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Article

DRIVERS OF FIRM VALUE: PROFITABILITY MEDIATING LEVERAGE AND FIRM SIZE IN MINING COMPANIES

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ABSTRACT

This study examines the effects of leverage and firm size on firm value, as well as the mediating role of profitability in mining companies listed on the Indonesia Stock Exchange. The mining sector, being capital-intensive and sensitive to global commodity price fluctuations, requires effective financial management to sustain firm value and investor confidence. A quantitative causal-comparative design was applied, with data analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS 4. The sample consisted of 75 observations from mining companies during the 2022–2024 period The results indicate that leverage has a positive and significant effect on firm value, while firm size shows a positive but non-significant effect. Profitability has a strong positive influence on firm value. However, neither leverage nor firm size significantly affects profitability, and profitability does not mediate the relationship between these variables and firm value. These findings highlight the importance of managing leverage and enhancing profitability to improve firm value in the mining sector. This study contributes to the literature by clarifying the role of financial structure and profitability in firm valuation within capital-intensive industries. Practically, the results provide guidance for mining companies in optimizing financial strategies and strengthening investor confidence, while policymakers may consider measures to support profitability stability and market performance.

KEYWORDS

Firm size, firm value, leverage, mining sector, profitability

ABSTRAK

Penelitian ini menganalisis pengaruh leverage dan ukuran perusahaan terhadap nilai perusahaan, serta peran profitabilitas sebagai variabel mediasi pada perusahaan pertambangan yang terdaftar di Bursa Efek Indonesia. Sektor pertambangan, sebagai industri yang padat modal dan sensitif terhadap fluktuasi harga komoditas global, memerlukan manajemen keuangan yang efektif untuk menjaga nilai perusahaan dan kepercayaan investor. Desain penelitian kuantitatif kausal-komparatif diterapkan dalam studi ini, dengan analisis data menggunakan Partial Least Squares Structural Equation Modeling (PLS-SEM) melalui perangkat lunak SmartPLS 4. Sampel penelitian terdiri dari 75 observasi dari perusahaan pertambangan selama periode 2022–2024. Hasil penelitian menunjukkan bahwa leverage berpengaruh positif dan signifikan terhadap nilai perusahaan, sementara ukuran perusahaan menunjukkan pengaruh positif namun tidak signifikan. Profitabilitas ditemukan memiliki pengaruh positif yang kuat terhadap nilai perusahaan. Namun, baik leverage maupun ukuran perusahaan tidak berpengaruh signifikan terhadap profitabilitas, dan profitabilitas tidak memediasi hubungan antara variabel-variabel tersebut terhadap nilai perusahaan. Temuan ini menegaskan pentingnya pengelolaan leverage dan peningkatan profitabilitas untuk mengoptimalkan nilai perusahaan di sektor pertambangan. Penelitian ini berkontribusi pada literatur dengan memperjelas peran struktur keuangan dan profitabilitas dalam penilaian perusahaan pada industri padat modal. Secara praktis, hasil ini memberikan panduan bagi perusahaan pertambangan dalam mengoptimalkan strategi keuangan dan memperkuat kepercayaan investor, sementara bagi pembuat kebijakan, hasil ini dapat menjadi pertimbangan dalam merumuskan langkah-langkah untuk mendukung stabilitas profitabilitas dan kinerja pasar.

KATA KUNCI:

Leverage, nilai perusahaan, profitabilitas, sektor pertambangan, ukuran perusahaan

INTRODUCTION

In Indonesia, the mining sector is one of the strategic sectors that contributes significantly to the national economy. This contribution can be observed through the development of the Gross Domestic Product (GDP) of the mining sector, which has shown relatively strong performance in recent years. Data indicate that Indonesia's mining GDP increased to IDR 246,612.40 billion in the fourth quarter of 2025, rising from IDR 237,213.00 billion in the third quarter of 2025. On average, the mining sector contributed IDR 202,975.57 billion to GDP between 2010 and 2025, reaching its highest level of IDR 249,881.10 billion in the fourth quarter of 2024 and its lowest level of IDR 171,254.70 billion in the first quarter of 2010. However, the mining GDP declined to IDR 234,230.90 billion in the first quarter of 2024, compared to IDR 240,379.10 billion in the fourth quarter of 2023 (Trading Economics, 2026). These figures indicate that although the mining sector has substantial economic potential, it remains highly sensitive to global economic dynamics.

