

Table 4.1: Descriptive Analysis from Year 2003 – 2017

	DA	ROA	log of SIZE	log of NDTs	GWTH
Mean	0.440765	0.260812	5.405497	-3.601105	9.582449
Median	0.355856	0.066354	5.246497	-3.508705	6.344409
Maximum	85.70968	236.0000	9.917982	4.288690	553.1648
Minimum	0.017748	-1.915680	1.367161	-7.592352	-91.59161
Std. Dev.	2.398699	6.608680	1.414626	0.688658	38.54042
Skewness	35.27394	35.64110	0.677311	0.450525	6.504048
Kurtosis	1254.388	1271.861	3.588481	24.22395	71.14057
Observations	1275	1275	1275	1275	1275

Notes: Table 4.1 presents the descriptive statistics table for the dependent variable and the independent variables, which includes leverage (DA), Return on Asset (ROA), Firm's Size (log of SIZE), Non-debt Tax Shield (log of NDTs) and Growth (GWTH). The Malaysia manufacturing company's panel data observed for fifteen years period, from year 2003 to 2017. Observations N= 85 manufacturing companies. Number of panel data observations for fifteen years = 1275.

Source: Developed for the research (E-views 10)

4.1.1 Debt to Asset (DA)

According to table 4.1, the debt to asset DA has a mean value of 0.440765. In addition, the DA reaches the maximum of 85.70968 and also the minimum of 0.017748. However, the study of Vo (2017), state that the DA of Vietnam firms has a higher mean value of 0.4781. Meanwhile, the research of Mouamer (2011) shows the DA of Palestine firms to have a lower mean value of 0.430. Based on the results, Malaysia manufacturing firms has a lower average debt to asset of 0.440765, as compared to Vietnam 0.4781 but higher than Palestine 0.430. Hence, Malaysia firms have lower total liabilities as compared to Vietnam but higher compared Palestine listed firms.

4.1.2 Return on Asset (ROA)

According to table 4.1, the Return on Asset (ROA) has a mean value of 0.260812. In addition, the ROA reaches the maximum of 236.0000 and also the minimum of -1.915680. On the other hand, based on Onofrei et al. (2015) firms in Romania has shown a lower mean value of 0.1416. Furthermore, the study of Margaretha (2014) indicates the ROA Indonesia firms, has a low mean value of 0.074 which is significantly lower as compared to this study. Based on the result, Malaysia firms have high efficiency in utilizing total assets to generate revenue when compared to Romanian and Indonesian firms.

4.1.3 Firm's Size (log of SIZE)

According to table 4.1, the firm's size (log of SIZE) has a mean value of 5.405497 and a median of 5.246498. In addition, the firm's size reaches the maximum of 9.917982 and also the minimum of 1.367161. However, according to a research done by Chen (2004). The China firm's size has a

higher mean at 8.8078 with the maximum and minimum value of 10.3111 and 6.8277 respectively. Moreover, the study of Vo (2017) state that the DA of Vietnam firms has a higher mean value of 11.9565 and median of 11.9068 with the maximum and minimum value of 14.1629 and 9.9576 respectively. Based on the results, it shows Malaysia firms have a smaller firm's size as compared to Vietnam and China firms. These can be seen through a lower average firm's size and also lower maximum and minimum value of Malaysia companies.

4.1.4 Non-debt Tax Shield (log of NDTs)

According to table 4.1, the Non-debt Tax Shield (log of NDTs) has a mean value of -3.601105. In addition, the NDTs reaches the maximum of 4.288690 and also the minimum of -7.592352. On the other hand, based on the study of Margaretha (2014) indicates the NDTs of Indonesia firms, has a higher mean value of 0.020 which is significantly higher as compared to this study. Besides, according to a research done by Chen (2004) the NDTs of China firms has a higher mean at 0.772868. Based on the results, it shows that Malaysia firms has lower NDTs than China firms and Indonesian firms. This indicates that Malaysia firms has lower tax-deductible depreciation expense than China and Indonesian firms.

4.1.5 Growth (GWTH)

According to table 4.1, the revenue growth has a mean value of 9.582449. In addition, the growth reaches the maximum of 553.1648 and also the minimum of -91.59161. However, the study of Margaretha (2014) Indonesia firms has a higher mean value of 15.60, with the maximum and minimum value of 151.90 and -23.80 respectively. Furthermore, a study done by Chen (2004) Chinese firms growth has a higher mean at 17.01884 with the maximum and minimum value of 183.8353 and -54.5685 respectively.

Based on the results, it shows Malaysia firm has lower average growth in revenue as compared to China and Indonesia. However, Malaysia firm's growth has the highest maximum and lowest minimum value as compared.

4.2 Panel Data Analysis

4.2.1 Poolability Test

Table 4.2: Poolability Test Result

Test Statistic	P-Value	Decision
22.502896***	0.000	Reject H null, FEM is preferred Proceed to Breusch-Pagan Lagrange Multiple (BPLM) Test

Note: *, **, *** indicates the rejection of the null hypothesis at 10%, 5% and 1% significance levels.

Source: Developed for the research (E-views 10)

H0: There is a common intercept on all the companies. POLS is preferred

H1: There is no common intercept on all the companies. FEM is preferred

Based on the result of table 4.2 the Likelihood Ratio Test is on whether POLS is preferred or FEM is preferred. The test statistic of 22.502896, this indicates significant at 1% significance level. As the p-value 0.000 is lower than 1% significance level. Hence, we reject H null, and FEM is preferred. In this case, proceed to Breusch-Pagan Lagrange Multiple (BPLM) Test.

