International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

The Effect Of Profitability On Firm Value: The Moderating Role Of ESG Score In The Indonesian Mining Sector

Intan[1], Fatih Cahyadinata[1], Azelia Cassanova[1], Dinda Sulissoviani[1], Dina Alyana[1], Reyval Dimas Arya Lingga[1], Chairil Afandy[2]

[1)]Student,Department of Management, Faculty of Economics and Business, Universitas Bengkulu, Indonesia
[2)]Lecture, Department of Management, Faculty of Economics and Business, Universitas Bengkulu, Indonesia

Correspondence E-mail: * intansalamun8@gmail.com

Abstract

This study investigates the effect of profitability on firm value and evaluates the moderating role of Environmental, Social, and Governance (ESG) score in the Indonesian mining sector. ESG score is measured using the Katadata ESG Index (KESGI). Analyzing panel data from mining companies listed on the Indonesia Stock Exchange over the 2021–2024 period, the research employs Moderated Regression Analysis (MRA) with a Random Effect Model, controlling for Firm Size and Leverage. The results show that profitability and ESG score significantly and positively influence firm value. However, ESG score fails to moderate the relationship between profitability and firm value. Driven by the 2021–2024 global commodity supercycle, market participants prioritized short-term windfall profits over sustainability metrics, preventing ESG from acting as a value multiplier for corporate profitability.

Keywords: Profitability, Return on Assets, Firm Value, Tobin's Q, ESG score

INTRODUCTION

In recent years, corporate sustainability and governance have become essential benchmarks for evaluating how companies manage long term risks and operational impacts (Sachs et al., 2025). Developing countries like Indonesia still face significant challenges in meeting Sustainable Development Goals, ranking 77th globally with a score of 70.2, which falls behind regional peers such as Thailand and Vietnam (Sachs et al., 2025). To accelerate progress, the corporate sector plays a key role, particularly through regulatory frameworks such as Financial Services Authority Regulation POJK Number 51 year 2017, which requires listed entities to publish annual sustainability reports.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

The mining sector serves as a crucial economic backbone in Indonesia, yet it inherently carries high ecological risks, generating over 60 percent of national hazardous waste and causing substantial land transformation (Environesia, 2025). To understand how capital markets evaluate firms operating under such environmental exposure, Signaling Theory provides a solid theoretical foundation (Spence, 1973). Grounded in the concept of information asymmetry between corporate managers and external investors, Signaling Theory suggests that financial metrics serve as essential signals transmitted by management to demonstrate operational efficiency (Akerlof, 1970). Profitability, measured by Return on Assets, acts as a primary signal reflecting how effectively management uses total assets to generate net earnings (Brigham & Houston, 2018) . A high Return on Assets sends a positive signal to the market, building investor confidence and elevating firm value measured by Tobin's Q (Yusra & Sulistyowati, 2023).

However, in environmentally sensitive industries like mining, strong financial returns alone might not fully reassure investors who worry about hidden ecological liabilities (Naeem et al., 2022) . Under Signaling Theory, independent non financial ratings such as the Katadata ESG Index score, referred to as ESG Score, can function as a reinforcing signal (Aydoğmuş et al., 2022). When a profitable mining firm also demonstrates a strong ESG Score, it reassures the market that its profits are sustainable and backed by responsible practices (Kirana et al., 2026). Conversely, during periods of high commodity prices, investors might view extensive sustainability expenses as immediate cost burdens that eat into short term cash flows rather than adding value (Dogan et al., 2026).

To address this debate, this study examines the impact of profitability on firm value and tests whether the ESG Score acts as a moderating signal for listed Indonesian mining companies over the 2021 to 2024 period. By analyzing 19 mining firms with 76 total observations while controlling for Firm Size and Debt to Equity Ratio, this paper aims to provide clearer empirical evidence on how financial and non financial signals interact in extractive industries.

LITERATURE REVIEW

The Influence of Profitability on Firm Value

Under the framework of Signaling Theory, severe information asymmetry exists between internal corporate management and external capital market investors regarding true operational performance and future asset prospects (Spence, 1973). To bridge this information gap, corporate executives transmit verifiable signals through published financial statements (Brigham & Houston, 2018). Profitability, measured by Return on Assets, serves as a primary financial signal demonstrating management's operational efficiency in transforming corporate assets into net earnings (Kasmir, 2019). High

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

profitability signals to the market that a firm possesses strong competitive advantages, operational resilience, and robust future cash flow generation capacity (Yusra & Sulistyowati, 2023). External investors interpret this positive financial signal as a guarantee of earnings stability, reducing perceived investment risk and encouraging market participants to bid up corporate stock prices, thereby elevating firm value measured by Tobin's Q (Setiawanta et al., 2021). Therefore, Signaling Theory explains that higher profitability directly strengthens firm valuation premiums.