Despite its significant economic contribution, mining companies face various challenges, including fluctuations in global commodity prices, changes in government policies, and high operational risks. Commodity price volatility, particularly for coal and nickel, can significantly affect the financial performance of mining companies. Such instability

may ultimately influence firm value, which is reflected in stock price movements in the capital market. Therefore, mining companies are required to manage their financial resources effectively in order to improve corporate performance and maintain firm value in the eyes of investors.

Firm value is an important indicator that reflects investors' perceptions of a company's performance and future prospects. Firm value is often associated with stock prices, as stock prices reflect a company's ability to create wealth for its shareholders. From a financial management perspective, increasing firm value is one of the primary objectives of a company because it relates to business sustainability and the company's ability to attract investment. Companies with higher firm value tend to gain greater investor confidence, which facilitates access to funding sources for business expansion. Therefore, identifying the factors that influence firm value has become an important focus in corporate finance research (Wulandari & Mujiyati, 2024).

In financial research, firm value is often proxied using Tobin's Q, a ratio that compares the market value of a company with the book value or replacement cost of its assets. This ratio was developed by economist James Tobin, who argued that Tobin's Q can illustrate how the market evaluates a firm's future prospects and performance. A Tobin's Q value greater than one indicates that the market perceives the company as having strong growth prospects, whereas a value below one suggests that the firm is considered less efficient in utilizing its assets. In empirical studies on firm value in Indonesia, Tobin's Q is widely used because it reflects investors' perceptions of company performance through stock prices and market equity values (Dewi & Abundanti, 2019; Puri et al., 2024; Putri et al., 2024; Wulandari & Mujiyati, 2024). Furthermore, several studies emphasize that Tobin's Q is an effective indicator for analyzing the influence of internal company factors such as leverage, firm size, and profitability on firm value because it integrates market information with the company's fundamental conditions (Adelia et al., 2024; Aditya et al., 2021; Astawinetu et al., 2023).

The following table presents an overview of firm value based on Tobin's Q in several mining companies in Indonesia.

Table 1. Comparison of Tobin's Q Values

No.	Company Code	Tobin's Q Values		
		2022	2023	2024
1	BUMI	1.451	1.657	2.773
2	HRUM	0.225	0.281	0.308

Source: Processed Data (2026)

Based on the Tobin's Q concept, firm value can be interpreted from the comparison between the company's market value and the book value or replacement value of its assets. When Tobin's Q is greater than one, the market perceives the company as having strong growth prospects, indicating that its market value exceeds the value of its assets. Conversely, a Tobin's Q value below one suggests that the firm is considered less efficient in utilizing its assets or that the market assigns relatively lower expectations to the company's performance and future prospects. Based on the table, PT Bumi Resources Tbk (BUMI) shows a Tobin's Q value above one throughout the observation period, with 1.451 in 2022, 1.657 in 2023, and increasing significantly to 2.773 in 2024. This trend indicates that the market has increasingly positive expectations regarding the company's future performance. The increase

in Tobin's Q also implies that investors perceive stronger growth prospects and believe that the company is capable of creating higher value relative to its assets.

In contrast, PT Harum Energy Tbk (HRUM) recorded Tobin's Q values below one in all observed years, with 0.225 in 2022, 0.281 in 2023, and 0.308 in 2024. Although the value shows a gradual increase each year, it remains below one, indicating that the company's market value is still lower than its book value. This condition suggests that the company has not yet optimized the utilization of its assets to increase firm value in the eyes of investors, or that the market still perceives its prospects as relatively lower compared to companies with higher Tobin's Q values. Thus, the comparison between these two companies shows that BUMI has a higher firm value than HRUM based on the Tobin's Q indicator, as the market assigns a greater valuation to the assets owned by BUMI.

In the context of increasing firm value, internal company factors play an important role. One of the key factors commonly analyzed in corporate finance is leverage, which reflects the extent to which a company uses debt to finance its operational and investment activities. According to Trade-Off Theory, the use of debt can provide tax advantages that potentially increase firm value if managed optimally. However, excessive leverage may increase financial risk and the likelihood of financial distress. Therefore, effective leverage management is crucial for maintaining financial stability while enhancing firm value. Several previous studies have found that leverage significantly influences firm value (Adelia et al., 2024; Adisty et al., 2024; Ajiani & Mubaraq, 2023; Dewi & Abundanti, 2019). However, other studies report that leverage does not have a significant effect on firm value (Fadhillah et al., 2024; Putri et al., 2024; Zakaria et al., 2024).