4.2.2 Breusch-Pagan Lagrange Multiple Test

Table 4.3: BPLM Test Result

Test statistic	P-Value	Critical value	Decision
3006.908***	0.000	2.7055* 3.8415** 6.6349***	Reject H null, REM is preferred Proceed to Hausman Test

Note: *, **, *** indicates the rejection of the null hypothesis at 10%, 5% and 1% significance levels.

Source: Developed for the research (E-views 10)

H0: There is a common intercept on all the companies. POLS is preferred

H1: There is no common intercept on all the companies. REM is preferred

Based on the result of table 4.3 Breusch-Pagan LM test, the test statistic is 3006.908. This indicates significant at 1% significance level. As the BPLM test statistic is larger than all critical values. Hence, we reject H null, and REM is preferred. In this case, proceed to Hausman Test.

4.2.3 Hausman Test

Table 4.4: Hausman Test Result

Test Statistic	P-Value	Critical value	Decision
6.960592	0.1380	7.7794* 9.4877** 13.2767***	Do not reject H null, REM is preferred REM is the most suitable model

Note: *, **, *** indicates the rejection of the null hypothesis at 10%, 5% and 1% significance levels.

Source: Developed for the research (E-views 10)

H0: There is a common intercept on all the companies. REM is preferred

H1: There is no common intercept on all the companies. FEM is preferred

From the result of table 4.4 Hausman Test, the test statistic is 6.960592, where the test statistic is lower than all critical values. This indicates test statistic not significant even at 10% significance level. Hence, we do not reject H null, and REM is preferred. In this case, Random Effect Model REM is the most suitable model to represent our findings. Hence, the REM will be used for the following diagnostic checking.

4.3 The Final Econometric Model

The Random Effect Model REM is the most suitable model to represent our findings and it will be used to for the following diagnostic checking by using E-views 10. Table 4.5 shows the original results of REM regression which are used to describe the following equation (3):

$$DA_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 \log \text{ of SIZE}_{it} + \beta_3 \log \text{ of NDTs}_{it} + \beta_4 GWTH_{it} + \mu_{it} \quad (3)$$

Table 4.5: Results of REM regression

Total number of observations: 1275 (85 listed manufacturing firms, 15 years)

Dependent variable: Leverage (DA)

Variables	Coefficient	P-value
β_0	0.639408	0.0000
ROA	0.359809	0.0000
Log of SIZE	-0.024123	0.0011
Log of NDTs	0.044723	0.0000
GWTH	-0.000108	0.3161

Notes: Return on Asset (ROA), Firm's Size (SIZE), Non-debt Tax Shield (log Of NDTs) and Growth (GWTH).

Source: Developed for the research (E-views 10)

R-squared = 0.996333

F-statistic = 86272.15

Probability F-statistic = 0.0000

$$DA_{it} = 0.639408 + 0.359809 ROA_{it} - 0.024123 \log \text{ of } SIZE_{it} + 0.044723 \log \text{ of } NDTs_{it} - 0.000108 GWTH_{it} + \mu_{it} \quad (4)$$

The above equation (4) shows the final econometrics model equation with coefficient substituted from table 4.5 into the Equation (3).

4.3.1 Interpretation of Slope Coefficient

$$\beta_0 = 0.639408$$

Assume all independent variables (ROA, log of SIZE, log of NDTs & GWTH) are equal to zero, on average the leverage of 85 listed manufacturing firms will be 0.639408 units.

$$\beta_1 = 0.359809$$

For every one unit increase of return on asset (ROA), on average the leverage of 85 listed manufacturing firms will increase by 0.359809 units, *ceteris paribus*.

$$\beta_2 = - 0.024123$$

For every one unit increase of firm's size (log of SIZE), on average the leverage of 85 listed manufacturing firms will decrease by 0.024123 units, *ceteris paribus*.

$$\beta_3 = 0.044723$$

For every one unit increase of non-debt tax shield (log of NDTs), on average the leverage of 85 listed manufacturing firms will increase by 0.044723 units, *ceteris paribus*.

$$\beta_4 = - 0.000108$$

For every one unit increase of growth (GWTH), on average the leverage of 85 listed manufacturing firms will decrease by 0.000108 units, *ceteris paribus*.

4.4 Diagnostic Checking on Selected Model REM

4.4.1 Normality Test

Table 4.6: Normality Test Result

Jarque-Bera Test Statistic	P-Value	Critical value	Decision
21102.79***	0.0000	1081.3794* 1098.5208** 1131.1587***	Reject H null, not normally distributed

Note: *, **, *** indicates the rejection of the null hypothesis at 10%, 5% and 1% significance levels.

Source: Developed for the research (E-views 10)

H0: The error term is normally distributed

H1: The error term is not normally distributed

Jarque-Bera test is performed to determine the normality of the error terms. Based on Table 4.6, the JB-test statistic of 21102.79 which indicates significant at 1% significance level. As the JB test statistic is larger than all critical values. Hence, we reject H-null, this shows that the error term is not normally distributed.

Moreover, referring to the Central Limit Theorem the error term is assumed to be normally distributed when the research sample size is more than 100 observations (Phillips & Moon, 1999). In this case, this research includes 1275 observations. Thus, the random effect model is assumed to be normally distributed.

4.4.2 Multicollinearity

Table 4.7: Matrix of Correlation for the Variables

	ROA	log of SIZE	log of NDTS	GWTH
ROA	1.0000			
log of SIZE	-0.01862	1.0000		
log of NDTS	0.32128	0.04966	1.0000	
GWTH	0.01749	0.06225	-0.04368	1.0000

Notes: Return on Asset (ROA), Firm's Size (log of SIZE), Non-debt Tax Shield (log of NDTS) and Growth (GWTH).

