
The Effect of Financial Performance and Sustainability Performance on Stock Prices with Earnings Management as a Moderating Variable in the Coal Sub-Sector of Southeast Asia 2022-2024

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Abstract:

This study aims to analyze the effect of financial performance and sustainability performance on stock prices, as well as to examine the moderating role of earnings management in coal sub-sector companies in Southeast Asia. The study uses secondary data obtained from financial statements and sustainability reports of coal companies in Southeast Asia during the 2018–2022 period with a total of 105 observations. The data were analyzed using multiple linear regression and Moderated Regression Analysis (MRA) with the assistance of SPSS version 26. The results indicate that financial performance has a positive and significant effect on stock prices, while sustainability performance does not have a significant effect. Furthermore, earnings management is proven to moderate the relationship between financial performance and stock prices positively, but it negatively moderates the relationship between sustainability performance and stock prices. This study contributes to the finance and sustainability literature by integrating financial performance, sustainability performance, and earnings management practices into a single research model within the coal sector in Southeast Asia. Previous studies mostly focused on the direct relationship between financial or ESG performance and stock prices, while this study highlights the role of earnings management as both a strengthening and weakening factor in such relationships. This research provides practical implications for investors to consider not only profitability but also governance transparency in order to avoid information distortion caused by earnings management. For regulators, the findings can serve as a basis for strengthening sustainability reporting requirements in coal companies. For corporate management, the study emphasizes the importance of integrating sustainability with sound governance practices to enhance long-term firm value.

Keywords *Financial Performance, Sustainability Performance, Stock Prices, Earnings Management, Coal Sector.*

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1. Introduction

The coal industry continues to play a crucial role in the economies of Southeast Asian countries, including Indonesia. Growing energy demand in Southeast Asia has made coal a primary energy source, despite global pressure to shift to renewable energy. Indonesia is the world's second-largest producer and exporter, driven by strong domestic and international demand from China, Malaysia, the Philippines, and Vietnam (Clark et al., 2020). In 2019, coal demand was projected to grow 5 percent annually in Southeast Asia through 2023, the highest growth rate in the world (Sagbakken et al., 2021). The following graph shows coal consumption in several regions from 2017 to 2024:

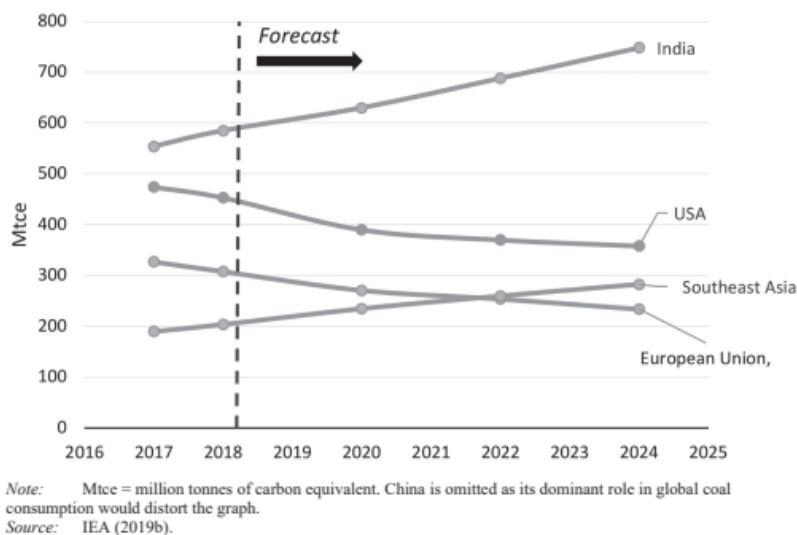


Figure 1. Coal consumption by region/country, 2017–2024
Source: (Sagbakken et al., 2021)

Based on the graph above, coal consumption in several regions shows varying trends from 2017 to the projected year of 2024. India is projected to become the largest coal consumer, with a steady upward trend from around 550 Mtce in 2017 to more than 700 Mtce in 2024. Conversely, the United States (US) and the European Union show a significant downward trend in consumption. US consumption decreases from nearly 500 Mtce in 2017 to around 350 Mtce in 2024, while the European Union falls from around 320 Mtce to less than 250 Mtce. Meanwhile, Southeast Asia is projected to experience the sharpest increase in consumption. Coal consumption in Southeast Asia rises from around 200 Mtce in 2017 to nearly 300 Mtce in 2024. This trend indicates that while developed countries such as the US and the EU are reducing their reliance on coal, developing regions such as India and Southeast Asia are instead increasing their consumption. In 2022, coal consumption in Southeast Asia is projected to surpass that of the European Union. This trend reflects global dynamics in energy demand, where economic growth and electrification needs in the Asian region are the main drivers of coal consumption. This phenomenon illustrates a contradiction: on the one hand, coal is still needed for development, but on the other hand, the industry faces

immense pressure from the global energy transition agenda. Nevertheless, commodity price volatility, international energy policies, and pressures from sustainability demands increasingly affect the stability of this sector. These pressures directly impact the financial performance of coal companies, which in turn influence market perception and stock prices (Zhou, 2024). In addition, stock price fluctuations in the coal sector are often sharper than in other sectors due to its high sensitivity to external factors, ranging from environmental policies to energy geopolitics. This condition makes research on the factors influencing stock prices in the coal sector increasingly relevant, particularly by considering financial variables, sustainability, and corporate governance practices.

Financial performance can serve as important information for investment decision-making because it reflects a company's health and future prospects (Noviyanti et al., 2021). The higher the financial performance, the greater the company's ability to generate profit using its assets (Syafii et al., 2020). In this study, financial performance is proxied by ROA. Previous research has tested the effect of financial performance on stock prices. The findings of earlier studies (Fathony et al., 2020; Suhadak et al., 2020) explain that financial performance has a significant positive effect on stock prices. Meanwhile, according to (Prayoga et al., 2022; Choiriyah et al., 2020), financial performance does not have a significant effect on stock price increases. These findings emphasize the importance of financial performance in signaling to investors but also reveal inconsistencies when non-financial variables are included in the analysis. In other words, previous research results remain inconclusive and open up opportunities to re-examine the role of financial performance in the highly risky coal industry context.

Beyond financial aspects, corporate sustainability performance has now become an increasingly important issue for investors and other stakeholders. Along with the strengthening of environmental, social, and governance (ESG) issues in corporate accountability, major stakeholders including capital markets, governments, and civil society are increasingly pressing MNEs to integrate sustainability into their core business strategies (Goerzen et al., 2025). As long as a company's values or norms align with social values, it will gain legitimacy and support from stakeholders (Indriastuti & Chariri, 2021). Disclosure of information related to social and environmental responsibility is believed to enhance transparency, strengthen reputation, and ultimately have a positive impact on firm value. In addition, the development of reporting standards such as the GRI Standards and regulatory pressures from governments in Southeast Asia further emphasize the obligation of coal issuers to consistently present their sustainability performance.