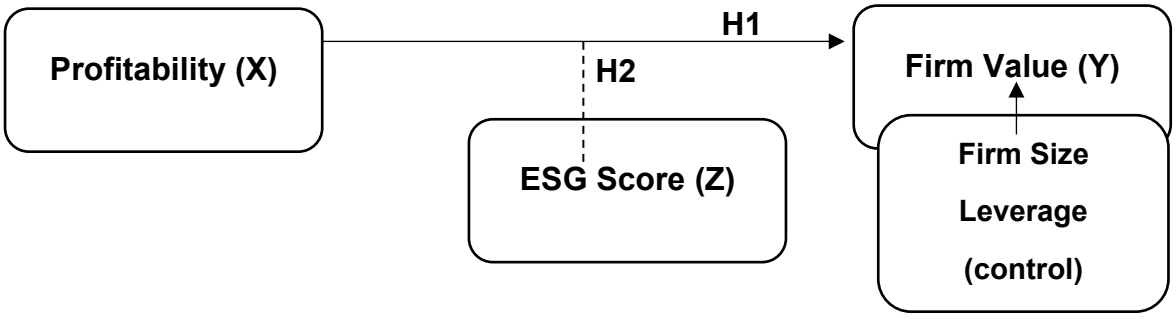
H1: Profitability has a positive effect on Firm Value in mining companies listed on the Indonesia Stock Exchange for the 2021 to 2024 period.

The Moderating Role of ESG Score

In environmentally sensitive industries such as mining, high financial returns alone may raise investor concerns regarding hidden ecological liabilities, community conflicts, and impending regulatory penalties (Lokuwaduge & Heenetigala, 2017; Naeem et al., 2022). Signaling Theory posits that non financial scores, captured by the Katadata ESG Index score, function as secondary supplementary signals that validate corporate long term sustainability (Aydoğmuş et al., 2022;Oehler & Neuss, 2025). When a highly profitable mining enterprise simultaneously displays a strong ESG score, market participants receive a compound positive signal confirming that current profits are generated through responsible environmental management rather than ecological exploitation (Chen et al., 2024;Kirana et al., 2026). This secondary signal is hypothesized to reinforce investor confidence, lowering cost of capital and amplifying the positive impact of Return on Assets on Tobin's Q. Conversely, if market actors view ESG reporting as an administrative cost burden during commodity booms, the moderating signal may diminish (Dogan et al., 2026;Fikru et al., 2024).

H2: ESG Score moderates the positive effect of Profitability on Firm Value in mining companies listed on the Indonesia Stock Exchange for the 2021 to 2024 period.

Conceptual Framework



Picture 1. Conceptual Framework
Source: Processed by Authors (2026)

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

METHOD STUDY

Method, Population, And Sample Study

This study uses a quantitative approach with an associative causal design to examine the relationships among variables empirically (Sugiyono, 2019). The population consists of all mining companies listed on the Indonesia Stock Exchange during the 2021 to 2024 period. Sample selection applies a purposive sampling method based on specific criteria to meet the research objectives (Sugiyono, 2019). The criteria require companies to be active on the exchange continuously from 2021 to 2024, publish audited annual financial reports, and have complete ESG score data published in the Katadata ESG Index. After screening and removing extreme outliers, 19 mining companies met all requirements, yielding 76 balanced panel data observations over four years.

Table 1. Sampling Criteria

Information	Amount
Population: Mining sector companies listed on IDX 2021 to 2024 period	39
Incomplete annual reports or financial statements during 2021 to 2024	(4)
Companies without Katadata ESG Index scores during 2021 to 2024	(11)
Extreme outlier companies eliminated	(5)
Total sample companies obtained	19
Total observations (19 companies x 4 years)	76

Based on the purposive sampling process applied to all mining entities listed on the Indonesia Stock Exchange, a total of 19 companies successfully fulfilled all predetermined selection criteria consistently across the four year observation period from 2021 to 2024. The complete list of sample companies along with their respective stock ticker codes and industry classifications is presented in Table 2 below.