Source: Developed for the research (E-views 10)

Multicollinearity is performed to find out if the linear relationship of each independent variables exists and correlates with each other. According to Gujarati and Porter (2009) the Pearson correlation is useful to identify seriousness of multicollinearity problems which may exist between the independent variables. As the results of the test has a benchmark of up to 0.80 or 80% is considered as a serious multicollinearity problem. Referring to Table 4.7, all of the variable pairs do not have multicollinearity problem as they have a pair wise correlation of less than 0.80 or 80%.

Table 4.8: VIF for every Explanatory Variable

Variable	R ²	$VIF = 1 / (1 - R^2)$	Result
ROA	0.105569	1.11803	Multicollinearity does not exist
log of SIZE	0.000304	1.00030	Multicollinearity does not exist
log of NDTS	0.109119	1.12248	Multicollinearity does not exist
GWTH	0.007341	1.00740	Multicollinearity does not exist

Notes: Return on Asset (ROA), Firm's Size (log of SIZE), Non-debt Tax Shield (log of NDTS) and Growth (GWTH). VIF=variance inflation factors.

Source: Developed for the research (E-views 10)

The Variance Inflation Factor (VIF) is calculated by $VIF = 1 / (1 - R^2)$, this is used to examine the seriousness of the multicollinearity problem in the model. When the VIF is between the ranges of 1 to 10, this shows there is no serious multicollinearity problem in this model. Based on table 4.8 all independent variables show the value of variance inflation factors VIF of lower than 10. This further confirms that there is no any serious multicollinearity problem exists in the model.

4.4.3 Autocorrelation

Table 4.9: Durbin-Watson Test

Durbin-Watson Test Statistic	Critical value DW table 5%	Critical value DW table 1%	Decision
0.4747	DL = 1.718 DU = 1.809	DL = 1.632 DU = 1.715	Reject H null, Positive serial correlation exist at both 5% and 1%

Note: Rejection area from 0 to DL for positive correlation; rejection area from 4-DL to 4 for negative correlation

Source: Developed for the research (E-views 10)

H0: No serial-autocorrelation

H1: Serial-autocorrelation

Durbin-Watson test is performed to detect the degree of similarity on the serial correlation between a variable's current value and its past values. Based on table 4.9 the Durbin-Watson test statistic of 0.4747 which falls within the rejection area of 0 to DL. With the DL of 1.718 at 5% and 1.632 at 1%, this indicates that a positive serial correlation exists. Hence, we reject H null at both 5% and 1% Durbin-Watson critical value, concluding the model consists of the positive autocorrelation problem.

4.5 Inferential Analysis

4.5.1 R-Squared

Table 4.10: R-squared Result

	R-squared	Adjusted R-squared
Model: DA	0.99633	0.99632

Source: Developed for the research (E-views 10)

The value of R-squared is used to indicate of how much the degree of variation of dependent variable that can be explained by the independent variables. The R-squared is set to be in a boundary of 0.01 to 1.00 which is 1% to 100% range. For instance if the R-squared value is high at close to 100% this indicates that all of the variation of the endogenous variable can be explained by the variation of exogenous variables. Nevertheless, a lower range of R-squared value shows the variation of the dependent variable is less likely caused by the variation of independent variables. Based on table 4.10 shows that R-squared value of the random effect model on debt to asset is 0.99633 or 99.63% which is very close to 100%. This result indicates that 99.63% of the variation of DA can be explained by the change in ROA, log of SIZE, log of NDTs, and GWTH.

The value of adjusted R-squared is used to modify the R-squared value for adjusting the number of the variables included in the model. Based on table 4.9 shows the value of adjusted R-squared to be 0.99632 or 99.63% which is very close the R-squared value. This result shows 99.63% of the variation of DA can be explained by the change in ROA, log of SIZE, log of NDTs, and GWTH.

4.5.2 F-Test

Table 4.11: F-Test Result

F-Test Statistic	P-Value	Decision
86272.15***	0.0000	Reject H null, The whole model is significant.

Note: *, **, *** indicates the rejection of the null hypothesis at 10%, 5% and 1% significance levels.

Source: Developed for the research (E-views 10)

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

$$H_1: \text{At least one } \beta_i \neq 0 \text{ where } i = 1, 2, 3, 4$$

The result of F-test is used to determine the whole model significance of the variables included in the model. This further confirms the relationship of the independent variables to significantly affect the dependent variable. Based on table 4.11 the F-Test Statistic of 86272.15 which indicates significant at 1% significance level. As the p-value 0.000 is lower than 1% significance level. Hence, we reject H null, and there is significant evidence to conclude that the whole model is significant.

4.5.3 T-statistic

Table 4.12: T-Test Result

Independent Variables	T-Test Statistic	P-Value	Critical value	Decision
ROA	527.2652***	0.000	1.645* 1.960** 2.576***	Reject H null, Significant relationship
log of SIZE	-3.274991***	0.0011	-1.645* -1.960** -2.576***	Reject H null, Significant relationship

log of NDTS	4.899550***	0.0000	1.645* 1.960** 2.576***	Reject H null, Significant relationship
GWTH	-1.003001	0.3161	-1.645* -1.960** -2.576***	Do not reject H null, No significant relationship

Note: *, **, *** indicates the rejection of the null hypothesis at 10%, 5% and 1% significance levels. Return on Asset (ROA), Firm's Size (log of SIZE), Non-debt Tax Shield (log of NDTS) and Growth (GWTH).

