

Determinants of Capital Structure of Industrial Product Sector in Malaysia

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ABSTRACT

This study was conducted to identify the most significant independent variable towards dependent variable. It also to investigate the relationship between explanatory variables and main variable, as well as to investigate which capital structure theories that Malaysia's industrial product sector are consistent with. The dependent variable of this study is debt ratio, while there are four independent variables which are liquidity, tangibility, the size of the firm and profitability. All data were collected from Osiris (Bureau Van Dijk website). The data are from 106 companies' annual report which had been extracted for 10 years, which is from the year 2003 to the year 2012. All data had been recorded based on a yearly basis. The data were analyzed by using STATA10 through Panel Data analysis. This study was being tested by using Ordinary Least Square Regression (OLS), Random Effect Generalized Least Square Regression (GLS), Random Effect (Breusch Pagan Test) and Fixed Effect (Hausman Fixed Test). The finding reveals that liquidity, the size of the firm and profitability are significant with debt ratio. In the meantime, positive relationships exist between tangibility and firm size toward debt ratio, while liquidity and profitability have negative relations with the dependent variable. Based on the relationships between independent variables and a dependent variable, it has been found out that Malaysia's industrial product sector is consistent with trade-off theory and pecking order theory.

KEYWORDS: Debt Ratio, Liquidity, Tangibility, Size of Firm, Profitability.

INTRODUCTION

The capital structure is a combination of long-term debt, specific short-term debt, common equity and preferred equity of a firm. Capital structure shows how a company finances its overall operations and growth by using different sources of funds. Debt includes bonds, long-term notes payable and commercial paper. Meanwhile, equity can be defined as security or stock which represents an ownership interest. Equity consists of retained earnings, common stocks and preferred stocks. In analysing capital structure, the proportion of long-term debt and short-term debt of a company is considered. In [9] explained that most of the theories of capital structure in modern world follow the work of [10]. The capital structure is very crucial, particularly for companies in the industrial product sector as it has an impact on firm's valuation, capital budgeting decisions and long term corporate profits. The capital structure of a company can be influenced by a lot of factors such as firm size, industry type and ownership control [2].

During the late 20th century, Malaysia is known as a newly industrialized country that experienced an economic boom. Besides, Malaysia also underwent rapid development at that time. As a result, Malaysia was known as the world's largest producer of palm oil, rubber, and tin prior to this rapid industrialization. The Malaysian government was forced to diversify and modernized the economy when the tin market collapsed in the early 1980's. Malaysia is at 7.5%, held the 37th highest industrial production growth rate in the world. The key industries of Malaysia are divided into two areas, which are Peninsular and East Malaysia. In Peninsular Malaysia, the key industries include timber processing, tin mining and smelting, logging, electronics, light manufacturing, medical technology, rubber and palm oil. Meanwhile, for the Eastern Malaysia states of Sabah and Sarawak, the key industries are more focused on agriculture processing, logging, refining and petroleum producing.

Through this study, it is interested to find out the factors that affect the capital structure of Malaysia's industrial product sector. Although this sector is growing in Malaysia, it is still under explored. This is where many researches on industrial product sector had been done previously but not on the capital structure. Besides that, there were also a lot of researchers had studied about capital structure but not on the industrial product sector. Therefore, it is still currently unclear. That is why the researcher would like to find out more on this topic.

LITERATURE REVIEW

Debt Ratio (DR)

The debt ratio is a financial ratio that is used to measure the extent of a firm's leverage or consumer debt. As the ratio goes higher, this indicates the more leveraged the company is and the greater its financial risk. In [13] reported that in making decisions for a firm's capital structure, it must relate to the relative amounts of equity and debt that should be used. They further stated that before making investment decisions, the debt's level in a company's capital structure should be considered by investors. Meanwhile, debt financing accords increased efficiency plus it also offers cost leaders the benefit of tax advantage [6]. This occurs due to constraints imposed by the debt holders. Additionally, positive effect on the performance of a firm can be seen through the maximum use of debt. The maximum debt in the capital structure should be utilized by firms because of tax deductible interest payments [10].

