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Research Article

The Effect of Leverage and Profitability on Firm Value Moderated by Firm Size

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Abstract
The study aimed to investigate how the leverage ratio impacts the value of a firm. It also aimed to examine how the profitability ratio affects firm value. Furthermore, the research aimed to investigate if the size of a company has any influence on how leverage affects the overall value of the firm. Additionally, the research delved into how profitability's impact on a company's worth is influenced by its size. The study utilizes a quantitative approach for analyzing the data, which will be presented in a structured format and undergo statistical analysis. The main subject of this study is the group of coal subsector businesses that are publicly traded on the Indonesia Stock Exchange between 2021 and 2023, which comprises a total of forty-three companies. The researchers used purposive sampling to choose participants for the study, ultimately collecting 48 data. The information was examined through Moderated Regression Analysis (MRA), revealing that the Debt-to-Equity Ratio (DER) negatively affects the worth of the company. The Return on Asset (ROA) does not have a noteworthy influence on firm value. The total size of assets does not influence the link between debt levels and firm value. Having a large amount of total assets may diminish the link between how profitable a company is and its overall value.

Keywords: Leverage, Profitability, Firm Value, Firm Size

1. Introduction

The primary goal of enhancing business value is to provide financial success for shareholders or corporate owners. The value of a corporation reflects the whole value of the company, considering factors such as assets, debts, and ownership stakes. A key benefit of this objective is enhancing the firm's ability to compete effectively, solidify its position in the market, and secure enduring prosperity. Enhancing the firm's value is synonymous with maximizing the current worth of anticipated cash flows or earnings that investors will receive in the upcoming periods. Various factors, including the company's capital configuration, also play a role in determining firm value. According to Mulyawan (2019), capital structure theory identifies structural funding that reduces firm value. The ideal capital structure of a successful business consists of a combination of capital, equity, and debt to maximize share prices. The worth of a company is reflected in the value assigned to its assets and resources. It indicates the market value of the business and its significance in terms of currency at a specific moment. Understanding firm value is crucial in business finance and investment, as it is used to assess, analyze, and make decisions. One method for evaluating the true worth of a stock is through the price-to-book value ratio. Shareholders may encounter challenges when a company's stock price drops, leading to potential financial struggles. Conversely, an increase in a company's stock price can also result in higher levels of shareholder debt (Erfada & Priono, 2024).

Different aspects such as leverage and profitability can influence the overall worth of a business. The leverage ratio is a key indicator for stakeholders, giving them insight into the company's financial

risk. While taking on debt can offer advantages like tax-deductible interest, it also heightens the chances of bankruptcy if the company cannot meet its repayment commitments. Therefore, it is important for investors and analysts in their capital structure and the associated risk implications. The Debt to Equity Ratio is used in this research as a measurement of leverage. It gauges the ratio of debt to equity in the company (Murhadi, 2013). The Debt to Equity Ratio measures how much debt a corporation has relative to its equity in its financial structure. This ratio provides an overview of the proportion of funds financed by creditors (through debt) compared to funds financed by owners (through equity). A high ratio of debt to equity signifies that the company depends heavily on borrowing, whereas a low ratio indicates that the company relies more on its own funds or equity.

Profitability indicates how well a company is turning a profit from its business activities and managing its finances efficiently. These ratios allow stakeholders to analyze the company's financial progress over a period and assess its competitiveness within the industry. The efficiency of operations, cost control, and asset management are all critical components that are highlighted by these profitability ratios. The study utilizes the Return on Asset as the key profitability measure. Return on Assets (ROA) assesses how effectively a firm can create profit from its assets. Return on Asset assesses a company's capacity to profit from its investments and resources. A corporation with a high Return on Asset is adept at converting its assets into earnings. Conversely, a lower Return on Asset could indicate that the company is not maximizing the efficiency of its assets or is experiencing restricted profitability.

There have been many research studies looking into how factors such as leverage, profitability, and company size can influence the overall value of a firm, as based on Safrida (2008), Firm Value is enhanced by the profitability of a business. According to Rutin et al. (2019), Firm Value is influenced by both Leverage and Profitability. According to Nadiya et al. (2023), Company Value is influenced by profitability, and the size of the company can help regulate how much profitability impacts Company Value. According to Erdiyaningsih et al. (2021), Profitability affects Company Value. According to Tio & Prima (2022), simultaneously and partially Profitability affects Company Value. According to Astari et al. (2019), Profitability affects Company Value.

The study aimed to examine how the leverage ratio impacts the value of a company. The study also aimed to evaluate the impact of the profit margin on a company's worth. Moreover, the research examined the relationship between the size of a company and the effect of leverage on firm value. Finally, the study explored how the size of a company affects how profitability influences firm value.