Several previous studies have examined the impact of sustainability performance on stock prices. Research by (Zhang & Hsu, 2025; Murwijaya, 2025; Anisa & Panuntun, 2025; Yadav et al., 2025) found that divergence in ESG ratings significantly increases the risk of stock price crashes, meaning ESG Score significantly affects stock prices, while (Escobar-Saldivar et al., 2025) showed the opposite—that there is no significant effect between social responsibility disclosure and stock prices. These differing findings highlight that the relationship between sustainability performance and market

value remains inconclusive, thus requiring further research, especially in the coal sector which faces immense pressure on sustainability practices. This uncertainty becomes increasingly important to test because investors now assess not only profitability but also how companies manage sustainability risks that may have long-term impacts on business continuity.

Furthermore, the role of earnings management becomes an important factor that can influence the relationship between financial performance, sustainability performance, and stock prices. Earnings management, defined as managers' efforts to manipulate financial statements to meet certain targets, can create distortions in the information received by investors (Permana et al., 2025). This practice has the potential to weaken the validity of accounting information, preventing investors from accurately assessing a company's fundamentals. The sustainability efforts reported by companies may not necessarily reflect actual conditions due to the potential for financial reporting manipulation (Al-Matari, 2025). However, research examining earnings management as a moderating variable in the relationship between financial performance, sustainability performance, and stock prices remains very limited, especially in coal sector companies in Southeast Asia. This signals the need for new research that integrates financial, sustainability, and managerial opportunistic behavior perspectives simultaneously to provide a more comprehensive picture.

Thus, there is a clear research gap. First, prior research in Indonesia and Southeast Asia has mostly focused on the direct influence of financial performance on stock prices, while sustainability variables have not been deeply examined. Second, findings regarding the influence of sustainability performance on firm value show mixed and inconsistent results, requiring further investigation. Third, the role of earnings management as a moderating variable in the relationship between financial performance, sustainability, and stock prices has rarely been studied, even though this practice has significant potential to affect investor decisions in capital markets. Therefore, this study seeks to fill this gap by providing a more integrative analysis. Based on this background, this study aims to analyze the effect of financial performance and sustainability performance on stock prices in coal sub-sector companies in Southeast Asia by including earnings management as a moderating variable. This research is expected to provide theoretical contributions in enriching the literature on the relationship between finance, sustainability, and earnings management practices in the context of capital markets in the extractive sector. In addition, this study also provides practical contributions for investors, regulators, and corporate management in understanding the dynamics of factors that influence stock prices, so that they can be used as a basis for more accurate decision-making amid global challenges in the coal-based energy sector.

The coal sector is chosen in this study because it holds a strategic yet dilemmatic role in Southeast Asia's economy. On one hand, coal remains a major contributor to state revenue, export earnings, and employment, especially in Indonesia as the region's main exporter. On the other hand, this sector faces global pressure to reduce carbon emissions and adapt to increasingly stringent energy transition policies. The capital-intensive, export-oriented nature of coal, along with its dependence on international

commodity prices, makes the stock prices of coal companies more volatile compared to other sectors. In addition, sustainability issues in the coal industry are a major concern as it is considered a significant contributor to climate change. These factors make the coal sector highly relevant to be studied, both from the perspective of financial performance and sustainability performance, while also opening space to analyze how earnings management practices may moderate their effects on stock prices.

2. Theoretical Background

Financial performance is one of the most fundamental indicators most widely used by investors to assess a company's prospects in the capital market. The financial information presented in annual reports provides important signals regarding a company's ability to generate profits, efficiency in managing assets, and long-term competitiveness (Noviyanti et al., 2021). Profitability ratios such as Return on Assets (ROA) are often used to measure a company's effectiveness in utilizing resources to generate profit. A higher ROA value reflects stronger profitability capacity, thereby increasing investor confidence and driving stock price appreciation (Syafii et al., 2020). Signaling theory also explains that strong financial performance serves as a positive signal to the market, as it is perceived as an indicator of the company's future growth prospects (Arhinful et al., 2025).

A number of empirical studies show a significant relationship between financial performance and stock prices. Fathony et al. (2020) found that profitability measured by ROA has a significant positive effect on stock prices in mining sector companies in Indonesia. The significant effect of ROA indicates that investors assume firms with high ROA will deliver higher returns, making profit information highly valuable in investment decision-making. Similar findings are reported by Suhadak et al. (2020), who stated that financial performance can increase the attractiveness of a stock in the eyes of investors. Financial indicators such as EPS and ROA are considered key determinants of stock price movements in the energy sector. However, Prayoga et al. (2022) found that profitability ratios had a significance value of 0.897, greater than 0.05, indicating that profitability ratios did not significantly affect stock prices—possibly because investors consider factors beyond high profitability. External factors may include market conditions, inflation, economic conditions, or even non-financial aspects such as the performance of a football club. Likewise, Choiriyah et al. (2020) found that the calculated t-value of 0.952 was lower than the critical t-table value of 2.021, with a significance level of 0.348 greater than the alpha of 0.05, suggesting that H_0 was accepted—meaning ROA had no significant impact on stock prices. Thus, the effect of financial performance is not always significant, particularly when non-financial factors such as macroeconomic conditions or sustainability issues also shape market sentiment. Nevertheless, the literature generally supports the view that sound financial performance tends to increase firm market value.

Considering the theory and empirical evidence, it can be assumed that the better the financial performance demonstrated by a company, the greater the likelihood that its

stock price will rise, as investors perceive the company to have stronger future prospects. Therefore, the first hypothesis of this study is formulated as follows:

Hypothesis 1: Financial performance has a significant effect on the stock prices of coal sector companies in Southeast Asia during 2022–2024.

Corporate sustainability performance, often measured by the Environmental, Social, and Governance (ESG) Score, has increasingly gained attention in capital market research. ESG reflects the extent to which a company is accountable for environmental and social impacts while ensuring sound governance practices. Legitimacy theory explains that firms will gain legitimacy from stakeholders if their activities and values align with prevailing social norms (Indriastuti & Chariri, 2021). Accordingly, the disclosure of sustainability performance serves not only as a tool of accountability but also as a strategy to maintain investor trust and enhance corporate reputation. For extractive industries such as coal, sustainability is particularly critical, as the sector is often linked to environmental degradation, carbon emissions, and social risks. Thus, investor assessments of coal company stocks depend not only on financial performance but also on how well firms manage sustainability dimensions.