In addition to leverage, firm size is also commonly used as an indicator to evaluate a company's strength and stability. Larger firms generally possess greater resources, wider access to financing, and higher investor confidence. From the perspective of Signaling Theory, large companies tend to provide positive signals to investors regarding their ability to manage assets and generate profits. Therefore, firm size is often associated with increased firm value in the capital market. Several studies have shown that firm size has a positive effect on firm value (Fadhillah et al., 2024; Putri et al., 2024; Radja et al., 2025). However, other studies indicate that firm size does not significantly affect firm value (Annisya et al., 2025; Puri et al., 2024).

Another important factor influencing firm value is profitability, which reflects a company's ability to generate profits from its operational activities. Companies with high profitability tend to be more attractive to investors because they demonstrate efficiency in managing corporate resources. Most studies have found that profitability has a positive and significant effect on firm value (Adisty et al., 2024; Annisya et al., 2025; Putri et al., 2024). However, some studies show different results, indicating that profitability does not significantly affect firm value (Fajri et al., 2023) and may even have a negative effect (Fadhillah et al., 2024; Radja et al., 2025).

Furthermore, profitability is often used as an intervening variable that mediates the relationship between other financial factors and firm value. Dewi & Abundanti (2019) found that profitability mediates the effect of leverage and firm size on firm value. Similarly, (Radja et al., 2025) reported that firm size positively affects firm value through profitability, while

leverage shows a positive but insignificant effect. In addition, Adelia et al. (2024) demonstrated that leverage and firm size can influence firm value through profitability as an intervening variable.

Nevertheless, previous studies still present inconsistent findings. Fajri et al. (2023) found that leverage and firm size do not significantly affect profitability or firm value in mining companies. Another study by Fadhillah et al. (2024) revealed that profitability has a negative effect on firm value, while leverage has no effect on firm value. These inconsistent findings indicate the existence of a research gap regarding the relationship between leverage, firm size, profitability, and firm value.

Moreover, most previous studies have focused on manufacturing, consumer goods, healthcare, and banking sectors. Studies that specifically examine the relationship between leverage, firm size, profitability, and firm value in the mining sector remain relatively limited. This is important because the mining industry has distinct characteristics compared to other sectors, including high capital intensity and strong dependence on global commodity price fluctuations**.** This study contributes both theoretically and practically. Theoretically, it enriches the corporate finance literature by providing empirical evidence on the role of profitability as a mediating variable in the relationship between leverage, firm size, and firm value, particularly within the context of capital-intensive industries such as mining. Practically, the findings offer insights for corporate managers in formulating financial strategies related to capital structure and asset management, as well as for investors and policymakers in understanding the key determinants of firm value in the mining sector. Based on this background, the objective of this study is to analyze the effect of leverage and firm size on firm value and to examine the role of profitability as an intervening variable in mining companies listed on the Indonesia Stock Exchange.

METHOD

This study employs a quantitative research approach**.** A quantitative approach emphasizes the use of numerical data and statistical analysis to objectively and systematically examine the relationships among research variables. This approach is commonly used to analyze the effect of independent variables on dependent variables and to evaluate the relationships among variables within a research model (Dewi & Abundanti, 2019). This study is classified as causal research, which aims to analyze the cause-and-effect relationship between variables. Specifically, this research examines the effect of independent variables on the dependent variable while incorporating an intervening variable that functions as a mediating variable in the relationship among the research variables.

The object of this study is mining companies listed on the Indonesia Stock Exchange. The dependent variable examined in this research is Firm Value (Y), while the independent variables are Leverage (X1) and Firm Size (X2). In addition, Profitability (Z) is included as an intervening variable. This study aims to provide insights and serve as a reference for predicting the future condition of firm value in mining companies, particularly when potential financial challenges occur. The operational definitions of the variables used in this study are presented as follows:

Table 2. Operational and Measurement of Research Variables

Variable	Indikator	Measurement	Scale
Firm Value (Y)	Tobin's Q	$Tobin's\ Q = \frac{Market\ Value\ of\ Equity + Total\ Debt}{Total\ Assets}$ (Dewi & Abundanti, 2019; Putri et al., 2024)	Ratio
Leverage (X1)	Debt to Equity Ratio (DER)	$DER = \frac{Total\ Debt}{Total\ Equity}$ (Adelia et al., 2024)	Ratio
Firm Size (X2)	Company Size	Firm Size = ln (*Total Assets*) (Radja et al., 2025)	Ratio
Profitability (Z)	Return on Assets (ROA)	$ROA = \frac{Net\ Income}{Total\ Assets}$ (Astawinetu et al., 2023)	Ratio

Sources: Complied by the Author, (2026)

The population in this study consists of all mining companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period, totaling 71 companies. The research sample was determined using the purposive sampling technique, which is a method of selecting samples based on specific criteria so that the selected samples can represent the characteristics of the population and align with the research objectives. This method was used to select companies that meet the predetermined criteria, ensuring that the data obtained are relevant for analysis.

