**The influence of asset structure and profitability on capital structure in IDX mining firms**

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**Abstract**

This research aims to examine the influence of Asset Structure and Profitability on Capital Structure in Mining Sector Companies listed on the Indonesia Stock Exchange for the 2014-2023 period. Using a quantitative approach, the population consists of mining sector companies, with a sample of 20 data points from 2 different companies over 10 years. The data analysis methods include descriptive statistics, classical assumption tests, and multiple linear regression. The results show that both the Fixed Asset Ratio (FAR) and Return on Assets (ROA) significantly influence the Debt-to-Equity Ratio (DER). Specifically, the study finds that asset structure, as measured by FAR, has a negative but insignificant effect on capital structure, while profitability, measured by ROA, has a significant negative effect on capital structure. This implies that companies with a higher proportion of fixed assets and profitability tend to rely less on debt financing. The findings suggest that company management should utilize profits before seeking external financing and carefully assess the optimal mix of funding sources to maintain a healthy capital structure. For investors, this study provides insight into the influence of asset structure and profitability on capital structure, helping them make informed decisions when analyzing financial statements. Future research is recommended to expand the sample size, research period, and consider additional factors influencing capital structure for a more comprehensive understanding.

**Keywords:** asset structure, profitability, capital structure

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1. **Introduction**

The mining sector plays a crucial role in the Indonesian economy, contributing significantly to the Gross Domestic Product (GDP), state revenues, and employment. Indonesia’s abundance of natural resources—such as coal, nickel, gold, copper, and bauxite—positions the mining industry as a strategic driver of national economic growth. However, this sector also faces unique challenges due to the high capital requirements for exploration and production, vulnerability to global commodity price fluctuations, regulatory shifts, and macroeconomic uncertainties. These dynamics necessitate prudent financial decision-making, particularly regarding capital structure, which reflects how firms balance debt and equity to finance their operations.

Capital structure is a critical aspect of financial management, influencing a company’s risk profile and long-term performance. According to Riyanto in Kurniawan (2015), capital structure refers to the proportion of debt and equity used to finance company operations. The choice between debt and equity financing is guided by several financial theories. One is the pecking order theory, which emphasizes firms’ preference for internal financing due to lower information asymmetry (Myers in Kurniawan, 2015). Another is the trade-off theory, which proposes that firms aim for an optimal debt ratio that balances the benefits of debt, such as tax shields, against its costs, such as financial distress (Prasetyo, 2015). In this study, capital structure is proxied by the Debt-to-Equity Ratio (DER).

Among the many determinants of capital structure, asset structure and profitability stand out as pivotal. Asset structure, defined as the composition of a firm’s fixed and current assets, indicates how resources are allocated within the company. Betavia (2019) stated that companies with a high proportion of fixed assets often find it easier to secure debt financing, as these assets can serve as collateral. However, over-reliance on fixed assets can amplify financial risks, especially during periods of declining asset value or production disruptions. Therefore, a thorough understanding of asset composition is necessary when evaluating capital structure decisions.

Profitability also plays a vital role in shaping a firm’s financing strategy. Pandey (2015) explained that profitability ratios are crucial in evaluating a company's ability to generate earnings and maintain financial health. Based on the pecking order theory, firms with higher profitability typically prefer to finance growth through retained earnings rather than external debt, thus minimizing risk. In contrast, less profitable firms might depend more heavily on debt, increasing financial leverage. This relationship between profitability and capital structure is of particular interest in capital-intensive sectors such as mining.

Despite numerous studies exploring the effects of asset structure and profitability on capital structure, there remains a gap in understanding how these factors interact within the mining sector in Indonesia. The complexity of financing decisions in mining firms—shaped by fluctuating commodity prices, evolving government regulations, and sustainability concerns—demands further investigation. This study aims to analyze the influence of asset structure and profitability on the capital structure of mining companies listed on the Indonesia Stock Exchange (IDX) from 2014 to 2023. Specifically, it seeks to: (1) determine the effect of asset structure on capital structure; (2) assess the effect of profitability on capital structure; and (3) examine the joint influence of asset structure and profitability on the capital structure of mining firms in Indonesia.

