

The Determinants of Capital Structure for The Coal-Mining Companies Listed on Indonesia Stock Exchange

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Submitted: June 2022, Revised: November 2022, Accepted: February 2023

ABSTRACT

The purpose of this research is to explain the effect of profitability, asset structure, growth opportunities, and non-debt tax shields on the capital structure of the coal-mining firms indexed on the Indonesia Stock Exchange from 2016 to 2020. There are 12 company samples in this research, which was determined with the purposive sampling method. The series of tests that will be carried out in this study include descriptive statistical analysis, panel data regression model tests, classical assumption tests, multiple linear regression analysis, and hypothesis testing. The data are processed using the EViews 12 software. The outcomes of this study show that profitability (ROA) and non-debt tax shields (NDTS) are affecting the capital structure (DER) negatively and significantly, growth opportunities (MTB) is affecting the capital structure (DER) positively and significantly, while asset structure (TANG) does not affect the capital structure significantly.

Keywords: *Capital Structure, Profitability, Asset Structure, Growth Opportunities, Non-debt Tax Shields*

1. INTRODUCTION

The fourth industrial revolution has taken place all over the world, including Indonesia. In 2018 the President of the Republic of Indonesia, Joko Widodo, has set 10 national priority steps, namely the Making Indonesia 4.0 roadmap to accelerate the transformation towards Industry 4.0 [1]. In the attempt to realize the Making Indonesia 4.0 initiatives, support from the mining industry sector as the energy provider would certainly be required [2]. In the fulfilment of electrical energy, Indonesia still depends on the steam power plant which uses coal as the fuel [3]. In addition to that, coal companies also play a big role in fulfilling the global demand for coal through export activities [4].

Since the financial function plays a vital part in a company's operations, financial managers need to make careful and thoughtful decisions, including decisions related to the company's sources of funding. Companies can raise funds through equity or liability. The combination of sources of funding used by a company is known as the capital structure [5]. Determining the ideal capital structure can lower a company's cost of capital, therefore the company's value can be increased [6].

Many economic theories have attempted to explain ways to develop an ideal capital structure that can maximize a firm's value. However, this is still a challenge for the management because there is no definite formula that can determine the optimal proportion of funding sources [6]. Many factors may determine the capital structure of a company, including profitability, asset structure, growth opportunities, and non-debt tax shields. Previous studies that examined the effect of these various factors on capital structure showed different results, therefore, this topic needs to be investigated further because the previous authors that have been researching this topic couldn't agree.

According to the background of the problems that have been described, the purpose of this study is to gather empirical evidence regarding the effect of profitability, asset structure, growth

opportunities, and non-debt tax shields towards the capital structure of the coal-mining firms indexed on the Indonesia Stock Exchange from 2016 to 2020.

2. THEORETICAL REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Trade-off Theory

Trade-off theory is based on the trade-off between the pros and cons of the usage of debt, in this case, the company's assets and investment plans are held constant [7]. This theory states that a company has a certain target level of debt and acquires debt to the stage where the limits of tax shields from added debt are balanced by the present value of costs incurred in the event of financial distress [8]. Financial distress refers to a condition in which a company experiences financial difficulties, loss of business operations, impairment of equity, inability to pay its obligations and capital costs, or legal action due to non-payment of the debts [9].

2.2. Pecking-Order Theory

In 1984, Myers and Majluf came up with the pecking order theory [7]. This theory states that companies prefer internal funding over external funding, internal funding is obtained from the company's operation activities [10]. When internal funding sources are insufficient and the company is forced to use external funding, the management will issue debt before issuing shares. In brief, the pecking order sequence is internal funds, debt, and shares. Based on this theory, the company does not have a definite target debt ratio, this is because equity can be obtained both internally and externally [7].

2.3. Signalling Theory

Signaling theory is based on the information asymmetry between the management and shareholders [11]. Management is believed to have more information about the company's financial position than shareholders. This approach explains that the company's capital structure gives a signal to investors about the company's cash flow [12]. Companies with positive cashflows and bright prospects will prefer to obtain funding through debt, while companies with poor prospects will prefer to obtain funding through the issuance of new shares [11].

2.4. The Effect of Profitability towards Capital Structure

Profitability is affecting capital structure negatively and significantly. According to Handoo and Sharma [13], profitability is a financial surplus obtained when the total income from a company's business activities exceeds the costs incurred to carry out these business activities. The higher the profit of a company, the more profitable it is. According to the pecking order approach, a company uses internal funds before issuing debt or new shares to raise funds. Dewiningrat and Mustanda [14], and Sheikh and wang [15] found a negative and significant relationship between profitability and capital structure, while Leviani and Widjaja [16] found that profitability had no significant effect on capital structure.