Table 3. Purposive Sampling

No.	Description	Amount
1.	Mining companies listed on the Indonesia Stock Exchange during the 2022–2024 period	71
2.	Companies that did not publish complete annual reports consecutively during the 2022–2024 period	(12)
3.	Mining companies that did not record a profit during the 2022–2024 period	(34)
	Sample	**25**
	Total Sample Observations (x 3 years)	**75**

Sources: Complied by the Author, (2026)

In the data processing technique, this study employs descriptive statistics and three stages of analysis, namely outer model analysis**,** inner model analysis**,** and hypothesis testing. This research uses the Partial Least Square (PLS) approach as the data analysis method. PLS is an alternative approach to Structural Equation Modelling (SEM) used to analyze relationships between latent variables with the assistance of SmartPLS 4 software version 4.0. In this model, ROA mediates the relationship between Leverage and Firm Size on Firm Value, meaning that the analysis examines both direct effects and indirect effects through ROA.

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive Analysis is a data analysis method used to describe the variables contained in the data, including the standard deviation, mean, as well as the maximum and minimum values. Descriptive statistics are statistical methods used to explain the main research problems by utilizing sample data from the companies that have been determined. The following are the descriptive statistical results in this study:

Table 4. Descriptive Statistics

Variabel	Mean	Median	Observed Min	Observed Max	N	Std. Deviation	Excess Kurtosis	Skewness	Cramér–von Mises Statistic	Cramér–von Mises p-value
DER	0.385	0.310	0.114	1.584	75	0.232	8.358	2.062	0.238	0.002
Ln_Asset	30.513	30.634	26.010	32.758	75	1.396	0.761	-0.972	0.322	0.000
ROA	0.155	0.112	-0.165	0.616	75	0.165	0.638	0.756	0.229	0.002
Tobin's Q	1.390	0.554	0.115	12.944	75	2.450	14.470	3.725	2.221	0.000

Source: Output SmartPLS version 4.0 (2026)

Table 4 presents the descriptive statistics and normality test results for the variables used in this research, including Leverage (DER), Firm Size (Ln_Asset), Profitability (ROA), and Firm Value (Tobin's Q). The total number of observations used in this study is 75.

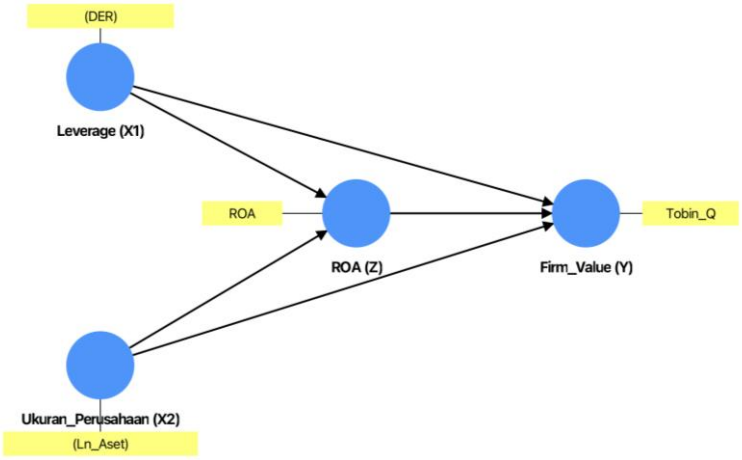
The descriptive statistics show that the Debt to Equity Ratio (DER) has a mean value of 0.385 with a minimum value of 0.114 by PT. Vale Indonesia Tbk. (INCO) in 2022 and a maximum value of 1.584 by PT. Ifishdeco Tbk. (IFSH) in 2022, indicating that the leverage level among the mining companies varies moderately. The Firm Size (Ln_Asset) variable has an average value of 30.513 with values ranging from 26.010 by PT. Ifishdeco Tbk. (IFSH) in 2022 to 32.758 by PT. Alamtri Resources Indonesia Tbk. (ADRO) in 2022, suggesting differences in company size within the sample. Meanwhile, Return on Assets (ROA) has a mean value of 0.155, with a minimum value of -0.165 by PT. Wilton Makmur Indonesia Tbk. (SQMI) in 2022 and a maximum value of 0.616 by PT. Golden Energy Mines Tbk. (GEMS) in 2022, indicating that some companies experienced negative profitability during the observation period.