1. **Research Design and Method**

The method used in this study is multiple linear regression analysis using descriptive statistical analysis. The population used is mining sector companies listed on the Indonesia Stock Exchange (IDX) for the 2014-2023 period using *non-probability sampling techniques* and has the following criteria: (1) Mining companies that have been and are still listed on the Indonesia Stock Exchange for the 2014-2023 period, (2) Mining sector companies that consistently publish their financial statements through the company's official website or the Indonesia Stock Exchange website for the 2014-2023 period. The data obtained as many as 20 consisted of 2 companies with a research period of 10 years.

1. **Results and Discussion**

***Descriptive Statistical Analysis***

Descriptive statistical tests are used to explain the minimum, maximum, mean and standard deviation values in the FAR, ROA and DER variables. The following are the results of the descriptive statistical analysis:

**Table 1 Descriptive Statistical Test Result**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **N** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** |
| FAR | 20 | 1.85 | 3.80 | 2.7540 | .53614 |
| ROA | 20 | 1.50 | 27.71 | 11.1790 | 7.20727 |
| DER | 20 | .03 | .49 | .2040 | .13116 |
| Valid N(listwise) | 20 |  |  |  |  |

Source: SPSS for windows version 27 output (2025)

Based on Table 1, an overview of the distribution of data from the 20 samples used can be explained as follows: 1) FAR (Fixed Asset Ratio) has a minimum value of 1.85, a maximum value of 3.80, a mean of 2.7540, and a standard deviation of 0.53614. This shows that the distribution of FAR is quite consistent, with data spread not too large from the average value; 2) ROA (Return on Assets) has a minimum value of 1.50, a maximum value of 27.71, an average of 11.1790, and a standard deviation of 7.20727. This value indicates that there is considerable variation in asset returns in the data sample; and, 3) DER (Debt to Equity Ratio) has a minimum value of 0.03, a maximum value of 0.49, an average of 0.2040, and a standard deviation of 0.13116. This variable shows a smaller degree of variation compared to ROA, which means that the DER value between data is more uniform.

***Classical Assumption Test***

The classical assumption test is a prerequisite test that must be done first before conducting data analysis. The classical assumption test is applied to obtain economically valid estimation results, in the sense that the analysis to be applied does not deviate from economic theory. Meanwhile, the classical assumption tests applied in this study include normality tests, multicollinearity tests, and heteroscedasticity tests and autocorrelation tests.

Normality test

The normality test was carried out by looking at the Asymp value. Sig (2-Tailed) uses the Kolmogorov-Smirnov (K-S) non-parametric statistical test. The normality test aims to test whether the independent and dependent variable data are normally distributed or not. So that if the data has been distributed normally, it can be continued to the next stage. The following are the results of the normality test.

**Tabel 2 Result of the Normality Test**

|  |  |
| --- | --- |
| N | 20 |
| Normal Parametersa,b | Mean | .0537 |
| Std. Deviation | .04393 |
| Most Extreme Differences | Absolute | .150 |
| Positive | .150 |
| Negative | -.117 |
| Test Statistic | .150 |
| Asymp. Sig. (2-tailed)c | .200d |
| Monte Carlo Sig. (2-tailed)e | Sig. | .275 |
| 99% Confidence Interval | Lower Bound | .264 |
| Upper Bound | .287 |

Source: SPSS for windows version 27 output

Table 2 shows that the significance number or Asymp. Sig. (2-tailed) obtained is 0.200 where this value exceeds 0.05 (in this case using a significance level of 5% or α = 5%) so that the residual follows the normal distribution. The variables of asset structure (FAR), profitability (ROA) and capital structure (DER) are normally distributed, thus meaning that research can be carried out at a later stage.