H₁: Profitability is affecting the capital structure negatively and significantly.

2.5. The Effect of Asset Structure towards Capital Structure

Asset structure is affecting the capital structure positively and significantly. According to Nugroho and Yuyetta [17], the asset structure ratio reflects the number of fixed assets a company has in hand compared to the total assets. Fixed assets can be utilized as collateral for debt financing therefore debt is more accessible to companies with a large number of fixed assets. This is backed by the trade-off approach which explains that firms with big asset structure ratios will increase their debt ratio targets. Fueno and Widjaja [18] found that asset structure doesn't affect capital structure

significantly. However, Sheikh and Wang [15] found that asset structure has a negative and significant effect on capital structure, while Viviani [19] found that asset structure is affecting capital structure positively and significantly.

H₂: Asset structure is affecting the capital structure positively and significantly

2.6. The Effect of Growth Opportunities towards Capital Structure

Growth opportunities are affecting capital structure positively and significantly. According to Titman and Wessels [20], growth opportunities are intangible assets that can increase a firm's value. Companies with high growth opportunities have a greater capacity to carry out expansion projects, new product launches, company acquisitions, and assets replacement [21]. To support its rapid growth, the company will need a large number of funds. Referring to the signaling theory, companies with a high level of growth opportunities will prefer to obtain financing through debt rather than funding through the issuance of shares to avoid the emergence of negative signals due to information asymmetry. Sheikh and Wang [15] found that growth opportunities do not affect capital structure significantly, while Saif-Alyousfi et al. [22] found that growth opportunities are affecting capital structure negatively and significantly. However, Chen [21] found that growth opportunities are affecting capital structure positively and significantly.

H₃: Growth opportunities are affecting the capital structure positively and significantly.

2.7. The Effect of Non-debt Tax Shields on Capital Structure

Non-debt tax shields are affecting the capital structure negatively and significantly. According to Huang and Song [23], non-debt tax shields is tax deduction obtained from depreciation and amortization. Trade-off theory emphasizes the offset between the pros and cons of the usage of debt. The existence of non-debt tax shields reduces the perks of using debt, therefore the incentives from the use of debt become less attractive to companies. Viviani [19] found that non-debt tax shields are affecting the capital structure negatively and significantly, while Saif-Alyousfi et al. [22], and Huang & Song (2005) found a positive and significant correlation between non-debt tax shields and capital structure.

H₄: Non-debt tax shields are affecting the capital structure negatively and significantly.

3. RESEARCH METHODOLOGY

This study uses a causal research design. The subject was all coal-mining firms indexed on the Indonesia Stock Exchange from 2016 to 2020. This study uses the purposive sampling method. The sample criteria applied are 1) Coal-mining firms that are indexed on the Indonesia Stock Exchange from 2016 to 2020, 2) Coal-mining firms that are indexed on the Indonesia Stock Exchange that have issued annual financial reports for the period of 2016-2020, 3) Coal-mining firms with financial reports ending on December 31, 4) Coal-mining companies that have never experienced losses from 2016 to 2020. From the total population of 26 companies, 12 companies met the sample criteria. The data utilized in this research were sourced from the company's annual financial reports which were obtained from the company's official website and the official website of the Indonesia Stock Exchange (idx.co.id), as well as daily stock prices obtained from the Yahoo Finance website (yahoo.finance.com). The data were analyzed by using the random effect regression model and processed with the help of EViews 12 software.

The object studied in this research consists of four independent variables and one dependent variable. profitability, asset structure, growth opportunities, and non-debt tax shields are the independent variables in this study, whereas capital structure is the dependent variable. Table 1 shows the measurements used to assess each variable in this study.

Table 1 Measurements of the Variables

Variables	Measures
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Capital Structure	$DER = \frac{Total\ Debt}{Total\ Equity}$
Profitability	$ROA = \frac{EBIT}{Total\ Assets}$
Asset Structure	$TANG = \frac{Fixed\ Asset}{Total\ Assets}$
Growth Opportunities	$MTB = \frac{Market\ Value/Share}{Book\ Value/Share}$
Non-debt Tax Shields	$NDTS = \frac{Depreciation}{Total\ Assets}$

4. FINDINGS AND DISCUSSIONS

4.1. Descriptive Statistics Analysis

The output of the descriptive statistical analysis performed shows that the average rate of the capital structure variable (DER) is 0.6784, the standard deviation rate is 0.506358, the mid-rate is 0, 5869, the highest rate is 3.3831, and the lowest rate is 0.0965. The profitability variable (ROA) has an average rate of 0.1832, a standard deviation rate of 0.126881, a mid-rate of 0.1530, the highest rate is 0.6062, and the lowest rate is 0.0191. The asset structure variable (TANG) has an average rate of 0.2264, a standard deviation rate of 0.0889, a mid-rate of 0.2189, the highest rate is 0.4463, and the lowest rate is 0.0416. The growth opportunities variable (MTB) has an average rate of 1.9172, a standard deviation rate of 1.5869, a mid-rate of 1.5676, the highest rate is 7.9114, and the lowest rate is 0.2880. The non-debt tax shields variable (NDTS) has an average rate of 0.0546, a standard deviation rate of 0.0325, a mid-rate of 0.0497, the highest rate is 0.1749, and the lowest rate is 0.0137.