Empirical research supports the importance of ESG in shaping firm market value. Zhang & Hsu (2025) showed that ESG rating divergence has a significant positive effect on stock price crash risk. Their mechanism tests revealed two channels: first, ESG divergence increases reputational risk and erodes investor trust; second, it reduces external monitoring attention and legitimizes managerial opportunism, ultimately leading to deeper information asymmetry and heightened risk accumulation. Murwijaya (2025) and Anisa & Panuntun (2025) similarly demonstrated that firms with strong ESG scores tend to have more stable and less risky stock prices, whereas ESG rating divergence elevates crash risk. Yadav et al. (2025) also found that investors tend to place a premium on stocks of firms with strong ESG reputations, as they are perceived to be more resilient against long-term risks. Conversely, Escobar-Saldívar et al. (2025) reported that social responsibility disclosure had no significant effect on stock prices, particularly in emerging markets where financial factors remain more dominant in shaping investment decisions. These mixed findings highlight that although ESG's theoretical importance is well-established, its empirical significance depends heavily on industry and regional context.

Taking into account legitimacy theory and prior empirical findings, it can be assumed that higher sustainability performance, as reflected in ESG scores, provides a positive signal to investors, enhances market confidence, and ultimately drives stock price increases. This is particularly relevant for coal companies in Southeast Asia, which face heavy scrutiny over environmental issues. Therefore, the second hypothesis is formulated as follows:

Hypothesis 2: Sustainability performance (ESG Score) has a significant effect on the stock prices of coal sector companies in Southeast Asia during 2022–2024.

Financial performance, as reflected by profitability indicators such as ROA, is often perceived as a positive signal for investors because it shows the firm's ability to

generate earnings from its assets. However, financial performance does not always accurately represent a company's fundamentals, particularly when earnings management practices are applied. Earnings management is defined as deliberate managerial intervention in financial reporting designed to achieve certain profit targets by varying accounting practices without violating accounting standards (Sadowski et al., 2025). Such practices may bias financial statements, thereby reducing the reliability of information provided to investors.

Theoretically, **Agency Theory** explains that conflicts of interest between managers and shareholders may drive managers to engage in earnings management. To present strong financial performance to the market, managers may manipulate accounting figures to make profitability ratios appear higher. This distortion weakens the relationship between financial performance and stock prices, as share prices may be influenced not by true fundamentals but by manipulated profit information. Earnings management is often used to smooth reported earnings, making them appear more stable and attractive to investors. Devi & Aisyah (2025) found that earnings management could weaken the relationship between profitability and firm value, as reported earnings may not fully reflect actual performance. In some cases, opportunistic earnings management may strengthen short-term profit signals to investors, though it could be detrimental in the long run. These contrasting findings suggest that the moderating role of earnings management can either strengthen or weaken the relationship between financial performance and stock prices, depending on the context and intensity of the practice.

Thus, it can be assumed that when earnings management is intensively practiced, the relevance of financial performance information in influencing stock prices diminishes. Conversely, if earnings management is applied to stabilize reported earnings, the relationship between financial performance and stock prices may appear stronger to investors. Based on theoretical arguments and empirical evidence, the third hypothesis is formulated as follows:

Hypothesis 3: Earnings management moderates the relationship between financial performance and stock prices of coal sector companies in Southeast Asia during 2022–2024.

Sustainability performance, represented by the ESG Score, is increasingly valued by investors as it reflects a company's commitment to responsible business practices. Legitimacy theory states that companies aligning their operations with societal norms and values will gain legitimacy from the public and stakeholders, ultimately enhancing firm value (Indriastuti & Chariri, 2021). Accordingly, sustainability disclosures are often used by companies—including those in extractive sectors like coal—to build a positive image and attract investor attention.

However, sustainability information disclosed by companies may not always represent actual conditions due to the possibility of concurrent earnings management practices. Managers may use earnings management to shape investor perceptions of corporate performance, both in financial and sustainability reporting (Gibson Brandon et al., 2025). This makes sustainability reports vulnerable to being used as legitimacy tools (greenwashing), intended to enhance corporate image without substantive

improvements in environmental or social practices. Thus, earnings management may moderate the impact of sustainability performance on stock prices by reducing the credibility of information available to investors.

Empirical studies support this possibility. Nadias (2025) found that companies with weak governance practices tend to use CSR and sustainability reporting as tools to mask earnings management. High levels of social disclosure may not necessarily reflect genuine sustainability performance but rather serve to divert stakeholder attention from earnings manipulation. Conversely, Samosir et al. (2025) emphasized that credible sustainability disclosures enhance firm market value, but when such reports are influenced by earnings management, their relevance to stock prices weakens.

Based on theoretical foundations and empirical findings, it can be assumed that earnings management may diminish, or even obscure, the influence of sustainability performance on stock prices. While investors may initially respond positively to sustainability disclosures, if such practices are accompanied by earnings management, market trust in the quality of information declines. Therefore, the fourth hypothesis is formulated as follows:

Hypothesis 4: Earnings management moderates the relationship between sustainability performance and stock prices of coal sector companies in Southeast Asia during 2022–2024.

3. Methodology

This study employs a quantitative approach with a causal design to analyze the effect of financial performance and sustainability performance on stock prices, with earnings management as the moderating variable. The quantitative approach was chosen because this research focuses on hypothesis testing through numerical data analysis that can be measured objectively and statistically tested.

The study uses secondary data obtained from stock exchanges in Southeast Asian countries, annual reports, and companies' sustainability reports. The population of this research consists of 65 coal sub-sector companies in Southeast Asia during the period 2022–2024. The research period was selected based on the availability of annual financial reports, sustainability reports, and stock price data over the past three years.

The sampling technique employed is purposive sampling, namely selecting companies based on specific criteria: (1) companies that consistently generate profits during the research period, (2) companies that publish complete annual financial reports, (3) companies that have annual stock price data, and (4) companies that provide information related to sustainability practices or sustainability reports. Based on these criteria, 35 companies were obtained as the final sample, consisting of 31 companies from Indonesia, 2 companies from Singapore, 1 company from the Philippines, and 1 company from Thailand. The research samples used are presented in Table 1.