Multicollinearity test

The multicollinearity test aims to test whether the independent variables in the regression are not interrelated (influential). The multicollinearity test in this study was carried out by looking at the tolerance and *variance inflation factor (VIF) values.* With the condition of a tolerance value of < 0.1 and a VIF value of > 10. The following are the results of the multicollinearity test:

**Table 3. Multicolliniearity Result Test**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Model** |  | **Unstandardized Cofficients** | **Standardized Cofficients** | **t** | **Sig.** | **Collinearity Statistics** |
|  | **B** | **Std. Error** | **Beta** | **Tollerance** | **VIF** |
| 1 | (Constant) | .517 | .102 |  | 5.096 | <.001 |  |  |
|  | FAR | -.050 | .033 | -.203 | -1.517 | .148 | .946 | 1.058 |
|  | ROA | -016 | .002 | -.868 | -6.477 | <.001 | .946 | 1.058 |

Source**:** SPSS for windows version 27 output

Based on Table 3, the *tolerance* value is not below 0.1 and the Variance Inflation Factor (VIF) value shows the same value, namely there is no single variable that has a VIF value greater than 10. This can be seen from the Tolerance value of the asset structure and profitability of 0.946 and the Variance Inflation Factor of the asset structure and profitability variable of 1.058. Therefore, it can be concluded that the regression model in this study does not occur multicollinearity and the regression model is suitable for use.

Heteroscedasticity test

The Heteroscedasticity Test is a test that aims to find out if there is a residual variant dissimilarity from one observation to another in a regression model. Here are the results of the heteroscedasticity test:

**Table 4. Heteroscedasticity Test Result**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** |  | **Unstandardized Cofficients** | **Standardized Cofficients** | **t** | **Sig.** |
|  | **B** | **Std. Error** | **Beta** |
| 1 | (Constant) | .062 | .063 |  | .977 | .342 |
|  | FAR | -.002 | .020 | -.020 | -.082 | .936 |
|  | ROA | -.000 | .002 | -.052 | -.208 | .838 |

Source: SPSS for windows version 27 output

Based on Table 4, it is known that the sig value of the FAR variable is 0.936 and the ROA variable is 0.838 so that it meets the sig value which must be greater than 0.05. Therefore, it can be concluded that the above data does not detect heteroscedasticity.



**Figure 1 Scatterplot**

Source: SPSS for windows version 27 output

Based on Figure 1, it can be seen that the dots spread out and do not form a specific pattern. Therefore, it can be concluded that there is no indication of heteroscedasticity and the heteroscedasticity test is met.

Autocorrelation test

The autocorrelation test aims to detect correlations between each period of sample data used. This study uses the Durbin-Watson test. Here are the results of the Durbin Watson test:

**Table 5. Autocorrelation Test Result**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** | **Durbin Watson** |
| 1 | .844 | .712 | .678 | .07446 | 1.562 |

Source: SPSS for windows version 27 output

Based on Table 5, the dL value for n=20 and k=2 is 1.1004 and the dU value is 1.5367. Durbin Watson's value in the table above shows a figure of 1,562. So that the dU < d < 4-dU, which is 1.5367 < 1.562 < 2.4633. Based on the criteria of the Durbin Watson test value table, this result shows that there is no positive or negative autocorrelation, meaning that the regression model of this study is free from autocorrelation.

***Multiple Linear Regression Analysis***

Based on Table 3, it can be developed using a model of multiple linear regression equations as follows:

Y = 0.517 + (– 0.050) X1 + (– 0.016) X2

Information:

Y : Capital Structure

X1 : Structure Active

X2 : Profitability

The results of this regression equation as a whole show the following interpretation results are: 1) the value of the Constant (a) of the capital structure (Y) is 0.517 which states that if the variable X1 X2 is equal to zero, namely the structure of assets and profitability, then the capital structure is 0.517; 2) the regression coefficient X1 (b1) which is an asset structure of – 0.050 means that every addition to the asset structure variable of one unit assuming that the other variables are considered constant, will decrease the level of capital structure by 0.050; and, 3) the regression coefficient X2 (b2), which is a profitability variable of – 0.016, means that any addition to the profitability variable of one unit, assuming the other variables are considered constant, will decrease the level of capital structure by 0.016.