Furthermore, Firm Value (Tobin's Q) shows an average value of 1.390 with a minimum value of 0.115 by PT. Vale Indonesia Tbk. (INCO) in 2022 and a maximum value of 12.944 by PT. Bayan Resources Tbk. (BYAN) in 2023. This indicates a considerable variation in firm value among mining companies listed on the Indonesia Stock Exchange. The normality test results using the Cramér–von Mises test show that all variables have p-values below 0.05, indicating that the data are not normally distributed. However, in the Partial Least Squares–Structural Equation Modeling (PLS-SEM) approach used in this study, normality assumptions are not strictly required, allowing the analysis to proceed despite the non-normal distribution of the data.

Outer Model Analysis

The outer model analysis is conducted to determine and ensure that the measurements used are suitable for measurement purposes (validity and reliability). The outer model also serves as a model capable of explaining the relationship between latent variables and their indicators. It is used to test the construct validity and instrument reliability of the variables under study (Nazariah et al., 2021).

Figure 1. Struktural Model



Source: Output SmartPLS version 4.0 (2026)

Based on the presentation of Figure 1, the indicators with latent constructs show that this study uses reflective indicators, because all indicators move in the same direction, meaning that a change in one indicator causes changes in the other indicators. The relationships among the constructs indicate the relationships to be examined in this study (hypotheses).

Convergent Validity

Convergent validity is conducted to examine the loading factor values of each construct. In testing convergent validity, the measurements used are outer loading and Average Variance Extracted (AVE). If the AVE value of each variable is greater than 0.5 and the outer loading value is greater than 0.7, it indicates that there are no convergent validity problems in the tested research model (Nanang & Hendang, 2019).

Table 5. Outer Loadings - Matrix

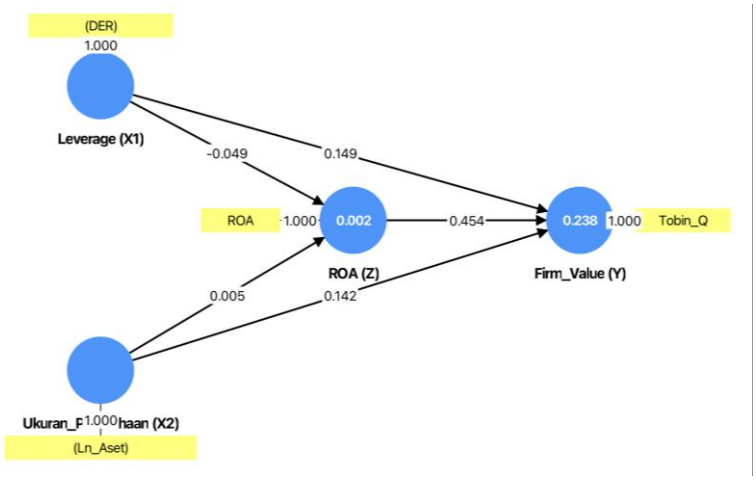
	Firm_Value (Y)	Leverage (X1)	ROA (Z)	Ukuran_Perusahaan (X2)
(DER)		1.000		
(Ln_Aset)				1.000
ROA			1.000	
Tobin_Q	1.000			

Source: Output SmartPLS version 4.0 (2026)

Based on the presentation of Table 5, it shows that all construct indicators have outer loading values is greater than 0.7. The indicators of all constructs have an outer loading value of 1.000, indicating that all indicators are valid and meet the requirements of convergent

validity. The following is the diagram of the loading factor values for each indicator in the research model.

Figure 2. Model Loading Factor



Source: Output SmartPLS version 4.0 (2026)

Based on the presentation of Figure 2, it illustrates the relationship between the indicators and their latent variables.

Discriminant Validity

Discriminant validity is a measurement used to assess the indicators of latent variables. The value of the intended construct must be higher than the loading factor values on other constructs. Discriminant validity can be tested by examining the values in the cross-loading table to ensure that each construct has adequate discriminant validity (Nanang & Hendang, 2019). Discriminant validity based on cross loading is measured by comparing the loading values of each indicator on its respective construct with those on other constructs.

Table 6. Cross Loading Value

	Firm_Value (Y)	Leverage (X1)	ROA (Z)	Ukuran_Perusahaan (X2)
Firm_Value (Y)	1.000	0.109	0.448	0.129
Leverage (X1)	0.109	1.000	-0.049	-0.124
ROA (Z)	0.448	-0.049	1.000	0.011
Ukuran_Perusahaan (X2)	0.129	-0.124	0.011	1.000

Source: Output SmartPLS version 4.0 (2026)

Based on the results shown in the table 6, it can be concluded that all constructs in the research model meet the discriminant validity requirement, indicating that each construct is empirically distinct and able to explain its respective indicators better than other constructs in the model.