Table 2. List of sample companies

No	Ticker Code	Company Name	Sub Sector / Industry
1	ADRO	Adaro Energy Indonesia Tbk.	Coal Mining
2	ANTM	Aneka Tambang Tbk.	Metals & Minerals Mining
3	ARCI	Archi Indonesia Tbk.	Gold & Precious Metals Mining
4	BSSR	Baramulti Suksessarana Tbk.	Coal Mining
5	BUMI	Bumi Resources Tbk.	Coal Mining
6	BRMS	Bumi Resources Minerals Tbk.	Metals & Minerals Mining
7	CITA	Cita Mineral Investindo Tbk.	Bauxite Mining
8	DSSA	Dian Swastatika Sentosa Tbk.	Energy & Coal Mining
9	GEMS	Golden Energy Mines Tbk.	Coal Mining

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

10	HRUM	Harum Energy Tbk.	Energy & Mining
11	INCO	Vale Indonesia Tbk.	Nickel Mining
12	INDY	Indika Energy Tbk.	Energy & Coal Mining
13	ITMG	Indo Tambangraya Megah Tbk.	Coal Mining
14	KKGI	Resource Alam Indonesia Tbk.	Coal Mining
15	MBAP	Mitrabara Adiperdana Tbk.	Coal Mining
16	MCOL	Prima Andalan Mandiri Tbk.	Coal Mining
17	MYOH	Samindo Resources Tbk.	Mining Services & Coal
18	PTBA	Bukit Asam Tbk.	Coal Mining
19	TOBA	TBS Energi Utama Tbk.	Energy & Mining

Based on the sampling criteria process, 19 mining companies listed on the Indonesia Stock Exchange met all requirements across the 2021 to 2024 observation period. With 4 observation years for each entity, the final balanced panel dataset consists of 76 total observations.

Definition Operational Variables

The variables analyzed in this study are operationalized in the table below to ensure accurate measurement across all observations (Brigham & Houston, 2018).

Table 3. Definition Operational Variables

No	Variables	Definition	Formula	Scale
1	Firm Value (Y)	Measured by Tobin's Q, reflecting market appreciation of total corporate assets (Tobin, 1969)	$\frac{(\text{CP x Shares}) + \text{Debt}}{\text{Total Asset}}$	Ratio
2	Profitability (X)	Measured by Return on Assets, showing managerial efficiency in generating net income from assets (Waddock & Graves, 1997)	$\frac{\text{Net Income}}{\text{Total Asset}}$	Ratio
3	ESG Score (Z)	Measured by Katadata ESG Index scores, representing non financial sustainability performance	ESG Score from Katadata Index published scale 0 to 100	Ratio
4	Firm Size (Control)	Measured by log of total assets, controlling for firm	$\text{Size} = \text{Ln}(\text{Total Asset})$	Ratio

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

		scale and operational capacity (Afiezan et al., 2022)		
5	Leverage (Control)	Measured by Debt to Equity Ratio, controlling for capital structure and debt risk (Aydoğmuş et al., 2022; Arhinful & Radmehr, 2023)	$\frac{\text{Total debt}}{\text{Total equity}}$	Ratio

Type And Source Data

This study uses secondary quantitative data combining cross section units of mining firms and time series observations from 2021 to 2024. The financial statements and annual reports are collected from the official website of the Indonesia Stock Exchange at www.idx.co.id. The sustainability score scores are collected from official publications of the Katadata ESG Index. Data collection uses documentation techniques by recording and compiling secondary numerical reports (Sugiyono, 2019).

Model Analysis Study

The data analysis uses Moderated Regression Analysis on panel data managed through EViews software (Hair et al., 2019). Three model selection tests determine the optimal panel estimator, including the Chow test comparing Common Effect and Fixed Effect, the Hausman test comparing Fixed Effect and Random Effect, and the Lagrange Multiplier test comparing Common Effect and Random Effect (Widarjono, 2018).The econometric regression equation is formulated as follows:

$$Y = \alpha + \beta_1 X + \beta_2 Z + \beta_3 (X \times Z) + \beta_4 C_1 + \beta_5 C_2 + \varepsilon$$

Where Y is Tobin's Q, α is the constant, X is Return on Assets, Z is ESG Score, $(X \times Z)$ is the interaction term, C_1 is Firm Size, C_2 is Debt to Equity Ratio, and ε represents the error term.

RESULTS AND DISCUSSION

Results

Regression Model Goodness of Fit Test

Selecting the most appropriate panel estimation model among Common Effect Model, Fixed Effect Model, and Random Effect Model is essential to obtain efficient and unbiased parameters (Widarjono, 2018).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 4. Panel Model Selection Specification Test Results