2. Methods

In this study, a quantitative technique is employed to examine the data, which will be formatted and statistically analyzed. The primary focus is on studying the group of forty-three coal subsector firms that will be publicly listed on the Indonesia Stock Exchange between 2021 and 2023. The method of selecting samples used purposive sampling. The guidelines for sampling in this research are listed below:

1) Coal firms in the coal sub-sector will be listed on the Indonesia Stock Exchange between 2021 and 2023.
2) Coal firms listed on the Indonesia Stock Exchange have failed to present comprehensive annual report data for the fiscal years 2021-2023.
3) Coal firms listed on the Indonesia Stock Exchange that showed losses in their financial accounts from 2021 to 2023.

Considering these specifications, among the 43 publicly listed coal sub-sector companies on the Indonesia Stock Exchange between 2021 and 2023, 16 have been listed for three years or more, totaling 48 data points. This research utilizes two distinct variables as part of the analysis, including:

a. Leverage (X_1)

Leverage is a business strategy related to the capital used to change an organization's operations. The Debt to Equity Ratio (DER) indicator is a tool for assessing leverage. The Debt to Equity Ratio (DER) analysis provides insights into how a business secures its funding. The importance of the Debt to Equity Ratio (DER) in this research emphasizes its significance as a measure of leverage. The debt-to-equity ratio evaluates the balance between a company's obligations and shareholder equity (Murhadi, 2013). According to research of Rutin et al. (2019), determining financial leverage by calculating the Debt to Equity Ratio with the given equation:

Debt to Equity Ratio = (total debt / total equity) × 100%

b. Profitability (X_2)

Profitability ratios are helpful in assessing the amount of profit a company generates based on its sales, assets, and share capital (Halim, 2015). This study focuses on the profitability ratio of Return on Assets. The evaluation looks at the possible profit gained for each dollar put into an asset, with the belief that a higher return on assets indicates a higher asset value (Murhadi, 2013). According to research (Rutin et al., 2019) measuring profitability using Return on Asset using the following formula:

Return On Asset = (net income / total assets) × 100%

This study centers on the company's worth as the outcome of interest. The firm's value is determined by calculating the overall value of its physical and non-physical assets, minus any debts that are still owed. This research assesses the value of a company by using the price-to-book value method, a frequently used technique to determine a company's worth on the Indonesia Stock Exchange. The utilization of the price book value method is preferred due to its effectiveness, despite some drawbacks such as the inability to consider qualitative aspects and fluctuations in book value that may impact stock prices.

Price Book Value = (Market Price per Share / Book Value per Share)

This study revolves around the impact of firm size on the overall outcomes. A company's size is a defining element that represents the scope of its operations in a certain area. This research assesses the company's size using the total assets technique.

Size = Ln (Total Asset)

3. Results and Discussion

3.1. Research Results

3.1.1. Classical Assumption Test

Table 1. Normality Test Results 1

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		48
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.63732645
Most Extreme Differences	Absolute	.142
	Positive	.142
	Negative	-.095
Test Statistic		.142
Asymp. Sig. (2-tailed)		.017[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Source: SPSS processed data, 26

After analyzing the data with the Kolmogorov-Smirnov method as shown in Table 1, it is evident that the residual values deviate significantly from a normal distribution. The Asymp, Sig value of 0.017 provides backing for this assertion, indicating a significance level below the conventional threshold of 0.05.

Table. 2. Normality Test Results 2

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			48
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		.63732645
Most Extreme Differences	Absolute		.142
	Positive		.142
	Negative		-.095
Test Statistic			.142
Asymp. Sig. (2-tailed)			.017[c]
Monte Carlo Sig. (2-tailed)	Sig.		.263[d]
	99% Confidence Interval	Lower Bound	.252
		Upper Bound	.275

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. Based on 10000 sampled tables with starting seed 299883525.

The results of the monte carlo test displayed in table 2 unveiled that the residual values in this particular research study followed a Gaussian distribution pattern. The significant value of 0.017 from the initial test rose to 0.263 after the monte carlo test. With a significant value of 0.263 exceeding 0.05, it suggests that the residual value follows a normal distribution.

Table 3. Multicollinearity Test Results

Coefficients[a]			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Leverage	.987	1.013
	Profitability	.989	1.011
	Firm Size	.991	1.009

Source: SPSS processed data, 26

After analyzing the information provided in the table 3, it is evident that the tolerance values for each variable are all above 0.10. Also, after performing calculations, it was determined that the VIF values are less than 10. Therefore, it can be concluded that there is no presence of multicollinearity in the regression model.