Source: Developed for the research (E-views 10)

H0: $\beta_i = 0$

H1: $\beta_i \neq 0$

The result of the T test is used to identify the significant relationship between each of the independent variables to the dependent variable. Based on table 4.12 the T-test statistic shows only GWTH variable is not significant in explaining leverage due to the test statistic falls under the non-rejection region. However, ROA, log of SIZE and log of log of NDTS are significant at 1% significance level.

4.6 Conclusion

The results from panel data analysis of hausman test shows that the REM random effect model is the most suitable model. Thus, we used the random effect model output results to continue with the diagnostic testing. Followed by inferential analysis of the significance of the variables as well as significance of the whole model. Results shows that the whole model is significant, whereas only the independent variable GWTH is insignificant.

CHAPTER 5: DISCUSSION, IMPLICATION AND CONCLUSION

5.0 Introduction

By referring to Chapter 4, the empirical results of descriptive analysis and panel data test are presented. The diagnostic test and inferential analysis are fell under the panel data test. In Chapter 5, the empirical results and major findings gained from those statistical analyses in the previous chapter will be further discussed. The implication of study also will be presented in this chapter. Other than that, we will go into the limitations for this paper and followed by the recommendations for future study. Lastly, a summary of our research's findings will be presented.

5.1 Summary of Statistical Analysis

In Chapter 4, the descriptive analysis for the dependent variable and independent variables was conducted on our sample data of 1275 observations for 15 years to basically describe the result patterns. On the other hand, the panel data test was employed as well to provide the empirical results on the significance of exogenous variables towards endogenous variable.

According to the panel data test results, we found that there are three independent variables which significantly affect the firm's leverage, that are profitability, firm size and non-debt tax shield. Among these three variables, the positive sign for profitability and non-debt tax shield means they are positively affecting the firm's leverage, while the negative sign for firm size indicates it will show the negative effect on the leverage of firm.

In contrast, growth does not show significant impact on firm's leverage. Further, the negative sign for growth also indicates the effect it brings to firm's leverage is negative in nature. By referring to statistical analyses results, we can get to know each of the independent variables will have different impact on the dependent variable, hence the reasons and facts behind the results will be further explored in the next section.

5.2 Review of Major Findings

Table 5.1 Summary of Hypothesis Decision for the Independent Variables

Independent Variable	Expectation Sign and Significance	Regression Result
Profitability	Positive and Significant	Positive and Significant
Firm Size	Negative and Significant	Negative and Significant
Non-debt Tax Shield	Positive and Significant	Positive and Significant
Growth	Negative and Significant	Negative and Insignificant

Source: Developed for the research (E-views 10)

5.2.1 Profitability

Based on the panel regression results shown in Table 5.1, profitability is found to have a significant positive effect on the leverage of firm. Hence, this study rejects the H null hypothesis. The particular result showed profitability is a positive and significant variable towards leverage, which tallies with the expected sign stated in Chapter 2. Further, the actual positive result is consistent with trade off model which suggests the higher the profitability, the higher the leverage will be due to low bankruptcy risk. Furthermore, the actual result also can be further supported by the prior researches done by Rajan and Zingales (1995), Yusuf, Yunus and Supaat (2013) and Shah and Khan (2007).

From the perspective of Malaysia, the positive relation between profitability and firm's leverage was found among the electrical and electronics manufacturing firms. Whenever a firm is having high profitability, its intention in adopting debt financing will increase as the profit level will continue to increase due to tax benefits. In other words, the high profitability firms will be able to enjoy higher profit continuously by increasing the leverage level (Yusuf et al., 2013).

To further support this result, the finding from Rajan and Zingales (1995) can be taken into account. The particular authors had pointed out profitability is positively related with leverage among the Germany firms while the result is in contrast to the United States firms. The reason behind this is the tax exemption percentage in Germany was 50% which was higher than United States which was 28% during that period. In other words, the Germany firms would be entitled to lower taxation and this would encourage them to have higher borrowings since they were able to enjoy the higher profit, in turn the firms would have higher leverage ultimately. Other than that, for those firms which have high profitability, they will have higher chances to engage in financing in the credit markets as they are believed having low bankruptcy risk as well as participating in diversified businesses. Consequently, these may be other reasons for the Malaysian manufacturing firms with higher profitability to have high borrowings so do higher leverage as compared to the lower profitability firms.

In addition, the positive relationship between profitability and leverage also can be observed in the paper done by Shah and Khan (2007). In this study, the profitability showed positive impact on firm's leverage among certain sectors which are chemical, power, paper and miscellaneous in Pakistan. As stated by Malaysia Productivity Corporation (2017), the chemical, power and paper sectors are considered as sub-sectors in Malaysian manufacturing sector which mainly focus on export businesses. In this case, it is reasonable to say that the determinant of profitability in Malaysian manufacturing sector will also show the positive impact on firm's leverage as the business

nature and operation model applied by both firms are considered similar in the particular sector in both countries.

5.2.2 Firm Size

By referring to the results from Table 5.1, there is a significant negative relation between firm size and leverage which have confirmed the anticipated positive relation stated in Chapter 2. Therefore, the study rejects H null hypothesis. In addition, the actual results are backed by the pecking order theory that points out the large firms are less likely to have information asymmetry in turn they will be able to apply equity financing as compared to small firms, so do their leverage will be lower. The regression result also can be further proved by some previous studies done by Onofrei et al. (2015), Rajan and Zingales (1995), Titman and Wessels (1988), Guner (2016), Alves and Ferreira (2011), Bas, Muradoglu and Phylaktis (2009), Frank and Goyal (2003), Hussain and Miras (2015) and Hijazi and Tariq (2006).