4.2. Panel Data Regression Model Test

The Chow test was carried out to test which between the fixed effect model (FEM) and the common effect model (CEM) was best. The cross-section Chi-square probability is 0,0000 since the value is below the level of significance at 5%, it shows that the proper model is the FEM. Then, the Hausman test was performed to test which between the fixed effect model (FEM) and the random effect model (REM) was best. The cross-section random probability is 0,9523, since the value is above the level of significance at 5%, it shows that the proper model is the REM. Due to the inconsistency of the results of the tests, the Lagrange multiplier test was carried out to test whether the FEM or the CEM was best. Both Breusch-Pagan value is 0,0000, since the value is below the level of significance at 5%, it shows that the proper model is the REM.

4.3. Classical Assumption Test

The normality test was performed to find out if the data that have been gathered are normally distributed. According to the normality test results that are shown in Picture 2, the probability value is 0,411905. Since the value is above the level of significance at 5%, from this it can be stipulated that the data used in this research are normally distributed.

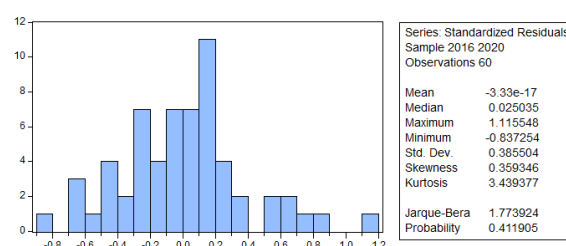


Figure 1 The Result of Normality Test

The multicollinearity test was used to see if there were any correlations between the model's independent variables. From the results shown in Table 2, all of the correlation coefficients do not exceed 0,9. Therefore, it can be concluded that there is no multicollinearity in this model.

Table 2 Multicollinearity Test Results

	ROA	TANG	MTB	NDTS
ROA	1	-0.05586	0.51333	-0.2105
TANG	-0.05586	1	-0.06958	0.27739
MTB	0.51333	-0.06958	1	-0.16313
NDTS	-0.2105	0.27739	-0.16313	1

4.4. Multiple Linear Regression Analysis

The regression model employed in this research is the random effect model (REM). The classical assumption tests that have been performed previously show that the regression model was able to fulfil the classical assumptions. To determine how the independent variables are partially affecting dependent variables, the multiple linear regression analysis was performed, the results are presented in Table 3.

Table 3 The Result of Multiple Linear Regression Test

Dependent Variable: DER				
Method: Panel EGLS (Cross-section random effects)				
Sample: 2016 2020				
Periods included: 5				
Cross-sections included: 12				
Total panel (balanced) observations: 60				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.890642	0.257972	3.45247	0.0011
ROA	-2.2022	0.471369	-4.67194	0.0000
TANG	0.026939	0.835689	0.032235	0.9744
MTB	0.231053	0.052329	4.415394	0.0000
NDTS	-4.72495	2.059122	-2.29464	0.0256
Weighted Statistics				
R-squared			0.399677	
Adjusted R-squared			0.356017	
S.E. of regression			0.298769	
F-statistic			9.154318	
Prob(F-statistic)			0.000010	

From the multiple linear regression results shown in Table 3, the equation used in this study is explained below:

$$DER_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 TANG_{it} + \beta_3 MTB_{it} + \beta_4 NDTS_{it} + e_{it}$$

Table 3 shows that ROA has a t-statistic rate of -4.67194 and a probability rate of 0.0000. The regression coefficient of the ROA variable is -2.2022. This indicates ROA is affecting DER negatively and significantly, therefore H_1 in this study is accepted. TANG has an at-Statistic rate of 0.032235 and a probability rate of 0.9744. This indicates TANG does not affect DER significantly, therefore H_2 in this study is rejected. MTB has a t-statistic rate of 4.415394 and a probability rate of 0.0000. The regression coefficient of the MTB variable is 0.231053. This indicates MTB is affecting

DER positively and significantly, therefore H_3 in this study is accepted. NDTS has an at-Statistic value of -2.29464 and a probability value of 0.0256. The regression coefficient of the NDTS variable is -4.72495. This indicates NDTS is affecting DER negatively and significantly, therefore H_4 in this study is accepted.