Reliability Test

In this study, a reliability test is not required because each construct is measured using a single indicator derived from secondary data, such as financial ratios. Reliability tests such as Composite Reliability and Cronbach's Alpha are generally applied when a construct is measured using multiple indicators, typically obtained from questionnaire-based data.

Since each variable in this study (Firm Value, Leverage, Profitability, and Firm Size) is represented by only one indicator, the reliability test cannot be meaningfully calculated. Therefore, the reliability assessment is not conducted in this research model.

Inner Model Analysis

The inner model or structural model is a model capable of describing the relationships between independent latent variables and dependent latent variables. The inner model also aims to test the ability of exogenous constructs to explain the variation in endogenous constructs. Furthermore, the inner model can function to indicate the level of significance in hypothesis testing (Helfin & Trisnawati, 2020).

R Square (R^2)

R-square testing is used to measure a model's ability to explain the variations in the data. In this study, the adjusted R^2 is applied. R-square also serves to assess the capability of the independent variables in explaining the variance of the dependent variable. A high R-square value is considered favorable for the predictive power of the research model.

Table 7. R-Square and R Square Adjusted

	R-square	R-square adjusted
Firm_Value (Y)	0.238	0.205
ROA (Z)	0.002	-0.026

Source: Output SmartPLS version 4.0 (2026)

Based on the Table 7 above, for Firm Value (Y) the R-square is 0.238 and the adjusted R-square is 0.205. This means that the independent variables in the model can explain only about 23.8% of the variation in Firm Value, while the remaining 76.2% is explained by other factors outside the model. After adjusting for the number of variables and sample size, the explanatory power decreases slightly to 20.5%, leaving 79.5% of the variation unexplained. This indicates that the model's ability to predict Firm Value is limited. For ROA (Z), the R-square is 0.002 and the adjusted R-square is -0.026. This implies that the independent variables explain only 0.2% of the variation in ROA, with the remaining 99.8% unexplained. The negative adjusted R-square further indicates that the model performs worse than simply using the mean value of ROA as a predictor, showing that the model is ineffective for predicting ROA.

Effect Size (F^2)

The effect size (f^2) measures the contribution of each independent variable to the explained variance of the dependent variable. According to Cohen's (1988) guidelines, an f^2 value of 0.02 is considered small, 0.15 is medium, and 0.35 is large (Gultom & Tartila, 2022).

Table 8. Effect Size

	Firm_Value (Y)	Leverage (X1)	ROA (Z)	Ukuran_Perusahaan (X2)
Firm_Value (Y)				
Leverage (X1)	0.029		0.002	
ROA (Z)	0.269			
Ukuran_Perusahaan (X2)	0.026		0.000	

Source: Output SmartPLS version 4.0 (2026)

Based on the Table 8, Leverage (X1) has a small effect on Firm Value (Y) (f^2 = 0.029), while Firm Size also shows a small contribution (f^2 = 0.026). In contrast, ROA (Z) has a medium to large effect on Firm Value (f^2 = 0.269), indicating it is the most influential factor among the variables studied. Regarding ROA (Z) as the dependent variable, both Leverage (X1) (f^2 = 0.002) and Firm Size (f^2 = 0.000) have negligible effects, suggesting that these variables contribute very little to explaining ROA. Overall, ROA plays the strongest role in predicting Firm Value, while leverage and firm size have only minor or minimal contributions.

Goodness of Fit (GoF) Test

The goodness-of-fit or model fit can be assessed using the SRMR (Standardized Root Mean Square Residual). A model is considered to meet the goodness-of-fit criteria if the SRMR value is less than 0.10 (Ghazali et al., 2018).

Table 9. Model Fit

	Saturated model	Estimated model
SRMR	0.000	0.000

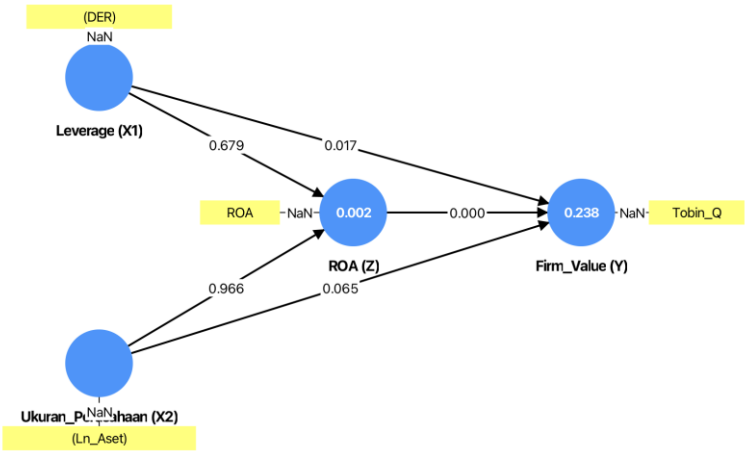
Source: Output SmartPLS version 4.0 (2026)

The Standardized Root Mean Square Residual (SRMR) measures the average discrepancy between the observed correlations and the model-implied correlations. For both the saturated model and the estimated model, the SRMR values are 0.000, indicating a perfect fit. This means that the model reproduces the observed correlation matrix almost exactly, with no residual differences.