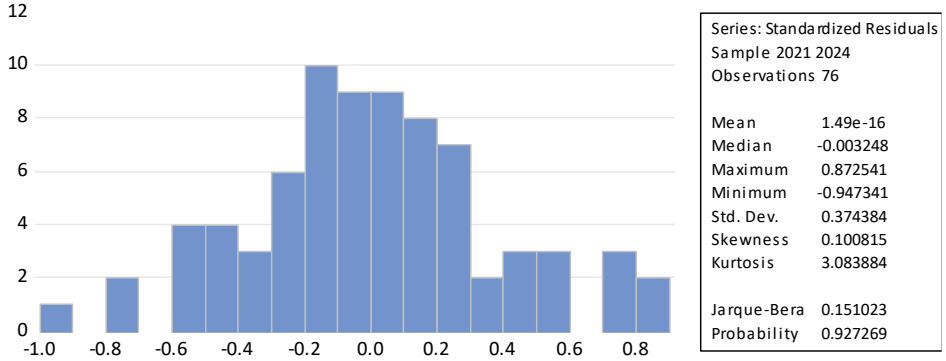
Test Method	Statistic Value	Degrees of Freedom / Test	Probability Value	Selected Estimator
Chow Test	Cross section F 8.3711	18, 52	0.0000	Fixed Effect Model
Hausman Test	Chi Square 4.2826	5	0.5095	Random Effect Model
Lagrange Multiplier Test	Breusch Pagan 43.4893	Cross section	0.0000	Random Effect Model

Source: Eviews Output Results (Data processed 2026)

To select the optimal panel estimator among Common Effect Model, Fixed Effect Model, and Random Effect Model, model specification tests were sequentially conducted (Widarjono, 2018). The Chow test yields a Cross section F statistic of 8.3711 with degrees of freedom 18 and 52 alongside a probability value of 0.0000, preferring the Fixed Effect Model over the Common Effect Model. Subsequently, the Hausman test comparing the Fixed Effect Model against the Random Effect Model produces a Chi Square statistic of 4.2826 with 5 degrees of freedom and a probability value of 0.5095, confirming that the Random Effect Model is statistically superior. Finally, the Lagrange Multiplier test yields a Breusch Pagan Cross section statistic of 43.4893 with a probability value of 0.0000, further validating the Random Effect Model as the optimal empirical estimator for the moderated regression analysis.

Normality Test

The normality test evaluates whether regression residuals follow a normal distribution around a zero mean to ensure unbiased parameter estimates, utilizing histogram visualization and the Jarque Bera statistical test (Widarjono, 2018).



Picture 2. Normality Test Histogram Result

Source: Eviews Output Results (Data processed 2026)

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Based on the normality test output shown in Picture 2, the Jarque Bera statistic yields 0.1510 with a probability value of 0.9273. Since the probability exceeds the 0.05 threshold, the standardized residuals are confirmed to be normally distributed. This is further supported by a skewness value of 0.1008 near zero and a kurtosis value of 3.0839 close to three, proving that the model satisfies the classical normality assumption (Widarjono, 2018).

Multicollinearity Test

The multicollinearity test evaluates whether strong linear relationships exist among explanatory variables using a correlation matrix, where coefficients must remain below the 0.80 threshold to prevent inflated standard errors and parameter distortion (Hair et al., 2019).

Table 5. Multicollinearity Test Results

	TOBIN	ROAA	ESGSCORE	MODERATION	FIRMSIZE	DER
TOBIN	1.000000	0.462033	0.086160	0.169564	-0.435898	-0.143715
ROAA	0.462033	1.000000	0.047294	0.233866	-0.205960	-0.155269
ESGS...	0.086160	0.047294	1.000000	0.040341	0.203348	0.115190
MODE...	0.169564	0.233866	0.040341	1.000000	-0.146606	-0.038820
FIRMSIZE	-0.435898	-0.205960	0.203348	-0.146606	1.000000	0.210753
DER	-0.143715	-0.155269	0.115190	-0.038820	0.210753	1.000000

Source: Eviews Output Results (Data processed 2026)

All correlation coefficients in Table 5 remain well below the 0.80 threshold, peaking at 0.2339 between Return on Assets and the moderation term, confirming that mean centering effectively eliminated multicollinearity issues (Hair et al., 2019).

Heteroskedasticity Test

The heteroskedasticity test examines whether unequal variance exists across residual observations in the regression model (Hair et al., 2019). A robust regression model requires homoscedasticity, where the variance of error terms remains constant across all cross section units and time periods. In this study, heteroskedasticity is evaluated using the Glejser test by regressing absolute standardized residuals against all explanatory variabel.

Table 6. Heteroskedasticity Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.031281	0.813299	1.268022	0.2090
ROAA	-0.096093	0.189279	-0.507681	0.6133
ESGSCORE	-0.000160	0.002980	-0.053656	0.9574
MODERATION	0.018822	0.019759	0.952607	0.3441
FIRMSIZE	-0.023856	0.026744	-0.892007	0.3754
DER	-0.024476	0.035757	-0.684522	0.4959

Source: Eviews Output Results (Data processed 2026)

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Based on the Glejser test results presented in Table 6, all explanatory variables obtain probability significance values well above the 0.05 threshold. Specifically, Return on Assets yields a probability of 0.6133, ESG Score records 0.9574, the moderation interaction term shows 0.3441, Firm Size displays 0.3754, and Debt to Equity Ratio records 0.4959. Since no explanatory variable significantly affects the absolute residuals at the 5 percent level, the regression model is confirmed to be free from heteroskedasticity issues.