Liquidity

One of the determinants of capital structure is liquidity. In [4] stated that the liquidity of properties represents the cost of financial distress. In [11] suggests that liquidity and leverage should increase together, which means that these two variables are significant to each other. This is due to the fact that firms with higher liquidity ratios might have higher debt ratios. This occurs as a result of greater ability of the firms to meet their short term obligations. Besides, liquidity and debt ratio were found to be significant and has a negative relationship with each other [8]. They explained that less debt tends to be used by companies with high liquidity. This shows that firms with high liquidity usually finance their activities by following "pecking order" theory. They are able to generate more cash and use excess cash inflow to finance their investment activities and operations.

Tangibility

The tangibility of assets is measured as fixed assets over total assets. According to [3], one of the crucial factors in determining a firm's capital structure is the asset structure of a firm. A company with a lot of total assets will have more collateral to support higher debt level [12]. They also found that there is a significant relationship between asset tangibility and debt. Conversely, in [5] reported that there is an insignificant relationship between these two variables. Meanwhile, according to trade-off theory, there is a significant relationship between the share of fixed assets (tangibility) and debt ratio [7]. This occurs as the collateral for debt financing is served by fixed assets. However, by applying pecking order theory, when maturity is considered, it proposes that tangibility is significant to long term debt financing. Conversely, it is insignificant towards short term debt financing.

Size of Firm

Literature usually defines size of the firm to be one of the determinants of a firm's capital structure. In [1] revealed that the firm value and capital structure are not closely related to each other. However, based on trade-off theory, positive relationship exists between firm size and debt ratio [7]. This is due to better diversification in larger firms and a lower probability of experiencing financial distress. In [3] stated that as larger firms are more diversified with stable cash flow, they tend to have less risk than smaller firms. Conversely, based on pecking order theory, there is negative relationship between firm size and debt ratio. This is where information asymmetrical is not a big issue in large companies. It is based on information asymmetry between insiders at a company and outsiders in capital markets in order to reveal the effect of firm size brings towards capital structure.

Profitability

As implied by the trade-off theory, profitability and debt level has a positive relationship towards each other [7]. This is due to the situation where there is a high level of borrowing capacity that caused by high profitability level, which then will encourage the tax-shield usage. In contrast, according to the pecking order theory, there is an insignificant relationship between profitability and debt level. This occurs as a result of the situation where low-profit companies will be outperformed by high-profit companies when retained earnings are used in internal financing. Firms that generate high earnings will have lower debt levels [3]. This means that there is an insignificant relationship between profitability and debt ratio.

METHODOLOGY

Method of Data Collection

All data from this research study were collected from secondary sources. The researcher uses secondary data collection method to gather as much data as possible from companies' annual reports that are available in Osiris from Universiti Teknologi MARA (UiTM) Terengganu's library.

Data Analysis

The analysis was made based on the availability of the data from 106 companies in the industrial product sector from the period of 2003 to 2012, which is for 10 years. It uses a STATA10 program (Static Panel Data Process) to analyze all of the data in order to obtain the best result.

Descriptive Statistics

Descriptive statistics are used to describe the basic features of the data in the study. It contains of mean, maximum, minimum, variance, coefficient of variance and standard deviation. It is a set of brief descriptive coefficients, which summarizes a given data set.

Correlation between Independent Variables

A broad class of statistical relationships is referred as correlation. Correlation can also be referred to any withdrawal of two or more random variables from independence. Thus, the implementation of Pearson Correlation test helps the researcher to identify the relationship appears between all the selected variables. Pearson Correlation test is sensitive only to a linear relationship between two variables.

Regression Analysis

Regression analysis is a statistical technique regression for the investigation of the relationship between variables in a study. Regression analysis involves searching for the best straight line relationship in order to explain the variation in a dependent variable (Y), which depends on the variation in independent variable (X). The statistical tool uses in this study is Multiple Linear Regression analysis. It is an analysis done to identify the simultaneous effects of several independent variables on a dependent variable that is interval scale.

Pooled Ordinary Least Square (POLS)

The analysis starts with Ordinary Least Square (OLS) regression where the data then will be pooled together and assuming that the coefficients are the same for all individuals. POLS is the basic approach used in estimating the panel data. It is employed in this study to examine the simultaneous effects of several independent variables (X) on the dependent variable (Y). Multicollinearity is a condition where the predictor is highly correlated with each other. Multicollinearity problem exists if variance inflation factor (VIF) is more than 5 or the correlation is more than 0.8. If the problem does exist, it can be solved by conducting Pooled Generalized Least Squares (PGLS). Heteroscedasticity indicates the error terms that have different variances. Heteroscedasticity problem can be identified by conducting the Breusch and Pagan Test/Cook-Weisberg Test. The problem can be solved by conducting the PGLS.