Table 1. Research Sample

No	Company Code	Company Name
1	TPMA	PT. Trans Power Marine Tbk
2	TOBA	PT. TBS Energi Utama Tbk
3	TEBE	PT. Dana Brata Luhur Tbk
4	TCPI	PT. Transcoal Pacific Tbk
5	SMMT	PT. Golden Eagle Energy Tbk
6	RMKE	PT. RMK Energy Tbk
7	RIGS	PT. Rig Tenders Indonesia Tbk
8	PTBA	PT. Bukit Asam Tbk
9	PSSI	PT. IMC Pelita Logistik Tbk
10	MCOL	PT. Prima Andalan Mandiri Tbk
11	MBSS	PT. Mitrabahtera Segara Sejati Tbk
12	MBAP	PT. Mitrabara Adiperdana Tbk
13	KKGI	PT. Resource Alam Indonesia Tbk
14	ITMG	PT. Indo Tambangraya Megah Tbk
15	INDY	PT. Indika Energy Tbk
16	IATA	PT. MNC Energy Investments Tbk
17	HRUM	PT. Harum Energy Tbk
18	GTBO	PT. Garda Tujuh Buana Tbk
19	GEMS	PT. Golden Energy Mines Tbk
20	DWGL	PT. Dwi Guna Laksana Tbk
21	DSSA	PT. Dian Swastatika Sentosa Tbk
22	COAL	PT. Black Diamond Resources Tbk
23	BYAN	PT. Bayan Resources Tbk
24	BUMI	PT. Bumi Resources Tbk
25	BSSR	PT. Baramulti Suksessarana Tbk
26	BIPI	PT. Astrindo Nusantara Infrastruktur Tbk
27	BESS	PT. Batulicin Nusantara Maritim Tbk
28	ARII	PT. Atlas Resources Tbk
29	ADRO	PT. Alamtri Resources Indonesia Tbk
30	ADMR	PT. Alamtri Minerals Indonesia Tbk
31	ABMM	PT. ABM Investama Tbk
32	SCC	Semirara Mining and Power Corporation (SMPC)
33	GEOE	Geo Energy Resources Ltd
34	RESU	Resources Global
35	LANNA	Lanna Resources

Table 2. Operational Definition of Variables

Variable	Conceptual Definition	Operational Definition	Source
Financial Performance	The level of a company's effectiveness in utilizing assets to generate profit, reflecting the company's fundamental condition.	Measured by Return on Assets (ROA) = $\text{Net Income} / \text{Total Assets} \times 100\%$	Annual Report
Sustainability Performance (ESG Score)	The company's achievement in environmental, social, and governance aspects that demonstrates accountability and legitimacy in the eyes of stakeholders.	Measured using the ESG Disclosure Score based on environmental, social, and governance disclosure items according to GRI Standard 2021.	Sustainability Report
Stock Price	The company's market value reflected in the stock price traded on the exchange, as an indicator of company performance in the eyes of investors.	Year-end closing stock price of coal sub-sector companies listed on the stock exchange.	Stock Exchange
Earnings Management	Managerial actions in modifying financial statements to achieve certain objectives, either opportunistically or informatively.	Measured using the Modified Jones Model to detect discretionary accruals.	

Source: Processed Data by Researcher (2025)

The data analysis technique in this study was carried out using Moderated Regression Analysis (MRA) to examine the role of earnings management as a moderating variable. Before hypothesis testing, the data were first tested through a series of classical assumption tests, including normality, multicollinearity, heteroscedasticity, and autocorrelation tests. Subsequently, multiple regression analysis was performed to analyze the effect of financial performance and sustainability performance on stock prices, followed by interaction testing to identify the role of earnings management as a moderator. The analysis was conducted with the assistance of statistical software such as SPSS version 26.

With this research design, the results are expected to be verifiable and replicable in accordance with scientific principles. The use of purposive sampling ensures that the selected companies are relevant to the research objectives, while the application of moderated regression allows the researcher to evaluate not only the direct

relationships among variables but also how earnings management practices strengthen or weaken the influence of financial and sustainability performance on stock prices.

4. Empirical Findings/Result

This section presents the research findings obtained from data processing related to the independent, dependent, and moderating variables. The independent variables in this study consist of financial performance (X1), proxied by Return on Assets (ROA), and sustainability performance (X2), proxied by the ESG Score. To provide an initial overview of the research data conditions, descriptive statistical analysis was carried out for each variable.

Based on the results of the initial normality test, it was found that the data for financial performance (X1), sustainability performance (X2), and stock price (Y) were not normally distributed. Non-normal distributions may cause violations of regression assumptions and reduce the validity of the analysis results. Therefore, data transformation was performed using the natural logarithm (Ln) for these three variables. The Ln transformation was chosen because it can reduce skewness, stabilize variance, and make the data closer to a normal distribution. Consequently, subsequent statistical analyses such as classical assumption tests and moderated regression analysis can be more valid and reliable.

Meanwhile, the earnings management variable (M) did not require transformation, as the results indicated that its data distribution was already sufficiently close to normal. Thus, the transformation was only applied to variables X1, X2, and Y to meet regression prerequisites and improve the quality of the research findings.

The descriptive analysis aims to identify the minimum, maximum, mean, and standard deviation values of the research data. The results of the descriptive analysis provide insights into the characteristics of the data distribution and general tendencies that emerge from the variables studied, as presented in Table 4.

Tabel 4. Analisis Deksriptif Statistik

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
LogX1	105	-6.64	-.48	-2.2264	1.20347
LogX2	105	-.53	1.10	.6544	.33371
Earning Management	105	-.57326	1.20896	.0140746	.19534636
LogY	105	3.83	11.70	7.1668	1.70961
Valid N (listwise)	105				

Sources: *SPSS vs 26*

Based on the results of the descriptive statistical analysis in Table 4, it can be seen that the total number of observations used in this study is 105. The financial performance variable, which was transformed using the natural logarithm (LogX1),

has a minimum value of -6.64 and a maximum of -0.48 , with a mean of -2.2264 and a standard deviation of 1.20347 . This indicates that there is a relatively large variation in the financial performance levels of coal sub-sector companies in Southeast Asia, with the mean value tending to be relatively low.

The sustainability performance variable (LogX2) ranges between -0.53 and 1.10 , with a mean of 0.6544 and a standard deviation of 0.33371 . These values suggest that companies' sustainability performance tends to be at a moderate level, with data variation that is not too wide.

Furthermore, the earnings management variable has a minimum value of -0.57326 and a maximum of 1.20896 , with a mean of 0.0140746 and a standard deviation of 0.19534636 . The mean value, which is close to zero, indicates that earnings management practices among the sample companies are relatively small, although there are still companies engaging in earnings management within a fairly extreme range—either inflating or deflating reported earnings.

The stock price variable, which was also transformed using the natural logarithm (LogY), shows a minimum value of 3.83 and a maximum of 11.70 , with a mean of 7.1668 and a standard deviation of 1.70961 . This reflects a considerable disparity in market capitalization among coal companies, where some companies have relatively high stock prices, while others remain at lower levels.