Table 4. Heteroscedasticity Test Results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.275	.288		.955	.345
	Leverage	-.072	.045	-.234	-1.614	.114
	Profitability	.140	.147	.138	.950	.347
	Firm Size	.013	.014	.134	.925	.360

Source: SPSS processed data, 26

According to the findings of the Glejser test illustrated in table 4, it is evident that there are no issues with heteroscedasticity present in the data. This can be proven by assessing the significance of each variable, Leverage (0.114), Profitability (0.347), Company Size (0.360) which exceeds the 0.05 confidence level.

Table 5. Autocorrelation Test Results

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.831[a]	.691	.677	.59755	1.734

Source: SPSS processed data, 26

According to the findings in table 5, the Durbin Watson value is 1.734, indicating autocorrelation at a significance level of 0.05. There are 48 samples, 2 independent variables, a lower limit (dL) of 1.4500, and an upper limit (dU) of 1.6231. Thus, the value of dU < DW < 4-dU or 1.623 < 1.734 < 2.376. Hence, it is evident from the analysis that the regression model employed in this study shows no signs of autocorrelation.

3.1.2. Multiple Linear Regression Analysis

Table 6. Multiple Linear Regression Results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.532	.135		11.350	.000
	Leverage	-.342	.075	-.436	-4.583	.000
	Profitability	-1.553	.246	-.600	-6.307	.000

Source: SPSS processed data, 26

After conducting various linear regression analyses, we were able to derive a specific equation as below:

$$Y= 1{,}532-0{,}342X_1-1{,}553X_2$$

The following outcomes are derived from the findings of the equation provided above:

1) The constant value is 1.532. If Leverage and Profitability are set to zero or kept constant, the company value will remain at 1.532, as indicated by the constant value.
2) The coefficient of the leverage variable with the Debt to Equity Ratio (DER) proxy of -0.342, the coefficient indicates that an increase of one unit in the Debt to Equity Ratio (DER) will lead to a decrease in the company's value by -0.342.
3) The coefficient of the profitability variable with the Return on Asset (ROA) proxy is -1.553 this coefficient indicates where an increase in Return on Asset (ROA) by one, the company's value is expected to decrease by -1.553.

3.1.3. Partial Test (T-Test)

The findings from the t-test display the t-value and statistical significance of each factor within the regression analysis:

1) Testing the impact of leverage variables on firm value

Table 6 data clearly shows that the Debt to Equity Ratio (DER) as a measure of leverage had a t-value of -4.583, indicating a decreasing trend. The statistical significance of leverage is shown by a value of 0.000, which is less than 0.05, signifying its importance. Consequently, it can be deduced that using leverage negatively affects the worth of a company, supporting the validation of hypothesis H1.

2) Testing the impact of profitability variables on firm value

The analysis from table 6 indicated that according to the proxy Return on Asset (ROA), profitability had a t-value of -6.307 in a downward trend. This significant finding indicated that profitability had a value of 0.000, which is less than 0.05, signifying its relevance. Consequently, the study suggests that high profits actually hurt the overall worth of a company, causing the hypothesis H2 to be dismissed.

3.1.4. Moderated Regression Analysis (MRA)

Table 7. Moderated Regression Analysis (MRA) Results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.168	.704		-.239	.812
	Leverage * Firm Size	-.023	.029	-.666	-.806	.425
	Profitability * Firm Size	-.151	.060	-1.451	-2.515	.016

Source: SPSS processed data, 26

1) The impact of leverage is influenced by the firm size being tested.

According to the results presented in table 7, the correlation between Leverage and Firm Size yielded a t-value of -0.806 in a downward direction. The significance value of Leverage * Firm Size was calculated to be 0.425, which exceeds 0.05, indicating a lack of significance. Therefore, the impact can be inferred from the findings of leverage on the value of a company is not affected by the size of the firm, which results in the hypothesis H3 being dismissed.

2) The impact of profitability on firm value is influenced by the firm size.

As presented in table 7, it is evident that the interaction between Profitability and Firm Size resulted in a t-value of -2.515, indicating a negative relationship. This interaction also yielded a significant value of 0.016, which is less than the threshold of 0.05, signifying importance. Therefore, it can be inferred that the impact of a company's size on its value can change depending on its profitability, which confirms the accuracy of hypothesis H4.

3.1.5. Coefficient of Determination (R^2)

According to the findings in table 5, the test conducted revealed an Adjusted R-square value of 0.677. This implies that approximately 67.7% of the factors affecting firm value are attributed to leverage and profitability variables. Other factors that were not considered in the research are responsible for the remaining 32.3%.

3.2. Discussion

3.2.1. The Impact of Leverage on Firm Value

Utilizing corporate leverage used to enhance the chances of generating profits for shareholders by supporting assets or activities. This research focuses on debt-to-equity ratio as a metric for leverage. In the partial test, the Debt to Equity Ratio (DER) showed a noteworthy figure of 0.000, suggesting it falls under the threshold of 0.05. The t-value was noted as -4.583. This indicates that in the coal sub-sector mining companies listed on the Indonesia Stock Exchange (IDX) during the period of 2021-2023, leverage had a notable negative impact on firm value.