The adjusted R-squared rate for the regression model used in this study is 0.356017. This indicates that 35.60% of the dependent variable, which is the capital structure (DER) is explained by profitability (ROA), asset structure (TANG), growth opportunities (MTB), and non-debt tax shields (NDTS). The remaining 64.40% is explained by other variables that are not tested in this study.

The profitability variable in this research was evaluated by the ROA (return on assets) ratio. It was found that profitability is affecting the capital structure negatively and significantly. This finding matched the pecking order approach, which states that firms prefer to use internal financing to external financing. Firms with a high level of profitability generally have more retained earnings as the source of internal funds, so the company will borrow less. This aims to lower the use of debt and minimize the risk of bankruptcy. This finding is confirmed by the research results of Dewiningrat and Mustanda [14], Sheikh and Wang [15], Saif-Alyousfi et al. [22], and Chen [21] who also found that asset structure is affecting the capital structure negatively and significantly in their research.

The asset structure variable in this study was evaluated by TANG (tangibility) ratio. It was found that the asset structure is affecting the capital structure positively but not significantly. As stated in the trade-off theory, asset structure and capital structure are related positively because fixed assets can be utilized as debt collateral, therefore companies with a high level of asset structure can acquire more debt. However, the relationship between these two variables is not significant. The reason being the asset structure variable is not the main consideration that affects the company's capital structure decisions. Coal-mining companies invest heavily in other assets such as mining property assets, exploration and evaluation assets, and other non-current assets which are expected to generate maximum returns in the future. The finding of an insignificant relationship between asset structure and capital structure matched with the research results of Fueno and Widjaja [18], and Nugroho and Yuyetta [17].

The growth opportunities variable in this study was evaluated by the MTB (market-to-book) ratio, it was found that growth opportunities are positively and significantly affecting the capital structure. Companies with high growth opportunities have a greater capacity to undertake new projects, thus requiring large costs to support such growth. According to signaling theory, companies with high growth opportunities prefer to use financing through debt rather than issuing new shares to avoid the emergence of negative signals that can lower stock prices. This finding matched with the results of Panda and Nanda's [24] research which found a positive relationship between growth opportunities and capital structure in construction, machinery, and iron sector companies. In addition, Chen [21] also found similar results in manufacturing companies.

The non-debt tax shields variable in this study was evaluated by NDTS (non-debt tax shields) ratio, it was found that non-debt tax shields are affecting the capital structure negatively and significantly. Referring to the trade-off theory, companies will use debt financing until there is a balance between the benefits derived from tax shields on debt and bankruptcy costs. However, because non-debt tax shields serving as depreciation and amortization charges exist, debt incentives are becoming less appealing to businesses. This finding is confirmed by the research results of Gómez et al. [25], Huang & Song [23], Panda and Nanda [24], and Wulandari [26].

5. CONCLUSIONS & IMPLICATIONS

According to the data analysis, the outcome of this research found that profitability (ROA) and non-debt tax shields (NDTS) are affecting the capital structure (DER) negatively and significantly, growth opportunities (MTB) have is affecting the capital structure (DER) positively and significantly, while asset structure (TANG) does not affect the capital structure (DER) significantly.

The findings of this study have several implications and contributions for practitioners and academicians. The practitioners who might benefit from this study are the firm managers and investors. Firm managers should identify their profitability, growth opportunities, and non-debt tax

shields to optimize their capital structure. Investors should take these factors that affect capital structure into consideration before deciding to invest in a particular company. For academicians, this study contributes to adding deeper insights into the capital structure, particularly for the coal-mining industry in Indonesia.

6. LIMITATIONS & RECOMMENDATIONS FOR FUTURE RESEARCH

Despite the comprehensive research that has been done in this study, there are still several limitations in this study, 1) this study only examines the coal-mining firms indexed on the Indonesia Stock Exchange, 2) the period in this study is only 5 years, 3) this study only examines the effect of 4 independent variables, 4) this study only uses one proxy to measure each variable, both for the independent and dependent variables.

Based on the various limitations of this study, a few recommendations for future researchers are: 1) examine other sub-sectors in the mining industry, 2) use a period longer than five years, 3) add other independent variables that are expected to affect the capital structure, such as free cash flows, debt tax shields, coal price, and so on, 4) use different proxies in measuring each variable in this study.

ACKNOWLEDGMENT

The author would like to gratefully thank Dr. Sarwo Edy Handoyo, S.E., M.M. for the assistance, inputs, and guidance given through the paper-making process. Also thanking Frangky Slamet, S.E., M.M., as the Head of The Undergraduate Degree of Management Program, Universitas Tarumanagara, who has permitted the author to conduct this research.

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