Classical Assumption Test

The classical assumption test is a prerequisite for multiple regression analysis, as it must be fulfilled to ensure that parameter estimates and regression coefficients are unbiased (Indartini & Mutmainah, 2024). This testing includes normality, multicollinearity, autocorrelation, and heteroscedasticity tests.

In this study, the normality test was conducted using the Kolmogorov-Smirnov Test by examining the significance of the residuals obtained, along with a graphical approach through the normal probability plot (Indartini & Mutmainah, 2024). Normality detection in the plot is carried out by observing the distribution of data points along the diagonal axis of the graph. The results of the residual normality test are presented in Table 5.

Tabel 5. Normality Test
One-Sample Kolmogorov-Smirnov Test

		Unstandardi zed Residual
N		105
Normal Parameters ^{a,b}	Mean	.0000000
	Std.	1.37780515
	Deviation	
Most Extreme Differences	Absolute	.046
	Positive	.046
	Negative	-.046

Test Statistic	.046
Asymp. Sig. (2-tailed)	.200 ^{c,d}
a. Test distribution is Normal.	
b. Calculated from data.	
c. Lilliefors Significance Correction.	
d. This is a lower bound of the true significance.	

Sources: SPSS vs 26

Based on the results in the table above, the significance value is greater than 0.05, namely 0.200. This indicates that the residual data are normally distributed. This finding is further supported by the graphical analysis results, as shown in the Normal Probability Plot in Figure 3.

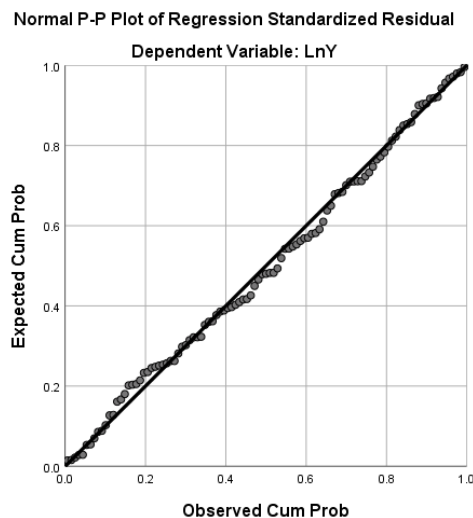


Figure 2. P Plot Normality Test

Sources: SPSS vs 26

Based on the results in the figure above, it can be observed that the plotted points in the Normal P-P Plot of Regression Standardized Residual tend to follow and align closely with the diagonal line. Therefore, following the decision rule for the probability plot technique in the normality test, it can be concluded that the residual values are normally distributed. Thus, the normality assumption for residuals in the linear regression analysis of this study is fulfilled.

Subsequently, a multicollinearity test was conducted. This test aims to determine whether there is a linear correlation between two or more independent variables. If such a condition occurs, it becomes difficult to distinguish the individual effect of each independent variable on the dependent variable. To detect multicollinearity symptoms in the research model, tolerance values and Variance Inflation Factor (VIF) values are examined. The thresholds applied are tolerance > 0.10 and VIF < 10.00 . If these conditions are met, it can be concluded that there is no multicollinearity among

the independent variables (Indartini & Mutmainah, 2024). The results of the multicollinearity test in this study are presented in Table 6.

Table 6. Multicollinearity Test

Coefficients ^a			
Model		Collinearity Statistics	
		Toleranc	VIF
e			
1	(Constant)		
	LnX1	.988	1.012
	LnX2	.995	1.005
	Ear	.991	1.009
a. Dependent Variable: LnY			

a. Dependent Variable: LnY

Sources: SPSS vs 26

The Based on the table above, it can be concluded that the data in this study do not exhibit multicollinearity. This is evident from the tolerance values, which are greater than 0.10 (0.988; 0.995; and 0.991), and the Variance Inflation Factor (VIF) values, which are less than 10.00 (1.012; 1.005; and 1.009). Therefore, it can be concluded that no multicollinearity exists among the independent variables.

The next test is the autocorrelation test, which is conducted to determine whether there is a correlation between the residuals in period t and those in the previous period ($t - 1$). A good regression model is one that is free from autocorrelation. This can be assessed by comparing the Durbin-Watson (D-W) value with the critical values (d) from the Durbin-Watson table. The results of the autocorrelation test in this study are presented in Table 7.

Table 7. Autocorrelation Test

Model Summary ^b					
Mod el	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin- Watson
1	.592 ^a	.350	.331	1.39812	1.200

a. Predictors: (Constant), Earning Management, LnX2, LnX1

b. Dependent Variable: LnY

Sources: SPSS vs 26

Based on the table above, the Durbin-Watson value is 1.200. According to Ghazali (2013), Durbin-Watson values between -2 and 2 indicate that there is no autocorrelation. Since the value of 1.200 falls within this interval, it can be concluded that the multiple linear regression model does not exhibit autocorrelation.

Next, the heteroscedasticity test aims to examine whether there is an inequality of variance in the residuals from one observation to another. A good regression model is one that does not exhibit heteroscedasticity. To detect heteroscedasticity, the Glejser test was applied. The decision criterion in this test is as follows: if the significance value ≥ 0.05 , it can be concluded that there is no heteroscedasticity problem; conversely, if the significance value < 0.05 , heteroscedasticity is indicated. The results of the heteroscedasticity test are presented in Table 8.

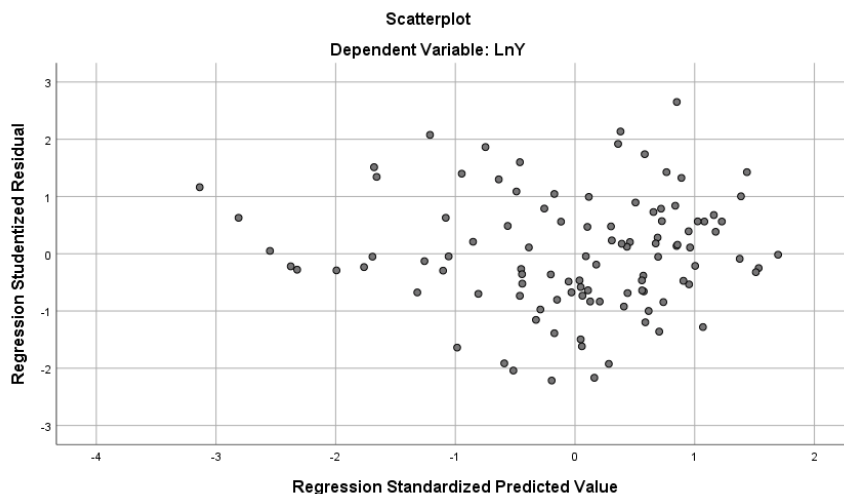
Table 8. Heteroskedasticity Test

Coefficients^a					
Model	Unstandardized Coefficients		Standardize d Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.038	.246		4.213	.000
LnX1	-.005	.070	-.007	-.066	.947
LnX2	.053	.250	.021	.213	.832
Earning Management	.313	.428	.073	.732	.466

a. Dependent Variable: AbsRes

Sources: SPSS vs 26

From the calculation results above, it is shown that the significance values of the variables Financial Performance, Sustainability Performance, and Earnings Management are greater than 0.05 (0.947, 0.832, and 0.466, respectively). Based on this, it can be concluded that no heteroscedasticity occurs among the independent variables in the regression model, and therefore the model is appropriate for use. The scatterplot graph can be seen in Figure 4.