Based on the result gained from the study which conducted among the Malaysian food producer firms, the firm size is found out contributes a significant impact to firm's leverage negatively (Hussain & Miras, 2015). In addition, the debt financing level of a food products firm will decrease follow by the increase of its size. The reason which drives to this result is the difficulty level for large firms to get loan approval from the lenders is high as caused by asymmetric information. Additionally, food products sector is categorized under Malaysian manufacturing sector which primarily focus on doing domestic businesses (Malaysia Productivity Corporation, 2017). In other words, the result which firm size is negatively related with firm's leverage in Malaysian manufacturing sector in current study is being supported.

According to the study done by Titman and Wessels (1988), firm size was observed to have negative impact on leverage. In detailed, large firms will

tend to apply equity financing as they are able to value the new issued equity accurately as compared to small firms. This will lead them to have lower leverage in the event their firm size is keep increasing. In other words, small firms tend to apply debt financing on short term basis instead of issuing equity. This is due to the associated cost of equity and long-term financial instruments issuance will be higher by comparing with the borrowing cost, hence small firms are believed to have higher leverage. As discussed, the negative result from this paper also provides a strong support for our finding.

The negative result of firm size in current study also can be explained in other way according to Rajan and Zingales (1995). The authors had mentioned the firm size will negatively affect leverage in their study based on Germany firms. In Germany, the firms are able to liquidate in an easy way due to lower cost of financial distress. Consequently, high level of debt financing will be applied by the smaller firms without hesitating if the particular country the firms located has low financial distress cost. The reason for the small firms to take more debt is they only need to allocate small portion of capital for financial distress cost. As discussed above, the debt financing is not the priority financing method for the large manufacturing firms as they are less likely to face the operational risk, therefore low financial distress cost will not be a reason for them to take more debt.

5.2.3 Non-debt Tax Shield

Similar to a number of previous studies, non-debt tax shield does contribute significant positive impact on leverage in this study. The actual result is in line with the expected sign mentioned in Chapter 2, and this can be further supported by Bradley, Jarrell and Kim (1984) and Vuran, Tas and Adiloglu (2017).

As reported by Bradley et al. (1984), the reason for non-debt tax shield to have positive effect on leverage can be explained by applying the “secured debt” hypothesis which had been suggested by Scott (1977). This hypothesis points out in the event a firm has heavy tangible assets investment, it needs to bear high expenses, however it is entitled to high tax credit at the same time, therefore it will have high cash flow as well. Furthermore, the firm will apply high level of debt financing as it is able to provide the tangible asset as collateral to secure the debt, so does the confidence of creditors will be increased followed by charging the firm with lower interest rates. In other words, the Malaysian manufacturing firms will definitely engage in heavy tangible assets investment since the machinery and technical equipment are the core components for their business operation. Therefore, we may make a conclusion which the manufacturing firms with higher non-debt tax shield as caused by huge amount of tangible assets still will choose to apply debt financing.

The positive relation between non-debt tax shield and leverage also can be found in the study by Vuran et al. (2017). By referring to this paper, non-debt tax shield only shows the positive significant effect on leverage when the service firms sample size had been tested. This is due to those services firms had invested heavily in tangible assets, hence high leverage was resulted. This finding also proves the “secured debt” hypothesis mentioned above and consistent with the positive results in this study.

5.2.4 Growth

By taking the expected sign into account, growth is anticipated to have negative and significant impact on firm’s leverage. The actual result shows, differently, for negative and insignificant result, thus failed to reject H null hypothesis. The negative sign is supported by trade off theory, while the inconsistent result can be explained in a more advanced way based on the study by Margaretha (2014), Rajan and Zingales (1995), Shah and Khan

(2007), Titman and Wessels (1988), Mouamer (2011), Sheikh and Wang (2011) and Baker and Wurgler (2002).

By referring to the study done by Margaretha (2014), the project failure rate for a high growth firm is expected higher than other firms. This can be further elaborated by the statement which the existed risk from new project has already maintained at high level, therefore in order to prevent the firm from keeping increase the financial and operational risk, the debt financing will not be a priority for it. In this case, we may get to know the reason for the manufacturing firms in Malaysia are less likely to apply debt financing is most of them may possess high growth opportunities, and wish to escape from additional credit risk.

Other than that, the value will be added to a firm by its growth opportunities in the form of capital assets instead of tangible assets. Consequently, the high growth firms are expected not to take so much debt as their capital assets cannot be provided as collateral. In other words, the conclusion for negative results in this study can be explained in another way which the Malaysian manufacturing firms with higher growth opportunities will have less intention in applying debt finance because of the lack of collateral (Titman & Wessels, 1988).

After discussed the findings which point out growth will negatively relate to leverage by different studies above, the insignificant and negative relationship between these two tested variables from the study by Chen and Zhao (2006) will be taken into account to support our result in an advanced way. As reported by Chen and Zhao (2006), the robustness for negative relation between market-to-book ratio as measured by growth opportunities and leverage is not valid enough. This statement can be explained by using market timing hypothesis which introduced by Baker and Wurgler (2002). According to this hypothesis, the market-to-book ratios level will drive the firm leverage. To be more specifically, whenever a firm has higher market-to-book ratios, it is expected to apply high level of debt financing since it is

considered as profitable at certain level. However, this phenomenon only will take place where the range of market-to-book ratio for a firm is from low to medium. In contrast, the firms with the medium to high market book ratio will choose to apply equity financing. Nonetheless, the equity issuance only will be conducted when the market performance is good, and this concept is proved by market timing. In other words, the high market-to-book ratio firms will still apply debt financing as long as the market performance is not in a good expectation.