Panel Data Analysis

In panel data analysis, it is used to measure one or more variables on one or more subjects repeatedly (repeated cross-sectional time-series). Panel-Random Effect Model (REM) is a popular tool used to estimate the panel data models. Under the null hypothesis, correlation should not exist between both individual effects and explanatory variables. In order to decide whether to proceed with REM or not, the researcher needs to run the Breusch and Pagan test. In order to choose either to use POLS or Panel data analysis, Breusch and Pagan test will be conducted. The result will be expressed through the Prob> chi2. If the result is significant at 0.000 or below than 0.005, the researcher will reject H0 and H1 will be accepted. The Hausman Fixed test will then be conducted as the panel data has been chosen. In Fixed Effect Model (FEM), it reports the individual-specific effect is a random variable and it is allowed to be correlated with explanatory (independent) variables. In order to decide which model is being used, the Hausman Fixed test will be conducted. This test is imposed in comparing the analysis of REM and FEM. Then, Hausman Fixed test will be conducted to compare the analysis between Random Effect Model and Fixed Effect Model. The selection of the model will be determined through the result of Prob> chi2. H0 will be rejected if the result is significant at 0.0000 or below 0.05, which then will lead to the acceptance of H1. If H0 is rejected, the

analysis of data will be continued with Fixed Effect Model Two-Way Estimation in which year is going to be tested as variable.

Theoretical Framework

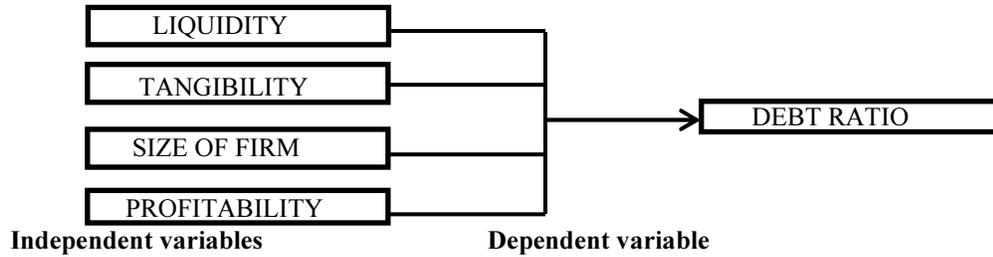


Figure 1: Theoretical framework

Figure 1 shows the theoretical framework diagram for determinants of capital structure for industrial product sector in Malaysia. The elements of this research study are liquidity, tangibility, size of firm and profitability. According to the diagram, change in the independent variables which consist of liquidity, tangibility, the size of the firm and profitability will affect the dependent variable which is debt ratio. Estimation equation is shown in below:

$$DR_{i,t} = \alpha + \beta LIQ_{i,t} + \beta TANG_{i,t} + \beta SIZE_{i,t} + \beta PROF_{i,t} + \sum_{i,t} \quad (1)$$

where $DR_{i,t}$ = Dependent variable which presented by debt ratio, α = The constant number of equation, β = Coefficient beta value, $LIQ_{i,t}$ = Independent variable which presented by liquidity, $TANG_{i,t}$ = Independent variable which presented by tangibility of assets, $SIZE_{i,t}$ = Independent variable which presented by size of firm, $PROF_{i,t}$ = Independent variable which presented by profitability and $\sum_{i,t}$ = The error term.

Hypotheses

The hypotheses that are going to be tested in this study are as follows.

Hypothesis 1

- H0: There is an insignificant relationship between debt ratio and liquidity.
- H1: There is a significant relationship between debt ratio and liquidity.

Hypothesis 2

- H0: There is an insignificant relationship between debt ratio and tangibility.
- H1: There is a significant relationship between debt ratio and tangibility.

Hypothesis 3

- H0: There is an insignificant relationship between debt ratio and size of firm.
- H1: There is a significant relationship between debt ratio and size of firm.

Hypothesis 4

- H0: There is an insignificant relationship between debt ratio and profitability.
- H1: There is a significant relationship between debt ratio and profitability.