**Figure 3. Scatterplot**

Sources: SPSS vs 26

The results of the heteroscedasticity test displayed in the scatterplot show that the residual points are randomly distributed around the horizontal line at zero, both above and below it. The points do not form any specific pattern, such as converging, widening, or creating a systematic wave. This indicates that the regression model used does not suffer from heteroscedasticity issues. Therefore, the classical assumption of homoscedasticity has been fulfilled, making the regression model appropriate for further analysis.

Hypothesis Testing

After all classical assumption tests were satisfied, multiple linear regression analysis was conducted to examine the effect of Financial Performance and Sustainability Performance on Stock Prices. The results of the multiple linear regression equation are presented in Table 9.

Table 9. Multiple Linear Regression

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.926	.410		21.760	.000
	LnX1	.812	.116	.572	7.030	.000
	LnX2	.075	.417	.015	.179	.858
a. Dependent Variable: LnY						

a. Dependent Variable: LnY

Sources: SPSS vs 26

Based on the table above, the following regression equation was obtained:

$$Y = 8.926 + 0.812 X_1 + 0.075X_2$$

In this regression model, the constant value is 8.926. This coefficient indicates that when Financial Performance (ROA) and Sustainability Performance (ESG Score) are assumed to remain unchanged, the Stock Price will change by the constant value of 8.926. Thus, stock prices tend to increase regardless of variations in ROA and ESG Score.

The multiple regression model also shows that Financial Performance (ROA) has a positive regression coefficient of 0.812. A positive coefficient indicates that the higher the ROA, the greater the tendency for stock prices to increase by 0.812, assuming Sustainability Performance (ESG Score) and other factors remain constant, and vice versa.

In addition, Sustainability Performance (ESG Score) has a positive regression coefficient of 0.075. This means that higher ESG performance tends to increase stock prices by 0.075, assuming ROA and other factors are constant, and vice versa.

The t-test essentially shows the extent to which each independent variable individually influences the dependent variable. The partial test is performed by comparing the calculated t value with the critical t value. If the p-value (significance) is less than 0.05, then H₀ is rejected and H_a is accepted, meaning that the independent variable significantly influences the dependent variable.

Based on the results in the table, the variable Financial Performance (ROA) has a significance value of 0.000, which is smaller than 0.05. According to the testing criteria, when the significance value is below 0.05, it can be concluded that ROA has a significant effect on stock prices. Thus, H₀ is rejected and H₁ is accepted, confirming that ROA significantly influences stock prices.

On the other hand, Sustainability Performance (ESG Score) has a significance value of 0.858, which is greater than 0.05. Therefore, it can be concluded that ESG Score does not significantly influence stock prices. Hence, H0 is accepted and H2 is rejected, confirming that sustainability performance has no significant effect on stock prices.

Furthermore, the coefficient of determination (R^2) from the regression results is used to determine the extent to which the dependent variable can be explained by the independent variables. The results of the R^2 test are presented in Table 10.

Table 10. Coefficient of Determination

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.573 ^a	.328	.315	1.41506
a. Predictors: (Constant), LnX2, LnX1				
b. Dependent Variable: LnY				

Sources: SPSS vs 26

Based on the table above, the coefficient of determination (R^2) is 0.328. This means that Financial Performance (ROA) and Sustainability Performance (ESG Score) contribute 32.8% in explaining stock prices, while the remaining 67.2% is explained by other factors not included in this study.

Next, the F-test was conducted to examine the extent to which the independent variables simultaneously influence the dependent variable. If the significance value is below 0.05, then H0 is rejected and Ha is accepted. This indicates that the independent variables jointly have a significant effect on the dependent variable, and vice versa.

Table 11. Simultaneous Test

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	99.723	2	49.862	24.901	.000 ^b
	Residual	204.244	102	2.002		
	Total	303.967	104			
a. Dependent Variable: LnY						
b. Predictors: (Constant), LnX2, LnX1						

Sources: SPSS vs 26

Based on the table above, the independent variables have a significance value of 0.000, which is less than 0.05. Therefore, according to the testing criteria, if the significance value is less than 0.05, it can be concluded that the variables Financial Performance (ROA) and Sustainability Performance (ESG Score) jointly have a significant effect on stock prices.

Moderated Regression Analysis (MRA)

Hypothesis testing in this study was conducted using Moderated Regression Analysis (MRA). MRA is a special application of multiple linear regression in which the regression equation contains an interaction element (the multiplication of two or more independent variables). The purpose of MRA is to examine the relationship between the independent and dependent variables, where the relationship is influenced by a moderating variable that can either strengthen or weaken the effect. The results of the Moderated Regression Analysis (MRA) are presented in Table 12.

Table 12. Moderated regression Analysis
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	9.020	.406		22.227	.000
LogX1	.924	.123	.650	7.512	.000
LogX2	.331	.415	.065	.798	.427
Earning Management	3.816	2.175	.436	1.755	.082
Financial Performance *	1.324	.658	.393	2.013	.047
Earning Management					
ESG Score *	-4.793	2.253	-.307	-2.128	.036
Earning Management					

a. Dependent Variable: LogY

Sources: SPSS vs 26

Based on the table above, the regression equation is as follows:

$$CI = 9.020 + 0.924X1 + 0.331X2 + 3.816M + 1.324X1 * M - 4.793X2 * M + e$$

$$CI = 9.020 + 0.924X1 + 0.331X2 + 3.816M + 1.324X1 * M - 4.793X2 * M + e$$

The regression analysis shows that the constant value of 9.020 indicates stock prices will increase by this value if all independent variables remain constant. The regression coefficient of Financial Performance (ROA) is 0.924 with a positive sign, meaning that an increase in ROA tends to raise stock prices. Similarly, the coefficient of Sustainability Performance (ESG Score) is 0.331, indicating that a higher ESG Score also tends to increase stock prices, although the effect is weaker. Earnings Management has the strongest positive effect, with a coefficient of 3.816, showing that greater earnings management activity is associated with higher stock prices. The interaction term between Financial Performance and Earnings Management has a positive coefficient of 1.324, suggesting that Earnings Management strengthens the effect of ROA on stock prices. Conversely, the interaction between Sustainability Performance and Earnings Management shows a negative coefficient of -4.793, which

means that Earnings Management tends to weaken the influence of ESG Score on stock prices.