Hypothesis Test

Hypothesis testing is used to evaluate the research results against the objectives set by the researcher. In this study, hypothesis testing is conducted using Path Coefficients. The results from SmartPLS for assessing the path coefficients can be seen in Figure 3 below:

Figure 3. Model Struktural



Source: Output SmartPLS version 4.0 (2026)

Table 10. Path Coefficient – Specific Direct Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Leverage (X1) -> Firm_Value (Y)	0.149	0.160	0.062	2.389	0.017
Leverage (X1) -> ROA (Z)	-0.049	-0.047	0.118	0.414	0.679
ROA (Z) -> Firm_Value (Y)	0.454	0.463	0.085	5.353	0.000
Ukuran_Perusahaan (X2) -> Firm...	0.142	0.130	0.077	1.846	0.065
Ukuran_Perusahaan (X2) -> ROA...	0.005	0.007	0.110	0.043	0.966

Source: Output SmartPLS version 4.0 (2026)

Based on Table 10 above, the statistical test shows the values obtained in the direct effect test, which can be described as follows:

1) Hypothesis 1 (H_1) test results: The relationship between Leverage (X1) and Firm Value (Y) has a p-value of 0.017 < 0.05, so H_0 is rejected and H_1 is accepted. The path coefficient (original sample) is 0.149 and positive, indicating a positive effect: when Leverage (X1) increases, Firm Value (Y) also increases, and vice versa. Therefore, it can be concluded that Leverage (X1) has a positive and significant effect on Firm Value (Y).

2) Hypothesis 2 (H_2) test results: The relationship between Firm Size (X2) and Firm Value (Y) shows a path coefficient (original sample) of 0.142 with a p-value of 0.065. Since the p-value > 0.05, H_0 is not rejected and H_2 is not supported. The positive path coefficient indicates a positive influence, meaning that an increase in Firm Size tends to increase Firm Value, but this effect is not statistically significant. Therefore, it can be concluded that Firm Size (X2) has no significant effect on Firm Value (Y).

3) Hypothesis 3 (H_3) test results: The effect of ROA (Z) on Firm Value (Y) has a path coefficient (original sample) of 0.454 with a p-value of 0.000. Since the p-value < 0.05, H_0 is rejected and H_3 is supported. The positive coefficient indicates that an increase in ROA leads to an increase in Firm Value. Thus, ROA (Z) has a positive and significant effect on Firm Value (Y).

4) Hypothesis 4 (H_4) test results: The relationship between Leverage (X1) and ROA (Z) shows a path coefficient (original sample) of -0.049 with a p-

value of 0.679. Since the p-value > 0.05, H_0 is not rejected and H_4 is not supported. The negative coefficient suggests a negative influence, but this effect is not statistically significant. Therefore, Leverage (X1) has no significant effect on ROA (Z).

5) Hypothesis 5 (H_5) test results**:** The effect of Firm Size (X2) on ROA (Z) has a path coefficient (original sample) of 0.005 with a p-value of 0.966. Since the p-value > 0.05, H0 is not rejected and H_5 is not supported. The coefficient is very close to zero, indicating that Firm Size (X2) has no significant effect on ROA (Z).

Table 11. Path Coefficient – Specific Indirect Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Ukuran_Perusahaan (X2) -> ROA (Z) -> Firm_Value (Y)	0.002	0.004	0.052	0.041	0.967
Leverage (X1) -> ROA (Z) -> Firm_Value (Y)	-0.022	-0.021	0.056	0.397	0.691

Source: Output SmartPLS version 4.0 (2026)

Based on Tabel 11 above, the statistical test shows the values obtained in the indirect effect test, which can be described as follows:

1) Hypothesis 6 (H_6) test results: The indirect effect of Leverage (X1) → ROA (Z) → Firm Value (Y) shows a p-value of 0.691 and an original sample path coefficient of -0.022. Since the p-value > 0.05, this indirect effect is not statistically significant, indicating that ROA does not mediate the relationship between Leverage and Firm Value.