FINDINGS AND DISCUSSION

R-sq: overall= 0.3230

F(4, 950) = 62.77
 Prob> F = 0.0000

Table 1: Fixed Effect Two-Way estimation

ldebratio	Coef.	Std. Err.	t	P>(t)	95% Conf.	Interval
lliquidity	-0.7944638	0.0582823	-13.63	0.000	-0.9088851	-0.6800424
ltangibility	0.1405285	0.0957289	1.47	0.143	-0.0474092	0.3284662
Lsizeoffirm	0.2799793	0.0609883	4.59	0.000	0.1602453	0.3997132
lprofitability	-0.0603327	0.0218674	-2.76	0.006	-0.1032634	-0.017402
Year	-0.0339672	0.007775	-4.37	0.000	-0.0492313	-0.0187032
_Cons	64.04064	15.11536	4.24	0.000	34.36575	93.71554

Notes: The summary statistics are based on the 837 firm-year observations. The dependent variable is debt ratio (DR). The explanatory variables are defined as follows: liquidity (LIQ), tangibility (TANG), size of firm (SIZE) and profitability (PROF). (Ln) Log transformation has been specified for these variables.

According to Table 1, only 32.30% of the variation debt ratio can be explained by liquidity, tangibility, firm size and profitability as shown by the value of overall R-squared. This has left 67.70% of the variation of the dependent variable to be explained by other independent variables that are not included in this model for example Gross Domestic Product (GDP), tax and firm’s growth. Liquidity has found to be significant at the 1% level and 1% increase in liquidity will result in the decrease of debt ratio as much as 79.45%. In the meantime, tangibility is not significant towards debt ratio as its p-value is 0.143. This is in line with pecking order theory as when maturity is considered, it proposes that tangibility is significant to long term debt financing. Conversely, it is insignificant towards short term debt financing [18]. Then, for size of firm, it is significant at the 1% level and its relationship with debt ratio is positive. As firm size increase by 1%, debt ratio will increase as well as much as 28.0%. As similar to tangibility, the size of the firm also consistent with trade-off theory as it possesses positive relation with debt ratio. Besides that, as similar to liquidity and firm size, profitability is significant at the 1% level as well. About 1% increase in profitability will result in a 6.03% decrease in debt ratios. The insignificant relationship however is opposite to trade off theory. This indicates that the negative relationship is consistent with pecking order theory.

CONCLUSION AND RECOMMENDATIONS

Based on the result obtained from Fixed Effect Two-Way Estimation in Table 1, the most significant independent variables are liquidity, size of firm and profitability. All of the mentioned explanatory variables are significant at the 1% level, which also means that they have the confidence level at 99%. This answers the first objective of this study. Furthermore, it has been found out that tangibility and firm size have positive relationships with a debt ratio in which the coefficient of tangibility is 0.1405285 and size of firm is 0.2799793. Meanwhile, liquidity and profitability show a negative relationship towards dependent variable with the coefficient of -0.7944638 and -0.0603327 respectively. Thus, the second objective is achieved. Meanwhile, from the result obtained from this study, Malaysia’s industrial product sector is consistent with both trade off and pecking order theories. The positive relationship between tangibility and the debt ratio is in line with trade-off theory as well pecking order theory. In the meantime, firm size which has a positive relationship towards debt ratio is consistent with trade-off theory while pecking order theory suggests the negative relationship that exists between profitability and debt ratio. Thus, the third objective is fulfilled. Therefore, it can be concluded that the researcher achieved all of the objectives.

In order to achieve better result in the future for this study, it is recommended for future researchers to enlarge the scope of the study by adding the number of companies and sample of years which are more than 10 years. It is also advised to collect the data from registered companies as data obtained from this type of companies are more reliable and has high validity. The list of registered companies can be gained through Bursa Malaysia.

Apart from that, it is suggested to add other independent variables for instance taxation, research and design (R&D), inflation and GDP. All of these variables may help in achieving better result as they play an important role towards our industrial product sector. Additionally, the industrial product sector is the biggest contributor to Malaysia’s GDP. Thus, this sector is very crucial to the development of Malaysia’s economic growth.

In addition, future researchers can also extend the scope of this study by gathering data from other countries instead of Malaysia alone. The scope of future study can be enlarged by collecting data from Asia countries such as China, India, Thailand and Vietnam. Therefore, it is hoped that these recommendations may help future researchers to achieve better and more satisfying result regarding to this topic.

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