The t-test results provide further evidence of these relationships. For Hypothesis 1 (H1), ROA significantly affects stock prices with a significance value of $0.000 < 0.05$, so H1 is accepted. For Hypothesis 2 (H2), the ESG Score shows a significance value of $0.427 > 0.05$, meaning ESG Score does not significantly influence stock prices, and H2 is rejected. Hypothesis 3 (H3) is accepted because the interaction between ROA and Earnings Management has a significance value of $0.047 < 0.05$, confirming that Earnings Management moderates the effect of ROA on stock prices. Lastly, Hypothesis 4 (H4) is also accepted, as the interaction between ESG Score and Earnings Management shows a significance value of $0.036 < 0.05$, indicating that Earnings Management moderates the relationship between ESG Score and stock prices.

5. Discussion

This study confirms that financial performance, as represented by Return on Assets (ROA), is a primary driver of stock prices in the coal sector. Profitability provides investors with direct evidence of the company's capacity to generate earnings from its assets, which is interpreted as a strong positive signal in capital markets. When companies demonstrate higher profitability, investors are more inclined to purchase shares, thereby pushing stock prices upward. This perspective is consistent with signaling theory, where profitability is perceived as a reliable indicator of management efficiency and future growth potential (Fathony et al., 2020; Suhadak et al., 2020). Similar results have been found across industries, such as in the banking sector (Choiriyah et al., 2020; Noviyanti et al., 2021) and in European sports clubs (Prayoga et al., 2022), as well as in Indonesian stock markets more broadly (Syafii et al., 2020; Zhou, 2024). Thus, financial performance remains a dominant factor shaping investor behavior and market valuation, even in industries like coal that face increasing scrutiny from environmental and policy pressures. The reliance on profitability is particularly relevant for the coal industry in Southeast Asia, which continues to be a critical energy provider despite global decarbonization commitments (Clark et al., 2020; Sagbakken et al., 2021).

Beyond financial performance, this study also highlights the role of earnings management in shaping investor perceptions. The findings reveal that earnings management amplifies the positive relationship between profitability and stock prices. In practice, this means that when companies engage in earnings manipulation, the impact of reported profitability on market valuation becomes even stronger. This pattern emerges because investors often prioritize accounting earnings as a central measure of performance without questioning the accounting treatments underlying those figures. Consequently, manipulated earnings can still generate positive market responses, even if they do not reflect the firm's true fundamentals. Prior studies support this notion, showing that earnings management may enhance the appearance of financial performance and influence investor judgment (Devi & Aisyah, 2025;

Permana et al., 2025; Sadowski et al., 2025). However, such effects are fragile, as they rely on the information asymmetry between managers and investors. Gibson et al. (2025) further argue that investor morality and ethical awareness play an essential role in determining whether they respond critically or naively to manipulated earnings reports. In the long run, reliance on earnings management can create mispriced securities and undermine investor confidence when the manipulations are exposed.

The interaction between earnings management and sustainability performance (ESG Score) introduces a contrasting dynamic. This study finds that earnings management weakens, and even reverses, the effect of ESG performance on stock prices. The negative perception arises because sustainability disclosures are expected to be closely tied to principles of accountability, transparency, and good corporate governance. When such disclosures coexist with earnings manipulation, investors may perceive them as disingenuous, reducing their credibility and weakening their positive impact on firm value. This is consistent with Al-Matari (2025), Nadias (2025), and Samosir et al. (2025), who argue that manipulative financial practices undermine the legitimacy of non-financial reporting. Supporting evidence also comes from broader ESG research: Anisa and Panuntun (2025), Escobar-Saldívar et al. (2025), Yadav et al. (2025), and Zhang and Hsu (2025) all conclude that ESG disclosure generates value only when perceived as authentic and trustworthy. Conversely, when paired with opportunistic managerial practices, ESG is viewed with skepticism, leading to reduced investor trust. This concern has prompted calls for stronger global standards and harmonization in sustainability reporting to ensure credibility and comparability (Goerzen et al., 2025).

In the coal sector, this dynamic is particularly important. As Murwijaya (2025) and Arhinful et al. (2025) explain, sustainability performance in high-emission industries like coal plays a dual role: it can enhance corporate reputation and attract socially responsible investors, but it can also trigger skepticism if not supported by transparent practices. Indriastuti and Chariri (2021) further emphasize the role of green and social investments in reinforcing sustainable legitimacy, which becomes undermined when combined with manipulative accounting behavior. Therefore, while financial performance continues to be the strongest and most reliable signal for investors, sustainability performance remains secondary and fragile, as its value depends heavily on the perceived authenticity of disclosure. In cases where ESG practices are associated with earnings management, the result is not value creation but instead a loss of investor confidence, which directly translates into lower stock prices.

6. Conclusions

The findings of this study reveal that financial performance, as measured by Return on Assets (ROA), has a significant effect on stock prices, indicating that profitability remains the primary indicator considered by investors in assessing firm value. In contrast, sustainability performance measured by the ESG Score does not show a significant effect on stock prices, suggesting that sustainability considerations have not yet become a dominant factor in investment decisions within the coal sector.

Another important finding is the role of earnings management, which strengthens the effect of financial performance on stock prices. This demonstrates that earnings management practices can increase the attractiveness of financial reports for short-term investors, although they may lead to information distortion. Meanwhile, earnings management weakens the relationship between sustainability performance and stock prices, indicating that opportunistic accounting practices contradict the principles of good governance and transparency that underpin sustainability.

The implications of this study suggest that the coal sector continues to face a dilemma between short-term profitability demands and global pressure for sustainable business practices. Investors still prioritize financial performance, while sustainability efforts are not yet strong enough to drive market appreciation and may even become counterproductive when companies are indicated to engage in earnings management. This study contributes by showing that the integration of sustainability aspects into corporate strategy will only have a positive impact if accompanied by good governance and transparent practices.

The limitations of this study lie in its sample, which is restricted to coal sub-sector companies in Southeast Asia, and in the use of the ESG Score as the sole measure of sustainability, thereby limiting generalization. Future research could expand the sample across sectors and employ more comprehensive sustainability indicators, including more detailed social and governance aspects. Furthermore, longitudinal testing with a longer time horizon could provide deeper insights into the dynamics of sustainability's influence on corporate market value in the long term.