2) Hypothesis 7 (H_7) test results: The indirect effect of Firm Size (X2) → ROA (Z) → Firm Value (Y) has a p-value of 0.967 and an original sample path coefficient of 0.002. With a p-value > 0.05, this effect is also not statistically significant**,** meaning that ROA does not serve as a mediator between Firm Size and Firm Value.

The test results show that Leverage (X1) positively and significantly affects Firm Value (Y), with a path coefficient of 0.149 and a p-value of 0.017 < 0.05. According to the Trade-Off Theory, optimal use of debt can increase firm value by providing tax benefits while balancing financial risk. This aligns with the argument that mining companies with well-managed leverage can signal financial strength to investors, thus increasing their stock valuation, as reflected in Tobin's Q. Previous studies also support this result, showing a positive effect of leverage on firm value (Adelia et al., 2024; Dewi & Abundanti, 2019).

The path coefficient for Firm Size (X2) → Firm Value (Y) is 0.142 with a p-value of 0.065 > 0.05, indicating a positive but not statistically significant effect. According to Signaling Theory, larger firms are expected to provide positive signals to investors about their stability and resource capacity, potentially increasing firm value. However, in the mining sector, firm size alone may not be sufficient to significantly influence market perception, consistent with studies reporting insignificant effects of firm size on firm value (Annisya et al., 2025; Puri et al., 2024).

ROA (Z) significantly influences Firm Value (Y), with a path coefficient of 0.454 and a p-value of 0.000 < 0.05, indicating a strong positive effect. Profitability reflects the company's

efficiency in generating returns from its assets, which enhances investor confidence. This finding is consistent with prior research showing that profitability positively affects firm value (Annisya et al., 2025; Putri et al., 2024). The result also aligns with theoretical expectations that firms with higher ROA are perceived as capable of sustainable growth and value creation.

The results show a path coefficient of -0.049 and a p-value of 0.679 > 0.05, indicating no significant effect. While leverage can theoretically increase returns through financial leverage, excessive debt may raise financial costs, reducing profitability (Trade-Off Theory). In the Indonesian mining context, this result suggests that leverage levels do not substantially impact ROA, aligning with studies reporting insignificant leverage effects on profitability (Fadhillah et al., 2024; Fajri et al., 2023).

The path coefficient is 0.005 with a p-value of 0.966 > 0.05, indicating no significant effect of firm size on ROA. Although larger firms are expected to benefit from economies of scale and better resource management (Signaling Theory), the result shows that size alone does not guarantee higher profitability in mining companies. This aligns with studies reporting that firm size may not significantly affect profitability in capital-intensive sectors (Fajri et al., 2023; Puri et al., 2024).

The indirect effect shows a path coefficient of 0.002 and a p-value of 0.967 > 0.05, indicating that ROA does not mediate the effect of leverage on firm value. While leverage can theoretically affect firm value through improved profitability, the insignificance of X1 → ROA means the mediating path is negligible. This is consistent with previous findings in mining companies showing weak mediation effects of profitability (Fajri et al., 2023; Radja et al., 2025).

The path coefficient for the indirect effect is -0.022 with a p-value of 0.691 > 0.05, indicating that ROA does not mediate the relationship between firm size and firm value. Although theoretically, larger firms are expected to generate higher profitability that can increase firm value (Signaling Theory), the empirical result shows this mediation is not significant. This finding aligns with research indicating that firm size may only weakly influence firm value through profitability in mining sectors (Adelia et al., 2024; Dewi & Abundanti, 2019).

CONCLUSION

This study aims to examine the effect of leverage and firm size on firm value and to analyze the role of profitability as an intervening variable in mining companies listed on the Indonesia Stock Exchange. The results demonstrate that leverage has a positive and significant effect on firm value, while profitability plays a crucial role in enhancing firm value. Firm size shows a positive but not statistically significant effect, and neither leverage nor firm size significantly affects profitability. In addition, profitability does not mediate the relationship between leverage, firm size, and firm value. These findings highlight the importance of effective financial management, particularly in optimizing leverage and improving profitability, to enhance firm value and investor confidence. This study has several limitations. First, it focuses only on mining companies, which may limit the generalizability of the findings to other sectors. Second, the study period is relatively short, covering only

2022–2024. Third, the variables used are limited to leverage, firm size, and profitability, without considering other potential factors such as corporate governance, market volatility, and environmental regulations. For future research, it is recommended to include additional internal and external variables, extend the observation period, and expand the scope to other sectors to provide a more comprehensive understanding of the determinants of firm value in Indonesia.

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