All in all, by taking this scenario as an example, we may conclude that the leverage of Malaysian manufacturing firms would not be affected by growth variable in a significant way since their financing methods are more probably to be impacted by the market timing. In other words, the firms may take lower debt whenever they are having high growth opportunities and prefer equity financing instead, however this phenomenon will be subjected to market timing.

5.3 Implications of Study

5.3.1 Companies

The empirical result from current research could contribute a better picture on the relationship between firm specific factors and leverage in the Malaysian manufacturing industry. Thus, based on the outcomes of this research, the manufacturing companies can improve their leverage to a more appropriate level by considering the effects of firm specific factors. Leverage is an indispensable component which affects the firm financial ability in meeting obligations and maximizing returns for shareholders (Boodhoo, 2009). In order to manage leverage in an efficient way, the effect of firm specific determinants should be considered all the time.

By taking one of the examples in the study of Yan (2009), there is a positive relationship between non-debt tax shield and leverage. This can be further supported by the fact which the companies able to enjoy the tax advantage from the depreciation expenses which incurred on tangible assets. In addition, the cash flow of the companies will maintain at high level and their profitability will be further enhanced at the end. Furthermore, the companies with substantial tangible assets investment will be driven to apply debt financing as they are able to provide sufficient collaterals to secure their debts. In other words, the Malaysian manufacturing companies will be benefited from this result which is consistent with our result as well. To be more specifically, the manufacturing companies may continue to engage in heavy machine and equipment investment which they have conducted along the way, and manage the incurred depreciation expenses properly, rather than focusing more in managing interest expenses to further enhance the leverage. Except from this determinant, the empirical results of other firm specific determinants which had been presented in this study also play a role in enhancing the leverage decision of the Malaysian manufacturing companies.

Kremp (1999) states to have advanced econometrics, the companies are required to focus on the dynamics of the leverage decisions, offer better insight on the adjustment process towards the target leverage ratio. The particular study also indicates there is sufficient evidence to support the importance of institutional framework when analysing the determinants of the leverage. Furthermore, in Spain, the firms will adjust their target ratio relatively fast in the case they have a target leverage ratio to refer (De Miguel & Pindado, 2001). By referring to the examples from different studies stated above, we can make a conclusion the leverage decision is important for each of the companies, as they have to be smart to adjust the leverage ratio all the time by constructing an effective financing framework in order to get profit maximization. In other words, the Malaysian manufacturing companies will also be benefited from this study as their decision making can be further improved, especially, financing decisions.

5.3.2 Policy Makers

In this research, the relationship between leverage and profitability, firm size, non-debt tax shield and growth of the Malaysian manufacturing firms are examined and the particular results may be taken into account by policy makers. In addition, the implementation and evaluation of regulations, policies and institutional frameworks in enhancing the firm's earning will be directly reflected according to the results given. Therefore, to improve existing regulations and also re-develop the new policies on leverage area of manufacturing sector, policy makers might take this research as a reference. By applying the leverage related policies, the leverage performance of manufacturing firms can be improved, and their overall financial performance can be enhanced as well, in turn, they may able to contribute to the economy of our country in the form of GDP.

5.3.3 Investors

The profitability of the invested firm is the main concern of investors, thus, by referring to the effect of profitability on leverage in this study, the investors may participate in investing the manufacturing firms whenever they are taking high level of debt, as we found that less money-making firms will have lower debt and vice versa (Cheng and Shiu, 2007).

Other than that, Long and Malitz (1985) hypothesize that financial leverage will have an impact on investment pattern by knowing is there a right time to put in an amount of fund to an investment. To be more specifically, Myers and Majluf (1984) states that underinvestment problem will always be there if the problems of risky debt finance and poor leverage management aroused in a firm, and this will lead it to have insufficient capital. In this case, the firm will only invest to a point that it can repay the promised payment to bondholders. Besides, the maintenance of equipment in a company may lead to potential underinvestment is also considered as the investment

opportunities which need to be correctly identified. In other words, by referring to the results gained in this study, the investors will be able to avoid themselves to invest into a firm with underinvestment problem due to poor debt finance and improper equipment management. Instead, they will conduct their investment in this sector properly.

5.4 Limitations of Study

Incomplete data is one of the limitations in this study. The study is conducted to concern about the impact of firm specific determinants on the listed firm's leverage in the background of Malaysian manufacturing sector between the period from 2003 to 2017. The data obtained in this research is on annual basis. Initially, this research includes all the listed manufacturing companies in Malaysia as sample size, however, problem aroused when some of the data for the listed companies are not completed. Therefore, our research data period is limited within year 2003 to 2017 and 85 listed companies in the manufacturing industry in Malaysia.

Besides, this research is carried out with limited number of independent variables also considered as the limitation of the study. Our research has used four different independent variables which are profitability, growth, non-debt tax shield and firm size. In this research, our study only focuses the effect of these four independent variables towards firm's leverage for the Malaysian manufacturing sector. Therefore, there may have some other variables in the real world which can be used to conduct the leverage related research as different independent variables might generate different outputs.

5.5 Recommendation for Future Researchers

As to help the researchers in the future to conduct a better research on this similar topic, there are some recommendations provided here to cope with the limitations.

Due to the missing data for some of the listed companies, our research does not include all listed manufacturing companies but only taking 85 companies into account, and the time frame is from 2003 to 2017. In future research, the researchers are encouraged to include all the listed companies to enlarge the sample size, so that a more accurate result will be generated. They are also recommended to apply other database that consists of greater availability of data as compared with Bloomberg database. Further, the researchers also can focus their research on different countries such as China and Japan other than Malaysia.