References:

- Al-Matari, E. M. (2025). Ownership structure and earnings management: The role of environmental sustainability as moderator variable. *Cogent Business & Management*, 12(1), 2504131. <https://doi.org/10.1080/23311975.2025.2504131>
- Anisa, F., & Panuntun, B. (2025). The influence of ESG disclosure, capital structure, profitability, and company size on company value: An empirical study on IDXESGL companies on the IDX for the 2021–2023 period. *International Journal of Business and Applied Economics*, 4(4), 1773–1790.
- Arhinful, R., Mensah, L., Amin, H. I. M., Obeng, H. A., & Gyamfi, B. A. (2025). The strategic role of sustainable finance in corporate reputation: A signaling theory perspective. *Sustainability*, 17(11), 5002. <https://doi.org/10.3390/su17115002>
- Choiriyah, C., Fatimah, F., Agustina, S., & Ulfa, U. (2020). The effect of return on assets, return on equity, net profit margin, earnings per share, and operating profit margin on stock prices of banking companies in Indonesia Stock Exchange. *International Journal of Finance Research*, 1(2), 103–123.
- Clark, R., Zucker, N., & Urpelainen, J. (2020). The future of coal-fired power generation in Southeast Asia. *Renewable and Sustainable Energy Reviews*, 121, 109650. <https://doi.org/10.1016/j.rser.2019.109650>

- Devi, E. M., & Aisyah, N. (2025). Dinamika profitabilitas, likuiditas, dan ukuran perusahaan: Analisis nilai perusahaan melalui perspektif manajemen laba. *Dinamika Ekonomi: Jurnal Ekonomi dan Bisnis*, 18(1), 107–126.
- Escobar-Saldívar, L. J., Villarreal-Samaniego, D., & Santillán-Salgado, R. J. (2025). The effects of ESG scores and ESG momentum on stock returns and volatility: Evidence from US markets. *Journal of Risk and Financial Management*, 18(7), 367. <https://doi.org/10.3390/jrfm18070367>
- Fathony, M., Khaq, A., & Endri, E. (2020). The effect of corporate social responsibility and financial performance on stock returns. *International Journal of Innovation, Creativity and Change*, 13(1), 240–252.
- Gibson Brandon, R., Sohn, M., Tanner, C., & Wagner, A. F. (2025). Earnings management and the role of moral values in investing. *European Accounting Review*, 34(2), 841–871. <https://doi.org/10.1080/09638180.2024.2293349>
- Goerzen, A., Van Assche, A., Zhan, J. X., & Zhang, L. (2025). Global sustainability reporting standards and the future of international business. *Journal of International Business Policy*. Advance online publication. <https://doi.org/10.1057/s42214-025-00221-8>
- Indartini, M., & Mutmainah. (2024). *Analisis data kuantitatif: Uji instrumen, uji asumsi klasik, uji korelasi dan regresi linier berganda*. Lakeisha.
- Indriastuti, M., & Chariri, A. (2021). The role of green investment and corporate social responsibility investment on sustainable performance. *Cogent Business & Management*, 8(1), 1960120. <https://doi.org/10.1080/23311975.2021.1960120>
- Murwijaya, I. (2025). Understanding the factors that influence stock prices on the IDX ESG Leaders. *Perbanas International Seminar on Economics, Business, Management, Accounting and IT*, 3, 1–23.
- Nadias, N. E. (2025). Studi literatur: Pengaruh kinerja tata kelola terhadap praktik manajemen laba dalam konsep keberlanjutan. *Seminar Nasional Pariwisata dan Kewirausahaan (SNPK)*, 4, 839–843.
- Noviyanti, E. A., Rahayu, C. W. E., & Rahmawati, C. H. T. (2021). Financial performance and stock price: Another review on banks listed in Indonesia Stock Exchange. *Journal of Management and Business Environment (JMBE)*, 3(1), 70.
- Permana, N., Qalbia, F., & Kusnanto, E. (2025). Complexity, clarity, and earnings management: The impact of financial report obfuscation on investor perception and stock valuation. *International Journal of Management, Accounting & Finance (KBIJMAF)*, 2(2).
- Prayoga, H., Dharma, F., Sukmasari, D., & Suhendro, S. (2022). The effect of sports performance and financial performance on European soccer club stock prices. *Asian Journal of Economics, Business, and Management*, 1(2), 92–99.
- Sadowski, A., Comporek, M., Osińska, M., Walińska, E., & Engelseth, P. (2025). Earnings management among industries: Between the old and new economies. *Technological and Economic Development of Economy*, 31(2), 364–387. <https://doi.org/10.3846/tede.2025.25418>
- Sagbakken, H. F., Isataeva, A., Overland, I., Pranadi, A. D., Suryadi, B., & Vakulchuk, R. (2021). Local and global aspects of coal in the ASEAN countries. In *Handbook of sustainable politics and economics of natural resources* (pp. 45–63). Edward Elgar Publishing.

- Samosir, D. K. B. M. T., Tambun, S., & Pebriana, H. (2025). Pengaruh kecurangan laporan keuangan, kualitas laba dan komisaris independen terhadap nilai perusahaan dengan sustainability disclosure sebagai pemoderasi. *Media Akuntansi Perpajakan*, 10(1), 62–73.
- Suhadak, Mangesti Rahayu, S., & Handayani, S. R. (2020). GCG, financial architecture on stock return, financial performance and corporate value. *International Journal of Productivity and Performance Management*, 69(9), 1813–1831. <https://doi.org/10.1108/IJPPM-10-2019-0482>
- Syafii, M., Ulum, B., Rusdiyanto, S. P., Rahayu, D. I., & Syasindy, N. B. (2020). The effect of financial performance on the company's share price: A case study Indonesian. *European Journal of Molecular & Clinical Medicine*, 7(8), 1055–1071.
- Yadav, M., Dhingra, B., Batra, S., Saini, M., & Aggarwal, V. (2025). ESG scores and stock returns during COVID-19: An empirical analysis of an emerging market. *International Journal of Social Economics*, 52(3), 390–405. <https://doi.org/10.1108/IJSE-09-2023-0620>
- Zhang, C., & Hsu, W.-L. (2025). ESG rating divergence and stock price crash risk. *International Journal of Financial Studies*, 13(3), 147. <https://doi.org/10.3390/ijfs13030147>
- Zhou, L. (2024). How the financial performance of coal mining & metal, and mineral mining companies in Indonesia's stock market from 2017 to 2022 influenced their stock prices. *BASKARA: Journal of Business and Entrepreneurship*, 6(2), 240–252.