

Determinants of Capital Structure in Malaysia Electrical and Electronic Sector

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Abstract—Capital structure is one of the most important financial decisions in corporate financing strategy. It involves the choice of debt and equity level in financing a company's operations. This study aims to investigate whether the capital structure choice of Malaysian electrical and electronic manufacturing companies that are listed in the Bursa Malaysia can be explained by factors that have been found by most studies as dominant determinants of capital structure (company size, profitability, asset tangibility, liquidity and growth). Using debt ratio as the proxy for capital structure and applying pooled ordinary least square multiple regression estimation, the results showed that on average, Malaysian electrical and electronic manufacturing companies used less debt in funding their business operations. The findings also showed that size and asset tangibility has a significant positive relationship with debt level, while liquidity has a negative significant relationship with leverage.

Keywords—Capital structure, capital structure theories, leverage, manufacturing companies.

I. INTRODUCTION

CAPITAL structure of a company is defined as the particular combination of debt, equity and other sources that it uses to fund its business activities. Therefore, making the correct decisions in the level of debt and equity that a company should have at any point of time is very vital for a finance manager. Debt is any long-term liabilities borrowed from financial and non-financial institutions such as accounts payable, bank loans and issuance of bonds. On the other hand, equity refers to stock or any other securities that represent an ownership interest towards a company by the holders.

Capital structure decisions have the underlying purpose towards maximizing the value of a firm. Hence, all of the firms' activities and management's decisions must be directed towards attaining this goal. Any events such as liquidity problems, bankruptcy and financial distress must be given the utmost priority because such events could deviates companies from achieving maximum value objective. However, according to [1], capital structure choices do not affect firm's value under perfect market conditions.

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The key division in capital structure is between debt and equity. The proportion of debt financing is measured by gearing or leverages. Determining the precise combination of debt and equity is not that easy. Firm should establish a target capital structure which it believes is most favourable. And the best or optimal capital structure of a company is when its weighted cost of capital (WACC) is at the lowest.

In the past, much empirical studies in this area have been directed largely towards determinants of companies' capital structure in developed countries. More recent studies have examined companies in developing countries, including Malaysia [2]-[5]. However, most of the studies done on Malaysia scenarios were not looking at the determinants of companies' capital structure in the electrical and electronic manufacturing companies [3], [6].

This study aims to investigate whether the capital structure choice of Malaysian electrical and electronic manufacturing companies that are listed in the Bursa Malaysia can be explained by factors that have been found by most studies as dominant determinants of capital structure (company size, profitability, asset tangibility, liquidity and growth). The interactions will be determined using a pooled ordinary least square multiple regression estimation. Our study will focus on the electrical and electronic manufacturing companies and the study covers the period from 1997 through 2011.

The motivation of this study is to determine the level of impact that manufacturing industry has to the gross domestic product (GDP) of Malaysia. Malaysia GDP is largely contributed by five industries namely services, manufacturing, mining and quarrying, agriculture and construction. And manufacturing industry contributed over 25% of the total Malaysia GDP. Malaysia manufacturing industry is very important because almost half of Malaysian export comes from this industry, especially the electrical and electronic subsector. The electrical and electronic subsector is not only the largest contributor to the manufacturing industry but it also provides one third of employment to the Malaysian. Thus, the specific objective of this study is to ascertain the capital structure choice of Malaysian electrical and electronic manufacturing companies that are listed in the Bursa Malaysia.

The rest of this paper is divided into four sections. The next section contains a brief overview of the literature. Section III discusses the methodology involved, followed by analysis of the findings in Section IV. The paper ends with a conclusion and recommendation in Section V.

II. LITERATURE REVIEWS

A. Theories of Capital Structure

There are different theories of capital structure. Traditional theories started in 1952 by [7] which said that firm can increase its value or lower the cost of capital by using leverage. This theory is called the net income approach. However, in 1963 [8] developed another theory of capital structure that said the value of the firm increase to a certain level of leverage and then tends to remain constant with a moderate use of debt level, and finally value of the firm decreases. This theory holds the concept of optimal capital structure.