Autocorrelation Test

The autocorrelation test assesses whether error terms in period t are correlated with error terms from the preceding period t minus 1 in a panel regression model (Hair et al., 2019) . A valid empirical regression model requires disturbance terms to be serial correlation free to ensure efficient parameter estimates and reliable standard errors (Widarjono, 2018). The autocorrelation evaluation relies on the Durbin Watson statistic compared against lower dL and upper dU critical bounds at a 5 percent significance level for a sample size of 76 with 5 regressors.

Table 7. Autocorrelation Test Durbin Watson Result

R-squared	0.356230	Mean dependent var	0.266678
Adjusted R-squared	0.310247	S.D. dependent var	0.466608
S.E. of regression	0.387525	Akaike info criterion	1.017582
Sum squared resid	10.51228	Schwarz criterion	1.201588
Log likelihood	-32.66813	Hannan-Quinn criter.	1.091120
F-statistic	7.746907	Durbin-Watson stat	0.506745
Prob(F-statistic)	0.000008		

Source: Eviews Output Results (Data processed 2026)

Based on the autocorrelation test output presented in Table 8, the Durbin Watson statistic records a value of 0.5067. In panel data analysis combining cross section and time series dimensions, low baseline Durbin Watson statistics are frequently observed due to individual company heterogeneity across time. To ensure robust statistical inference, standard errors are evaluated alongside generalized least squares procedures designed for balanced panel structures.

Descriptive Statistics

Descriptive statistics provide a general overview of the data characteristics for all variables analyzed in this study (Sugiyono, 2019). The sample consists of 19 listed mining companies observed over a four year period from 2021 to 2024, resulting in 76 total observations. The statistical summary presenting the sample size, mean, standard deviation, minimum, and maximum values for Firm Value (Tobin's Q), Profitability (ROA), ESG Score (KESGI), Firm Size, and Leverage (DER) is shown in Table 8 below.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 8. Descriptive Statistics Results

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Tobin's Q (Y)	76	0.4537	4.5717	1.4581	0.7429
ROA (X)	76	0.0064	0.6163	0.1792	0.1559
ESG Score (Z)	76	35.9700	81.5800	61.2105	9.6584
Firm Size (Control)	76	28.2655	32.7645	30.5273	1.1148
DER (Control)	76	0.0423	5.5339	0.7072	0.8072

Source: Eviews Output Results (Data processed 2026)

The descriptive statistics presented in Table 8 reveal crucial qualitative insights into the financial and operational characteristics of the Indonesian mining sector from 2021 to 2024. The average Tobin's Q value exceeding unity reflects overall capital market optimism, demonstrating that investors consistently value listed mining entities above the replacement cost of their physical assets due to strong global mineral demand (Tobin, 1969; Arhinful & Radmehr, 2023). The wide dispersion in Return on Assets highlights significant operational efficiency gaps across commodity cycles, separating low cost extractive leaders from margin constrained operators (Kasmir, 2019; Fu et al., 2024). Furthermore, the moderate to high average ESG Score indicates that Indonesian mining firms actively maintain sustainability scores to satisfy regulatory mandates under POJK Number 51 year 2017 and mitigate environmental scrutiny (Oehler & Neuss, 2025). Finally, the narrow standard deviation in Firm Size demonstrates asset scale stability, while a low average Debt to Equity Ratio confirms that mining corporations maintain conservative capital structures, relying primarily on equity and operational cash flows to hedge against volatile commodity price swings (Afiezan et al., 2022; Arhinful & Radmehr, 2023).

Hypothesis Testing

Multiple Linear Regression Analysis

Because the Random Effect Model was selected through specification tests, Moderated Regression Analysis is estimated using Panel Generalized Least Squares with cross section random effects (Widarjono, 2018). This empirical model evaluates the direct effect of Return on Assets on Firm Value, the moderating role of ESG Score, and the control effects of Firm Size and Debt to Equity Ratio. The empirical output derived from EViews estimation is presented in Table 9 below.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 9. Regression Test Result