Moreover, extra independent variables that are relevant to the study should be taken into account in the future research to determine their effect on firm's leverage. The reason behind this is our research only limited to four independent variables, therefore, it is recommended to include other related variables such as asset tangibility and liquidity to make the study more comprehensive and meaningful. This is to help the investors and policy makers to make more precise financial decisions.

5.6 Conclusion

The objective of our study is to find out the effect of firm specific determinants towards listed firm's leverage in the background of Malaysian manufacturing sector. A total number of 85 listed companies in manufacturing industry are included in this study from the year of 2003 to 2017. This study demonstrated that significant relationship exists between profitability, firm size, as well as non-debt tax shield on firm leverage. Furthermore, our study provides an insight to the investors, shareholders as well as policy makers to help them in making an accurate decision by understanding the determinants that will contribute significant effect on the firm's leverage. Last but not least, this research also provides several limitations and recommendations for the future researchers in improving the outcome of the research.

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APPENDICES

Appendix 1: Ordinary Least Square Model

Dependent Variable: DA
Method: Panel Least Squares
Date: 03/06/19 Time: 20:36
Sample: 2003 2017
Periods included: 15
Cross-sections included: 85
Total panel (balanced) observations: 1275

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	0.359753	0.000979	367.6148	0.0000
LOGOFSIZE	0.000523	0.004341	0.120486	0.9041
LOGOFNDTS	0.050074	0.009410	5.321377	0.0000
GWTH	-1.23E-05	0.000159	-0.077514	0.9382
C	0.524549	0.042817	12.25101	0.0000
R-squared	0.991742	Mean dependent var		0.440765
Adjusted R-squared	0.991716	S.D. dependent var		2.398699
S.E. of regression	0.218315	Akaike info criterion		-0.201838
Sum squared resid	60.53026	Schwarz criterion		-0.181639
Log likelihood	133.6716	Hannan-Quinn criter.		-0.194252
F-statistic	38132.11	Durbin-Watson stat		0.201853
Prob(F-statistic)	0.000000			

Appendix 2: Fixed Effect Model

Dependent Variable: DA
Method: Panel Least Squares
Date: 03/06/19 Time: 20:58
Sample: 2003 2017
Periods included: 15
Cross-sections included: 85
Total panel (balanced) observations: 1275

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	0.359824	0.000687	523.7905	0.0000
LOGOFSIZE	-0.034936	0.008632	-4.047217	0.0001
LOGOFNDTS	0.043606	0.009408	4.635046	0.0000
GWTH	-9.26E-05	0.000109	-0.852560	0.3941
C	0.693681	0.057257	12.11523	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.996816	Mean dependent var	0.440765
Adjusted R-squared	0.996580	S.D. dependent var	2.398699
S.E. of regression	0.140274	Akaike info criterion	-1.023196
Sum squared resid	23.33654	Schwarz criterion	-0.663657
Log likelihood	741.2875	Hannan-Quinn criter.	-0.888166
F-statistic	4219.893	Durbin-Watson stat	0.508041
Prob(F-statistic)	0.000000		

Appendix 3: Random Effect Model

Dependent Variable: DA
 Method: Panel EGLS (Cross-section random effects)
 Date: 03/06/19 Time: 20:59
 Sample: 2003 2017
 Periods included: 15
 Cross-sections included: 85
 Total panel (balanced) observations: 1275
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	0.359809	0.000682	527.2652	0.0000
LOGOFSIZE	-0.024123	0.007366	-3.274991	0.0011
LOGOFNDTS	0.044723	0.009128	4.899550	0.0000
GWTH	-0.000108	0.000108	-1.003001	0.3161
C	0.639408	0.054855	11.65626	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	0.170206	0.5955
Idiosyncratic random	0.140274	0.4045

Weighted Statistics

R-squared	0.996333	Mean dependent var	0.091737
Adjusted R-squared	0.996322	S.D. dependent var	2.315580
S.E. of regression	0.140437	Sum squared resid	25.04764
F-statistic	86272.15	Durbin-Watson stat	0.474721
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.991522	Mean dependent var	0.440765
Sum squared resid	62.14836	Durbin-Watson stat	0.191327

Appendix 4: Poolability Test

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

Effects Test	Statistic	d.f.	Prob.
Cross-section F	22.502896	(84,1186)	0.0000
Cross-section Chi-square	1215.231616	84	0.0000

Cross-section fixed effects test equation:

Dependent Variable: DA

Method: Panel Least Squares

Date: 03/06/19 Time: 20:58

Sample: 2003 2017

Periods included: 15

Cross-sections included: 85

Total panel (balanced) observations: 1275

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	0.359753	0.000979	367.6148	0.0000
LOGOFSIZE	0.000523	0.004341	0.120486	0.9041
LOGOFNDTS	0.050074	0.009410	5.321377	0.0000
GWTH	-1.23E-05	0.000159	-0.077514	0.9382
C	0.524549	0.042817	12.25101	0.0000

R-squared	0.991742	Mean dependent var	0.440765
Adjusted R-squared	0.991716	S.D. dependent var	2.398699
S.E. of regression	0.218315	Akaike info criterion	-0.201838
Sum squared resid	60.53026	Schwarz criterion	-0.181639
Log likelihood	133.6716	Hannan-Quinn criter.	-0.194252
F-statistic	38132.11	Durbin-Watson stat	0.201853
Prob(F-statistic)	0.000000		