Reference [1] was the theorists that established the modern theory of capital back in 1958. Reference [1] looked at capital structure in a very basic world. They assumed perfect capital markets are in existence, where there are no transaction, bankruptcy and agency costs and there are also no taxes. Thus, capital structure and financing decisions affect neither cost of capital nor market value of a firm. Due to the lack of realism in the assumptions, later researchers adjusted the assumptions of the theoretical models as well as introducing new factors that would enable in explaining company's capital structure decisions. The present capital structure theories are namely: trade-off theory, introduced by [9] and pecking order theory, introduced by [10]. Bankruptcy and financial distress costs [11] and agency costs [12] form the basics of trade-off theory.

Trade-off theory proposes that the optimal debt ratio is set by balancing the trade-off between the bankruptcy cost and tax advantage of borrowing. This theory states that there is an advantage to finance with debt. By accumulating debt into a company's capital structure will decrease its corporate tax liability and increases the after-tax cash flow available to the investor. According to the theory, any increase in the level of debt causes an increase in bankruptcy, financial distress and agency costs, and hence decreases firm value. Thus, the optimal capital structure is achieved when the marginal present value of the tax shield on additional debt is equal to the marginal present value of the financial distress and bankruptcy costs on additional debt [9].

An alternative to the trade-off theory is the pecking order theory developed [10]. In pecking order theory the asymmetric information element is included. The theory says that companies prioritize their ways of financing starting with internal funds, followed with debt and lastly new equity. The hierarchy is structured this way because of the transaction costs involved in each of the types of financing. Pecking order theory suggest that management prefers equity financing in favor of debt financing in view of information asymmetry condition and benefit of reduced transactions costs. Based on this theory, highly profitable companies will tend to use internal funding, whereas companies with low profitability tend to use external financing.

B. Measurement for Capital Structure

Capital structure is defined as the combination of debt and equity that company uses to finance its business operation.

Therefore, the key division in capital structure is between debt and equity financing in a company. In general, the proportion of debt financing is measured by gearing or leverages. In the studies of determinants of capital structure, most researchers apply leverage ratio, that is, the total debt to total assets, as a proxy for the capital structure, examples are in [3], [4], [13] and [14]. According to [15] leverage ratio is an indicator that assesses a firm's capital structure. It is quite common for companies to employ both long-term and short-term debt in their financing activities rather than just the long-term debt alone. Therefore, it is appropriate to use leverage ratio or total debt ratio as a proxy of capital structure. The leverage or total debt ratio is defined as total debt divided by total asset.

Even though most researchers in this area of study have used total debt ratio as the proxy for capital structure, there are some researchers that used other ratios for the proxy for capital structure. For example [16] has used three different measurements for capital structure: (1) total debt divided by equity; (2) short term debt divided by equity (3) total long term debt divided by equity. Another study by [15] has used two measurements for capital structure: total debt divided by total asset and total short term debt divided by equity.

C. Determinants of Capital Structure and Empirical Evidences

Several studies investigated the empirical validity of these theories. In these studies, capital structure of firms is related to factors such as company size, profitability, assets tangibility, liquidity and growth opportunities. These factors are briefly explained below.

1. Company Size

Many studies on capital structure, regardless of the industries under study, mentioned that company size is one of the factors that affect the capital structure determination. Logically, larger companies need more financial aids in expanding and improving their operation. Therefore it is possible that larger companies need higher debt as compared to smaller companies. According to trade-off theory, company size is positively correlated with leverage level. This is because company size has inverse relationship to bankruptcy probability which means that the larger the size of a company, the ability to overcome the bankruptcy is high, therefore the bankruptcy risk is low. Besides that, larger company may issue debt at lower cost than smaller companies; hence they are capable to consume more debt. On the other hand, pecking order theory mentioned that firm size and leverage level has negative relationship. It means that the larger the company, the lower the leverage level of the company. This is due to the reason of information asymmetry which is less severe for large firms. Empirical findings on this issue are still mixed. Some studies found positive relationship between company size and debt level, such as [17] and [14] and some found negative relationship as in [18] and [19].

2. Profitability

The trade-off theory indicates positive correlation between profitability and debt ratio. A high-profitability company

would borrow debt from financial institutions to take advantage of the tax shield. It means that interests are a tax-deductible expense which will reduce the amount of taxable income. However, pecking order theory interprets the concept between the profitability and leverage level differently. The theory postulates a negative relationship between profitability and leverage. Firms prefer to use internal funds when available and choose debt over equity when external financing is required. Some examples that studied the relationship between profitability and debt ratio are [17]-[19].