Dependent Variable: TOBIN
Method: Panel EGLS (Cross-section random effects)
Date: 10/16/26 Time: 18:24
Sample: 2021 2024
Periods included: 4
Cross-sections included: 19
Total panel (balanced) observations: 76
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.391506	2.102399	3.515748	0.0008
ROAA	0.816496	0.294604	2.771502	0.0071
ESGSCORE	0.006627	0.003313	2.000306	0.0493
MODERATION	0.005057	0.019639	0.257494	0.7976
FIRMSIZE	-0.233504	0.068869	-3.390544	0.0011
DER	0.004317	0.046845	0.092161	0.9268

Source: Eviews Output Results (Data processed 2026)

The regression equation constant of 7.3915 indicates that when all independent, moderating, and control variables are held at zero, the logarithmic value of Tobin's Q equals 7.3915. Profitability measured by Return on Assets demonstrates a positive coefficient of 0.8165, meaning that every one unit increase in Return on Assets increases Tobin's Q by 0.8165 units, holding other variables constant. Additionally, ESG Score shows a positive coefficient of 0.0066, reflecting a statistically significant direct positive association with firm valuation. Meanwhile, the moderation interaction term between Return on Assets and ESG Score records a slight positive coefficient of 0.0051, which remains statistically insignificant.

For the control variables, Firm Size exhibits a negative coefficient of -0.2335, demonstrating that an expansion in total asset scale leads to a lower Tobin's Q ratio among listed mining entities. In contrast, Leverage measured by Debt to Equity Ratio records a minor positive coefficient of 0.0043, indicating a slight positive relationship with market valuation that is not statistically significant.

Simultaneous Test (F Test)

Table 10. F Test Result

R-squared	0.275060	Mean dependent var	0.080830
Adjusted R-squared	0.223278	S.D. dependent var	0.257083
S.E. of regression	0.226572	Sum squared resid	3.593442
F-statistic	5.311940	Durbin-Watson stat	1.421821
Prob(F-statistic)	0.000340		

Source: Eviews Output Results (Data processed 2026)

The F test evaluates whether all independent, moderating, and control variables jointly exert a statistically significant influence on Firm Value (Hair et al., 2019). Under the weighted Random Effect Model statistics, the regression estimation yields an F statistic value of 5.3119 with a probability significance of 0.000340. Because the probability value

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

is far below the 0.05 significance threshold, all explanatory variables simultaneously exert a significant effect on Tobin's Q, proving that the Random Effect Model possesses strong overall model fit.

Partial Test (t Test)

Table 11. T Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.391506	2.102399	3.515748	0.0008
ROAA	0.816496	0.294604	2.771502	0.0071
ESGSCORE	0.006627	0.003313	2.000306	0.0493
MODERATION	0.005057	0.019639	0.257494	0.7976
FIRMSIZE	-0.233504	0.068869	-3.390544	0.0011
DER	0.004317	0.046845	0.092161	0.9268

Source: Eviews Output Results (Data processed 2026)

The t test evaluates the individual statistical significance of each explanatory variable on Firm Value at a 5 percent significance level Widarjono, 2018).

1. The Effect of Profitability on Firm Value (H1): Return on Assets yields a calculated t statistic of 2.7715 with a probability value of 0.0071. Because the probability value is less than 0.05 and the regression coefficient is positive at 0.8165, Hypothesis 1 is accepted. This demonstrates that Profitability has a statistically significant positive effect on Firm Value among listed mining companies on the BEI for the 2021 to 2024 period.
2. The Moderating Role of ESG Score on Profitability and Firm Value (H2): The moderation interaction term yields a calculated t statistic of 0.2575 with a probability value of 0.7976. Because the probability value exceeds 0.05, Hypothesis 2 is rejected. This confirms that ESG Score does not moderate the effect of Profitability on Firm Value in listed Indonesian mining firms during the 2021 to 2024 period.
3. Influence of Control Variables: Firm Size exhibits a significant negative effect on Firm Value with a t statistic of -3.3905 and a probability value of 0.0011, confirming that market valuation ratios decrease as total asset scale expands . Debt to Equity Ratio shows an insignificant positive effect on Firm Value with a t statistic of 0.0922 and a probability value of 0.9268.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Coefficient of Determination Test (R Squared)

Table 12. R Squared Test Result

R-squared	0.275060	Mean dependent var	0.080830
Adjusted R-squared	0.223278	S.D. dependent var	0.257083
S.E. of regression	0.226572	Sum squared resid	3.593442
F-statistic	5.311940	Durbin-Watson stat	1.421821
Prob(F-statistic)	0.000340		

Source: Eviews Output Results (Data processed 2026)

The coefficient of determination measures the overall explanatory capacity of the Random Effect Model (Hair et al., 2019). Based on the weighted statistics output, the model yields an R squared value of 0.2751 and an Adjusted R squared value of 0.2233. This demonstrates that 22.33 percent of the variation in Firm Value is explained by Return on Assets, ESG Score, their moderation interaction, Firm Size, and Debt to Equity Ratio simultaneously. The remaining 77.67 percent of valuation variation is driven by external factors outside the empirical model, such as global mineral commodity price volatility, macroeconomic interest rates, and government mining regulations.