Appendix 5: Breusch-Pagan Lagrange Multiple (BPLM) Test

Lagrange Multiplier Tests for Random Effects

Null hypotheses: No effects

Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided
(all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	3004.240 (0.0000)	2.667810 (0.1024)	3006.908 (0.0000)
Honda	54.81095 (0.0000)	-1.633343 (0.9488)	37.60225 (0.0000)
King-Wu	54.81095 (0.0000)	-1.633343 (0.9488)	19.20441 (0.0000)
Standardized Honda	55.81131 (0.0000)	-1.497144 (0.9328)	32.41039 (0.0000)
Standardized King-Wu	55.81131 (0.0000)	-1.497144 (0.9328)	14.99867 (0.0000)
Gourieroux, et al.*	--	--	3004.240 (0.0000)

Appendix 6: Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.960592	4	0.1380

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
ROA	0.359824	0.359809	0.000000	0.8491
LOGOFSIZE	-0.034936	-0.024123	0.000020	0.0163
LOGOFNDTS	0.043606	0.044723	0.000005	0.6237
GWTH	-0.000093	-0.000108	0.000000	0.1858

Cross-section random effects test equation:

Dependent Variable: DA

Method: Panel Least Squares

Date: 03/06/19 Time: 20:59

Sample: 2003 2017

Periods included: 15

Cross-sections included: 85

Total panel (balanced) observations: 1275

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.693681	0.057257	12.11523	0.0000
ROA	0.359824	0.000687	523.7905	0.0000
LOGOFSIZE	-0.034936	0.008632	-4.047217	0.0001
LOGOFNDTS	0.043606	0.009408	4.635046	0.0000
GWTH	-9.26E-05	0.000109	-0.852560	0.3941

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.996816	Mean dependent var	0.440765
Adjusted R-squared	0.996580	S.D. dependent var	2.398699
S.E. of regression	0.140274	Akaike info criterion	-1.023196
Sum squared resid	23.33654	Schwarz criterion	-0.663657
Log likelihood	741.2875	Hannan-Quinn criter.	-0.888166
F-statistic	4219.893	Durbin-Watson stat	0.508041
Prob(F-statistic)	0.000000		

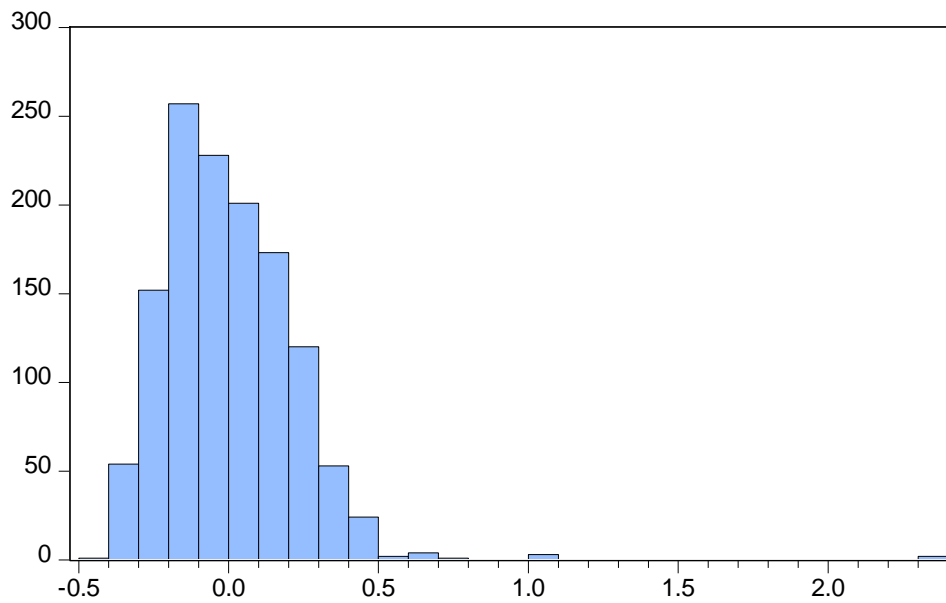
Appendix 7: Descriptive Statistic Table

	DA	ROA	LOGOFSIZE	LOGOFNDTS	GWTH
Mean	0.440765	0.260812	5.405497	-3.601105	9.582449
Median	0.355856	0.066354	5.246498	-3.508705	6.344409
Maximum	85.70968	236.0000	9.917982	4.288690	553.1648
Minimum	0.017748	-1.915680	1.367161	-7.592352	-91.59161
Std. Dev.	2.398699	6.608680	1.414626	0.688658	38.54042
Skewness	35.27394	35.64110	0.677311	0.450525	6.504048
Kurtosis	1254.388	1271.861	3.588481	24.22395	71.14057
Jarque-Bera	83456647	85801566	115.8820	23973.60	255656.0
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	561.9758	332.5359	6892.009	-4591.409	12217.62
Sum Sq. Dev.	7330.283	55641.51	2549.486	604.1939	1892353.
Observations	1275	1275	1275	1275	1275

Appendix 8: Correlation Matrix

	ROA	LOGOFSIZE	LOGOFNDTS	GWTH
ROA	1	-0.0186172...	0.32128466...	0.01749316...
LOGOFSIZE	-0.0186172...	1	0.04966084...	0.06225147...
LOGOFNDTS	0.32128466...	0.04966084...	1	-0.0436845...
GWTH	0.01749316...	0.06225147...	-0.0436845...	1

Appendix 9: Normality Test



Series: Standardized Residuals	
Sample 2003 2017	
Observations 1275	
Mean	-7.40e-16
Median	-0.023663
Maximum	2.332496
Minimum	-0.424981
Std. Dev.	0.220867
Skewness	2.329667
Kurtosis	22.37833
Jarque-Bera	21102.79
Probability	0.000000