3. Assets Tangibility

Tangible assets such as buildings, machineries and vehicles usually utilized in maximizing the sales revenue meanwhile intangible assets for instance trademarks, contracts and patented technology become a supportive assets that strengthen the position of the company. Besides that, tangible assets are also considered as the measurement of the stability of a company, because in any cash requirement circumstances, the assets can be liquidated and converted into cash. Therefore, a company with fewer tangible assets might have higher risk of bankruptcy. The trade-off theory suggests a positive relationship between the share of tangible assets and debt ratio, since tangible assets can serve as collateral for debt financing. In the pecking-order theory, however, firms that owned more fixed assets have less asymmetrical information. Therefore, the firms tend to depend on equity financing and thus the negative relationship between assets tangibility and debt level. Studies done by [17] and [19] found positive relationship, while [14] found negative relationship between assets tangibility and debt level.

4. Liquidity

Liquidity is an ability to transform assets into cash quickly without affecting the asset's price. Holding liquid assets allows managers to pursue attractive future investment opportunities with internal funding without the need to adjust their basic capital structure. Theoretically, the trade-off theory suggests that companies with higher liquidity ratios should borrow more due to their ability to meet contractual obligations on time. Thus, this theory predicts a positive relationship between liquidity and debt level. On the other hand, the pecking order theory predicts a negative relationship between liquidity and leverage, because a firm with greater liquidities prefers to use internal funds in financing new investments. Few empirical studies have shown consistent results with the pecking order hypothesis such as [20]-[22].

5. Growth Opportunity

The literature is ambiguous about the relationship between growth of firm and leverage. Based on the trade-off theory, company growth opportunity is measured by looking into the intangible assets that the company holds. Company holding future growth opportunities, which are a form of intangible assets, tend to borrow less than company that holding more tangible assets. It is because the intangible assets not only cannot be used as collateral, it also tends to devaluates when financial distress occurs. This theory suggests a negative

relationship between leverage and growth opportunities. Agency theory also predicts a negative relationship with leverage because company with greater growth opportunities has more elasticity to invest sub optimal behaviors, thus, transferring wealth from debt holders to shareholders. In order to restrain these agency conflicts, companies with high growth opportunities should borrow less. Several empirical studies have confirmed the relationship such as [13] and [20].

III. DATA AND METHODOLOGY

Malaysian electrical and electronic (E&E) subsector is classified into manufacturing and distributing operation. There are 48 E&E companies listed in the Bursa Malaysia that involves in manufacturing and distribution of the E&E related products. However, in this study we are only concentrating on the manufacturer of E&E products. Thus, from the 48 E&E companies listed in the Bursa Malaysia, only 32 companies that are considered as manufacturer of E&E products. Our period of study covers from 1997 through 2011. Our sample size is reduced to 11 E&E manufacturers due to the requirement criteria that the companies must be listed in the Bursa Malaysia for 15 years. Our data set comes from the annually balance sheet and income statement of the 11 E&E manufacturing companies listed in the Bursa Malaysia from the year 1997 through 2011. The data were extracted from the OSIRIS database system. All estimation results are derived using Eviews 7.0 software.

In this study, we also employed the debt ratio as a proxy for the capital structure of the E&E manufacturing companies. The debt ratio is defined as the total debt (includes both short-term and long-term liabilities) divided by total assets of the company. This variable measures the share of liabilities in total assets of a company and is widely used in capital structure studies. There are five explanatory variables and are specified as follows:

- company size defined as the natural logarithm of total assets
- profitability defined as earnings before interest and tax (EBIT) divided by total assets
- asset tangibility indicates the existence of tangible assets posses by a firm and defined as total fixed assets and inventories to total assets.
- liquidity is looking at the ability of the current assets to cover current liabilities and defined as current assets divided by current liabilities
- growth opportunities defined as the sales growth over total assets

All the variables are measured using book values because the data employed in this study come from financial statements only.