DISCUSSION

The empirical analysis evaluates the structural drivers of firm value within the Indonesian mining sector, providing critical confirmation regarding how financial and non financial signals interact under signaling theory.

Confirmation of Profitability in Driving Firm Value

The empirical results confirm Hypothesis 1, proving that Profitability exerts a positive and statistically significant impact on Firm Value among listed mining entities. This finding strongly validates Signaling Theory by confirming that financial performance serves as a primary, highly credible signal that successfully reduces information asymmetry in capital markets (Spence, 1973; Brigham & Houston, 2018). In extractive industries characterized by high operational volatility and environmental exposure, external investors encounter substantial difficulty in assessing internal management efficiency. Superior Return on Assets transmits a clear signal regarding operational resilience, asset productivity, and disciplined cost structures (Yusra & Sulistyowati, 2023; Setiawanta et al., 2021). Market participants process this positive signal as a guarantee of future cash flow stability and dividend distribution capacity, prompting investors to pay a valuation premium for corporate equity relative to physical replacement costs (Tobin, 1969; Arhinful & Radmehr, 2023). Consequently, the signaling mechanism established in the theoretical framework is fully supported in the Indonesian mining context.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Evaluating the Non Moderating Role of ESG Score

The empirical findings reject Hypothesis 2, establishing that Environmental, Social, and Governance score fails to moderate the relationship between Profitability and Firm Value. From a Signaling Theory perspective, non financial scores are conceptualized as secondary reinforcing signals intended to validate corporate reputation and lower perceived risk (Spence, 1973; Oehler & Neuss, 2025). However, the empirical evidence demonstrates a boundary condition of signaling theory within emerging commodity markets. Driven by the 2021 to 2024 global commodity supercycle, capital market participants prioritized immediate earnings and short term cash generation over non financial sustainability metrics (Fikru et al., 2024; Dogan et al., 2026). Investors perceive ESG score primarily as regulatory compliance mandated by stock exchange authorities rather than a core strategic capability that amplifies underlying profit quality (Dogan et al., 2026). As a result, when a mining enterprise achieves high operational profitability, market actors react directly to the primary financial signal without adjusting valuation premiums based on secondary ESG scores (Fikru et al., 2024).

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study evaluates the impact of Profitability on Firm Value and determines whether Environmental, Social, and Governance score moderates this relationship among listed mining companies on the Indonesia Stock Exchange. Based on the Random Effect Model analysis, the research answers the central empirical problems as follows:

1. Profitability exerts a significant positive effect on Firm Value. High asset productivity transmits a strong positive signal that reduces information asymmetry, builds investor confidence, and enhances corporate market valuation.
2. The interaction term of Environmental, Social, and Governance disclosure (ROA x ESG) does not moderate the relationship between Profitability and Firm Value. Capital market investors evaluating high pollution extractive sectors during commodity price surges prioritize fundamental financial returns over non financial sustainability reporting, treating ESG disclosures as administrative compliance rather than a value multiplying signal.

Recommendations

1. For Mining Management: Corporate executives must maintain primary strategic focus on operational cost efficiency and asset productivity to enhance profitability, while embedding ESG practices into core operations rather than treating sustainability reporting as symbolic compliance.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

2. For Investors: Capital market actors should prioritize fundamental earning capacity and operational cash flows when valuing mining equities, utilizing sustainability scores as risk screening tools.
3. For Regulators: Stock exchange authorities should enhance standardized reporting frameworks to ensure ESG scores reflect substantive operational sustainability.

Limitations and Future Research

This study is limited to 19 listed mining firms over a four year observation period using published index scores. Future research should extend the observation window, cover broader energy subsectors, and explore alternative moderating mechanisms such as dividend policy and board diversity.

REFERENCES

Afiezan, A., Melysa, M., Angga, V. J., Lionar, R., & Jesica, J. (2022). Pertumbuhan Penjualan, Struktur Aktiva, Ukuran Perusahaan, Dan Harga Saham Terhadap Struktur Modal Dengan Profitabilitas Sebagai Variabel Moderasi. Journal Of Management And Bussines (Jomb), 4(1), 277–296. Https://Doi.Org/10.31539/Jomb.V4i1.3718

Akerlof, G. A. (1970). The Market For “Lemons”: Quality Uncertainty And The Market Mechanism *. In Source: The Quarterly Journal Of Economics (Vol. 84, Number 3).