The outcome from this investigation align with the findings from a study carried out by Izzah (2017) showing that the firm value is significantly impacted by the Debt to Equity Ratio, which is due to the heightened risk of corporate bankruptcy associated with high levels of leverage. Low leverage can be considered a signal that they have more controllable financial risk, this statement is also in accordance with signaling theory.

3.2.2. The Impact of Profitability on Company Value

Profitability metrics are a useful method for evaluating how effectively a company can generate profit when compared to its revenue, resources, ownership, and other financial details. The company's performance can be seen through these ratios, which demonstrate their effectiveness in leveraging available resources to generate profits. This research paper focuses on the Return on Asset ratio as a key indicator of profitability. Return on Asset is an indicator of how well a company can make profits from its assets. The partial test, known as t-test, suggests that the value of a company is not influenced by its profitability. An analysis of coal mining companies in Indonesia from 2021 to 2023 showed that profitability actually had a detrimental effect on their overall value, with a significant negative impact observed. This was evidenced by a significance level below 0.05 and a t-value of -6.507.

Profitability is a measurement that illustrates how well a company can make substantial profits for its shareholders. The impact of the Return on Assets (ROA) on the value of a firm is noteworthy, as it suggests that enhancing efficiency in asset utilization may not always lead to an increase in firm value. The connection between strong and weak financial performance and the worth of a company is not straightforward. The measure of profitability represented by ROA may not play a significant role in determining firm value, as it simply reflects the return on investment garnered by investors. This study aligns with previous study by Apriliyanti et al. (2019) which identified that a negative and significant coefficient value suggests a rise in profitability among coal sub-sector companies, but does not necessarily mean there will be a subsequent increase in the value of the firm.

3.2.3. The Impact of Leverage on Firm Value with Firm Size as Moderation

According to the results from the partial test research (t-test), there is no connection between leverage and company value when taking into account the size of the company as a moderating element. The importance value of 0.425 provides backing for this argument, as it surpasses the typical threshold of 0.05. Additionally, the t-value of -0.806 suggests that the size of a company minimally affects its overall value in a negative manner. The results indicate that during the years 2021 to 2023, the size of a company does not impact the relationship between leverage and firm value for mining companies in the coal industry trading on the Indonesia Stock Exchange (IDX).

The study findings suggest that the scale of a business has no impact on influencing the relationship between debt and company worth, since the p-value exceeds 0.05. The size of a company has no impact on how leverage affects the overall value of the business. Firm size does not affect the use of debt to meet operational costs. The level of debt that a company takes on remains unchanged when exercised in moderation, thus having no impact on the overall value of the firm. A company's high level of debt does not always result in a higher value, and in reality, it can decrease the value when the amount of debt decreases. This study aligns with previous research studies carried out by Sari et al. (2022) which discovered that company size does not moderate leverage because the coefficient value is not significant. When the leverage is high, the company's worth does not rise even if it has a large asset portfolio.

3.2.4. The Impact of Profitability on Firm Value with Firm Size as a Moderating Variable

The results of the study suggest that company size does not impact the correlation between profitability and overall value of a company. The impact of company size on firm value is evident through statistical analysis, with a significance value of 0.016 greater than the critical value of 0.05 and a t-value of -2.515. The results indicate a link between debt and business worth in coal mining companies listed on the Indonesia Stock Exchange from 2021 to 2023, with the size of the company influencing this connection.

The study results suggest that the size of a company can play a significant role in impacting profitability and ultimately the firm's value. This is evidenced by a statistically significant value below 0.05. The implication here is that as a company grows larger, the link between profitability and its overall worth weakens. The costs associated with operating a company increase proportionally with its size. This is because the profitability obtained by the company is determined through policies taken by management to be able to increase sales and reduce operating costs efficiently and effectively. This study aligns with previous research conducted by Izzah (2017), Studies have revealed that the size of a company plays a significant role in determining its level of profitability, with larger companies experiencing lower value when profitability is weak. This indicates that company size can weaken profitability as shown by the significant coefficient value.

4. Conclusion

After analyzing the results and discussions, it is clear that the Debt to Equity Ratio (DER) that signifies leverage plays a crucial role in determining the value of a company. On the other hand, the Return on Asset, which measures profitability, has a relatively insignificant impact on the overall worth of a company. The total size of a company, indicated by Total Assets (SIZE), does not have a significant effect on the correlation between leverage and company value. However, the company's size, as determined by Total Assets (SIZE), does weaken the relationship between profitability and the value of the company.

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