This study employed the pooled ordinary least squares (OLS) estimations model. The description of the model is:

$$DR_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 LIQ_{it} + \beta_5 GROW_{it} + \varepsilon_{it} \quad (1)$$

where:

- DR_{it} = debt ratio of firm i at time t
- $SIZE_{it}$ = size of firm i at time t
- $PROF_{it}$ = profitability of firm i at time t
- $TANG_{it}$ = asset tangibility of firm i at time t
- LIQ_{it} = current ratio of firm i at time t
- $GROW_{it}$ = growth opportunities of firm i at time t
- ε_{it} = stochastic error term of firm i at time t

IV. EMPIRICAL RESULTS AND ANALYSIS

A. Empirical Results

This section presents the estimation results and discusses the implication of the empirical findings. The descriptive statistics of the dependent and explanatory variables over the sample period are presented in Table I, reflecting the capital structure of the analyzed firms.

TABLE I
 DESCRIPTIVE STATISTICS

| | Debt | Size | Profit | Asset | Liquid | Grow |
|---------|----------|----------|-----------|----------|----------|-----------|
| Mean | 0.421127 | 5.699518 | 0.052426 | 0.491512 | 2.098303 | 0.125819 |
| Median | 0.392526 | 5.432143 | 0.058850 | 0.480074 | 1.310000 | 0.043220 |
| Max | 1.404472 | 7.880131 | 0.910394 | 0.915495 | 11.12000 | 7.656909 |
| Min | 0.034000 | 4.432440 | -1.290280 | 0.052070 | 0.240000 | -0.854005 |
| Std.Dev | 0.235611 | 0.860628 | 0.163131 | 0.219977 | 2.092620 | 0.690278 |
| Skews | 0.552442 | 1.100264 | -3.823049 | 0.211614 | 2.054225 | 8.875653 |
| Kurt | 3.457282 | 3.497242 | 41.16380 | 1.986930 | 6.980230 | 92.09208 |
| J-Bera | 9.830401 | 34.99083 | 10415.20 | 8.287358 | 224.9609 | 56735.99 |
| Prob | 0.007334 | 0.000000 | 0.000000 | 0.015864 | 0.000000 | 0.000000 |
| Sum | 69.48600 | 940.4204 | 8.650315 | 81.09954 | 346.2200 | 20.76011 |
| SSDev. | 9.104081 | 121.4716 | 4.364305 | 7.935972 | 718.1653 | 78.14324 |
| Obs | 165 | 165 | 165 | 165 | 165 | 165 |

On average, the Malaysian E&E manufacturing companies used 42.11% debt financing in funding their business operations. Another 57.89% of their capital structure is being financed by the internal financing. This shows that Malaysian E&E manufacturing sector on average is capitalized by internal financing rather than external financing for the period of 1997-2011.

Most of the Malaysian E&E manufacturing companies in Malaysia are of a medium size company since the mean of company size is 5.6995. As for the earnings before interest and tax of the Malaysian E&E manufacturing companies, on average they are able to make 5.24% return from their total investment.

The asset tangibility, on average, is 49.15% and their current assets are 2 times more than their current liabilities. It proves that they are capable to meet their short-term obligations. And based on the results, the Malaysian E&E manufacturing companies on average are growing at 12% during the study periods.

B. Analysis

The results on the effect of explanatory variables on the debt ratio are presented in Table II below.

TABLE II
 THE EFFECT OF EXPLANATORY VARIABLES ON THE DEBT RATIO

| Variables | Coefficient | Std Error | T-statistics | Prob. |
|-------------------|-------------|-----------|--------------|--------|
| C | 0.039332 | 0.105104 | 0.374217 | 0.7087 |
| Size | 0.056381 | 0.020465 | 2.754987 | 0.0066 |
| Profitability | 0.014191 | 0.083327 | 0.170306 | 0.8650 |
| Asset Tangibility | 0.298194 | 0.081575 | 3.655444 | 0.0003 |
| Liquidity | -0.043274 | 0.007108 | -6.087773 | 0.0000 |
| Growth | 0.031339 | 0.019532 | 1.604478 | 0.1106 |

Notes: R-squared = 0.492700; Adjusted R² = 0.476747; F-statistics = 30.884; Prob. (F-Stat) = 0.000000

According to the empirical findings in Table II, company size is positively related with leverage level and is also

significant in explaining the variation in the debt ratio of the E&E manufacturing companies in Malaysia. This is consistent with the trade-off theory which claims that company size and leverage level has positive relationship. The findings are similar to studies done by [17] and [14]. The positive relationship shows that the larger the size of the company, more financial assistants they need in order to buy another assets to support their operations and thus the need for higher debt. Based on the trade-off theory, the larger the size of the company, the more debt they will have due to the reason that they are less prone to bankruptcy. However, according to pecking order theory, larger company would have less debt because of the existence of information asymmetry which limits the approval of the loan borrowings and thus the negative relationship between company size and debt ratio.