***Coefficient of determination (R square)***

The determination coefficient in linear regression is intended to determine how much all-independent variables are capable of explaining the variance of their bound variables. Tabel 5shows that the determination coefficient (R2) figure is 0.712 This means that the ability of the asset structure and profitability variables to explain the variation in the capital structure variable is 71.2% while the remaining 28.8% (100-71.2%) is explained by other factors outside the regression model analyzed.

***Hypothesis test***

Partial test (t-test)

Based on Table 3, the results of the t test can be concluded that in the asset structure variable, t is obtained as – 1.517 with a significance of 0.148 which is above 0.05. Thus H1 is accepted, which means that there is a partial negative influence between the X1 variable of the asset structure and the Y variable of the capital structure. Meanwhile, the profitability variable was obtained with a calculation of – 6.477 with a significance of 0.001 whose value was below 0.05. Thus H2 is accepted, which means that there is a partial negative influence between the X2 profitability variable and the Y variable of capital structure.

Simultaneous test (F-test)

**Table 6. Simultaneous Test (F-Test)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Model** |  | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| 1 | Regression | .233 | 2 | .116 | 20.976 | <.001 |
|  | Residual | .094 | 17 | .006 |  |  |
|  | Total | .327 | 19 |  |  |  |

Source: SPSS for windows version 27 output

Based on Table 6, an F value of 20.976 was obtained with a significance value of 0.001<0.05. This shows that the independent variables of the asset structure proxied with FAR and the profitability proxied with ROA affect simultaneously the dependent variable, namely the capital structure proxied with DER. The model used to test the FAR and ROA is a fit model.

***The influence of asset structure on capital structure***

The results of the study show that the first hypothesis in this study is accepted, namely that the asset structure has an insignificant negative effect on the capital structure of mining sector companies on the IDX for the 2014-2023 period. The negative direction of the results in this analysis means that the higher the asset structure reflected through the comparison between current assets and fixed assets, the higher the company's capital structure will increase. The results of the insignificant study show that in making decisions for capital structure, mining sector companies on the IDX in the 2014-2023 period do not consider the asset structure too much in making capital structure decisions. The results obtained in this study are strengthened by the results of previous research conducted by Hamidah et al. (2016) and Widodo (2013) which showed that the asset structure had a negative but not significant influence on the company's capital structure.

***The effect of profitability on capital structure***

The results of the study show that the second hypothesis in this study is accepted, namely profitability has a significant negative effect on the capital structure. This indicates that the greater the level of profitability obtained by the company, the lower the company's capital structure derived from debt. This negative influence is in accordance with *the pecking order theory* which states that companies are more likely to prioritize the use of their own capital as a source of internal funding. Companies with high profitability have adequate internal funds so that the company will use internal funds first. This is in line with research conducted by Udayani and Suaryana (2013) and Nita and Hairul (2017), which stated that high rates of return also make it possible to finance most of the funding needs generated internally.

***The influence of asset structure and profitability on capital structure***

The results of the simultaneous test showed that the F count was 20.976 with a significance of 0.001 < 0.05. The results show that asset structure and profitability together affect the capital structure. Therefore, the third hypothesis in this study is accepted.

1. **Conclusions**

Based on the results of this study, it can be concluded that the influence of asset structure and profitability on capital structure in mining sector companies listed on the Indonesia Stock Exchange for the 2014-2023 period, namely asset structure variables have a negative effect on capital structure. Thus, the first hypothesis that states that asset structure has a negative effect on capital structure is accepted. And the profitability variable has a negative effect on the capital structure. Thus the second hypothesis that the profitability is negative towards the capital structure is accepted.

This research provides important implications for company management, investors and other stakeholders in designing more effective financial strategies. Company management should take advantage of profits before borrowing from external parties and determine the optimal source of funding to form a good capital structure. And investors are expected to use this research as information about the influence of asset structure and profitability on the capital structure of their destination in order to better understand financial statements before investing. Further research is suggested to expand the scope of the population and research period as well as consider other factors affecting the capital structure to provide a more comprehensive picture.

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