Aydoğmuş, M., Gülay, G., & Ergun, K. (2022). Impact Of Esg Performance On Firm Value And Profitability. In Borsa Istanbul Review (Vol. 22, Pp. S119–S127). Borsa Istanbul Anonim Sirketi. Https://Doi.Org/10.1016/J.Bir.2022.11.006

Brigham, E. F., & Houston, J. F. (2018). Fundamentals Of Financial Management. Cengage Learning. Https://Books.Google.Co.Id/Books?Id=Kprueaaaqbaj

Chen, C., Yan, Y., Jia, X., Wang, T., & Chai, M. (2024). The Impact Of Executives’ Green Experience On Environmental, Social, And Governance (Esg) Performance: Evidence From China. Journal Of Environmental Management, 366, 121819. Https://Doi.Org/Https://Doi.Org/10.1016/J.Jenvman.2024.121819

Dogan, M. A., Guloglu, B., & Aydemir, R. (2026). Sustainability And Profitability: The Esg Impact On Eurozone Emission-Intensive Sectors. Borsa Istanbul Review. Https://Doi.Org/10.1016/J.Bir.2026.100807

Environesia. (2025). 3 Sektor Industri Paling Banyak Melanggar Aturan Lingkungan Di Indonesia. Environesia Global Sustainable.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Fikru, M. G., Brodmann, J., Eng, L. L., & Grant, J. A. (2024). Esg Ratings In The Mining Industry: Factors And Implications. Extractive Industries And Society, 20. Https://Doi.Org/10.1016/J.Exis.2024.101521

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate Data Analysis Eighth Edition. Www.Cengage.Com/Highered

Kasmir. (2019). Analisis Laporan Keuangan. Rajawali Pers.

Kirana, A., Riwanda, P., & Maryani, N. (2026). The Influence Of Profitability On Firm Value….. 1681 The Influence Of Profitability On Firm Value With Esg Disclosure As A Moderating Variable. In Indonesian Interdisciplinary Journal Of Sharia Economics (Iijse) (Vol. 9, Number 1).

Lokuwaduge, C. S. D. S., & Heenetigala, K. (2017). Integrating Environmental, Social And Governance (Esg) Disclosure For A Sustainable Development: An Australian Study. Business Strategy And The Environment, 26(4), 438–450. Https://Doi.Org/10.1002/Bse.1927

Naeem, N., Cankaya, S., & Bildik, R. (2022). Does Esg Performance Affect The Financial Performance Of Environmentally Sensitive Industries? A Comparison Between Emerging And Developed Markets. In Borsa Istanbul Review (Vol. 22, Pp. S128–S140). Borsa Istanbul Anonim Sirketi. Https://Doi.Org/10.1016/J.Bir.2022.11.014

Oehler, A., & Neuss, C. (2025). Esg Disclosure Vs. Esg Ratings: Consistent Information Value? International Review Of Financial Analysis, 107. Https://Doi.Org/10.1016/J.Irfa.2025.104623

Sachs, J. D., Lafortune, G., & Fuller, G. (2025). Sustainable Development Report 2025.

Setiawanta, Y., Dwiarso Utomo, S., Dapit Pamungkas, I., & Muhimatul Ifada, L. (2021). The Impact Of Profitability On Firm Value: Does Environmental Performance Play A Mediation Role? Journal Of Hunan University, 48(7). Www.Idx.Co.Id

Spence, M. (1973). Job Market Signaling *. Http://Qje.Oxfordjournals.Org/

Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif, Dan R&D. Alfabeta.

Tobin, J. (1969). A General Equilibrium Approach To Monetary Theory. Journal Of Money, Credit And Banking, Vol. 1, No. 1 (Feb., 1969), Pp. 15-29.

Waddock, S. A., & Graves, S. B. (1997). The Corporate Social Performance-Financial Performance. In Graves Source: Strategic Management Journal (Vol. 18, Number 4).
Http://Www.Jstor.Orgurl:Http://Www.Jstor.Org/Stable/3088143http://Www.Jstor.Org/Stable/3088143?Seq=1&Cid=Pdf-Reference#References_Tab_Contents

Widarjono, A. (2018). Analisis Statistika Multivariat Terapan. Upp Stim Ykpn.

Yusra, M. A., & Sulistyowati, E. (2023). The Effect Of Profitability, Good Corporate Governance, And Environmental Disclosure On Firm Value In Mining Companies Listed On The Indonesia Stock Exchange. Jurnal Pamator : Jurnal Ilmiah

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Universitas Trunojoyo, 16(3), 661–673. Https://Doi.Org/10.21107/Pamator.V16i3.22079

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.