The finding also showed that profitability has positive relationship with debt ratio in the E&E manufacturing companies in Malaysia. The result is consistent with the trade-off theory but does not support the pecking order theory. According to the trade-off theory, high profitability companies are encouraged to have more debt since they can take advantage on the tax benefits from the interest payment obligation which will reduce the taxable income and thus the positive relationship between high profitability and debt level. However, pecking order indicates negative relationship between profitability and leverage level because the more profit a company gained, it will be retained in the company as retain earnings. So company prefers to use the retained earnings (internal funds) first in expanding their business operations and will seek for the external funds if it is needed and in the case of insufficient internal funds. Even though in this study the results showed positive relationship between profitability and leverage level, however, it is insignificant.

In general, a company value is more valuable if they have high tangible assets relative to intangible assets. Asset

tangibility as the factor of capital structure determinants is acceptable in all three capital structure theories namely trade-off theory, pecking order theory and agency cost theory. In this study, the results showed that asset tangibility is significantly positively related to leverage level. This indicates that the more tangible assets possess by a company, the more debt will be consumed by the company. The positive relationship due to the fact that the tangible assets could be pledged as collateral for the loans the company wishes to borrow. Besides that, with the tangible assets pledged as security would also enhance the creditors' confidence level towards the company in meeting the repayment obligation since the liquidation of the assets can be done once the creditors face default risk from the borrowing company. The results supported the findings found in [17] and [19] but opposite from the findings of [14].

Another variable that influences the capital structure decision is the liquidity level of the company. Liquidity is defined as the ability of a company in converting its current assets into cash which then be used in the settlement of the short-term obligations. The empirical results shown in Table II proved that liquidity is significantly affects the capital structure decision of the Malaysian E&E manufacturing companies. However, the results showed a negative relationship with leverage level. The negative relationship is consistent with the pecking order theory which presumes that high liquidity companies should have less debt because they are capable to liquidate their assets into cash immediately in case they need cash urgently. Thus, they prefer to use internal funds in financing their new investment instead of accessing external funds. But according to the trade off theory, high liquidity companies will utilize higher debt because the high liquidation level that the companies possess enable them to convert the assets into cash, thus their capability in making interest payment promptly is high. Examples of some studies in this area are [20], [21] and [22].

In this study, growth is referred as the opportunities of the companies to expand and improve their business operations, through new investment consumptions. The findings of this study showed that growth has a positive relationship with debt level; however, the relationship is found to be insignificant. Trade-off theory claims that leverage level and growth is negatively related. In the trade-off theory, growth indicates the intangible assets that companies hold. Thus, the higher growth of a company means that less debt consumptions because the intangible assets the companies hold could not be pledged as collateral for their borrowings. The opposite is true for the pecking order theory that said that the high growth companies will consume more debt in order to meet new investments opportunities since their internal funds is not sufficient to meet their needs. Our results are similar to the findings of [16], [23] and [24].

V.CONCLUSION

This study attempted to explore the determinants of capital structure of Malaysian E&E manufacturing companies listed on the Bursa Malaysia during the period of 1997 through

2011. The investigation is performed using the pooled OLS estimation. This study has used the debt ratio, that is a measure of leverage, as an explained variable, while company size, profitability, assets tangibility, liquidity and growth opportunities as the explanatory variables.

According to the empirical analysis results, company size, profitability, assets tangibility and growth opportunities have positive relationship with debt ratio, while liquidity has negative relationship. The positive relationship in company size, profitability and assets tangibility are consistent with the trade-off theory rather than the pecking order theory. On the other hand, the negative relationship in liquidity and positive relationship in growth opportunities is consistent with pecking order theory and contradicts the trade-off theory.

In terms of significant variables, the empirical findings showed that company size, assets tangibility and liquidity are found to have significant relationship with debt level.

Profitability and growth opportunities are found to be insignificant determinants of the debt ratio in the E&E manufacturing companies in Malaysia. In conclusion, the evidence suggests that company size, assets tangibility and liquidity are the contributing factors in determining the capital structure of the E&E manufacturing companies in Malaysia.

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