

The Effect of Environmental Performance and Green Supply Chain Management on Financial Performance: A Study of Mining Sector Companies Listed on the Indonesia Stock Exchange (2017–2025)

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Abstract

This study aims to analyze the effect of Environmental Performance and Green Supply Chain Management (GSCM) on the financial performance of mining sector companies listed on the Indonesia Stock Exchange (IDX) during the 2017–2025 period. A quantitative associative design was employed. The population comprised all mining sector companies listed on the IDX during the observation period (42 companies), from which 13 companies were selected using purposive sampling based on the consistent, complete annual publication of financial reports, sustainability reports, and PROPER environmental rating participation, yielding 117 firm-year observations. Data were obtained from annual reports, sustainability reports, and IDX publications, and analyzed using multiple linear regression in SPSS. Environmental Performance was measured through PROPER ratings (gold = 5 to black = 1), GSCM through a disclosure index (items disclosed/total indicators), and financial performance through Return on Assets (ROA). The classical assumption tests (normality, multicollinearity, heteroscedasticity, and autocorrelation) were satisfied. Results show that Environmental Performance has a positive and significant effect on financial performance ($\beta = 0.055$, $t = 3.399$, Sig. = 0.001), and GSCM also has a positive and significant effect on financial performance ($\beta = 0.652$, $t = 9.228$, Sig. < 0.001). Simultaneously, Environmental Performance and GSCM significantly affect financial performance ($F = 61.592$, Sig. < 0.001), explaining 51.1% of its variance ($R^2 = 0.511$). These findings indicate that stronger environmental performance and more effective GSCM implementation can enhance corporate financial performance, supporting Stakeholder, Legitimacy, and Signaling theories; mining companies are therefore encouraged to strengthen environmental management practices and optimize GSCM implementation as a strategy to support sustainability while improving financial performance.

Keywords: Environmental Performance, Green Supply Chain Management, Financial Performance, Mining Companies

1. Introduction

The mining sector is a strategic pillar of the Indonesian economy, contributing significantly to state revenue, exports, and employment. The market value of Indonesia's mining sector continued to rise, reaching IDR 246,612.40 billion in the fourth quarter of 2025, up from IDR 237,213.00 billion in the third quarter of 2025. At the same time, the sector is widely recognized as one of the largest sources of environmental risk, including water pollution, land degradation, carbon emissions, and ecosystem disruption; data from the Indonesian Forum for the Environment (WALHI) indicate that land-use change from mining operations has contributed more than 760 million tons of CO₂ emissions. This tension between economic contribution and environmental impact makes environmental management not merely a regulatory obligation but a strategic necessity for mining companies seeking to sustain their business over the long term.

Within this context, Environmental Performance and Green Supply Chain Management (GSCM) have emerged as key strategic levers. Environmental performance reflects the extent to which a company fulfills its responsibility for environmental sustainability through waste management, compliant disposal mechanisms, and strategies to reduce negative environmental impact; in Indonesia, this is commonly assessed through the government's PROPER (Corporate Performance Rating Assessment Program in Environmental Management) rating system. GSCM, meanwhile, refers to the integration of environmental principles across the entire supply chain, from design and procurement to manufacturing, distribution, and waste management.

Prior empirical evidence on the relationship between these practices and financial performance remains mixed. Some studies find that environmental performance and GSCM meaningfully enhance competitive advantage, cost efficiency, and financial outcomes, while others find that green practices do not always translate directly into improved financial or operational performance, particularly where implementation remains partial or unsupported by management commitment, system integration, and technological readiness. This inconsistency, combined with the mining sector's distinctive position as both an economically vital and environmentally high-risk industry, motivates renewed empirical investigation specifically within this sector.

Accordingly, this study aims to examine: (1) the effect of Environmental Performance on the financial performance of mining sector companies listed on the IDX during 2017–2025; (2) the effect of Green Supply Chain Management on financial performance; and (3) the simultaneous effect of Environmental Performance and GSCM on financial performance. By focusing on the mining sector across an extended nine-year observation window, this study aims to provide updated, sector-specific empirical evidence to inform corporate sustainability strategy, investor decision-making, and environmental policy.

2. Literature Review

Environmental Performance

Environmental performance reflects the extent to which a company fulfills its responsibility for maintaining environmental sustainability by managing the impacts arising from its operational activities, including waste treatment, compliant disposal mechanisms, and strategies to reduce negative environmental impact. In Indonesia, environmental

performance is commonly measured through the PROPER rating system, scored from gold (5) to black (1) (Husda et al., 2023).

Green Supply Chain Management

Green Supply Chain Management refers to the integration of environmental principles throughout the entire supply chain — from design, procurement, and manufacturing to distribution and waste management. In this study, GSCM is measured as a disclosure index: the ratio of disclosed GSCM items to total indicators (Novitasari et al., 2021).

Financial Performance

Financial performance is an assessment of a company's financial condition based on financial statements prepared in accordance with applicable standards. This study measures financial performance through Return on Assets (ROA), calculated as net profit divided by total assets (Safitri et al., 2024).

Prior Research

Several prior studies inform this research. Maharani and Bastian (2025) found that GSCM has a positive and significant effect on competitive advantage, suggesting that sustainable raw-material use, energy efficiency, and waste management create valuable market differentiation. Yulita (2019) similarly found that green supply chain management positively affects business performance through cost efficiency, customer-relationship effectiveness, and environmentally based differentiation. However, Wardhani (2025) found that green practice adoption did not always significantly bridge the relationship with operational performance, and Sherlyna and Murwaningsari (2023) similarly found that green practices do not necessarily improve operational performance without complementary factors such as management commitment, system integration, and technological readiness — suggesting that GSCM's effectiveness depends on the depth of implementation and strategic alignment. Rohdayatin et al. (2018) found that GSCM significantly affects environmental performance among restaurants in Malang, though environmental performance did not mediate the relationship between GSCM and financial performance, indicating that green practices do not always translate directly into financial gains, particularly where short-term profit orientation limits sustainability integration. Andreffe Chlearesta and Kurniawati Penti (2024) found that environmental performance has both direct and sustained effects on company performance, extending into subsequent periods. These studies collectively confirm the theoretical relevance of environmental performance and GSCM to financial outcomes while revealing inconsistent findings across sectors and contexts — a gap this study addresses by focusing specifically and comprehensively on Indonesia's mining sector over an extended nine-year window.

Conceptual Framework and Hypotheses

This study draws on three complementary theoretical perspectives. Stakeholder Theory holds that companies are responsible not only to shareholders but to all stakeholders, including communities, government, consumers, and the environment; demonstrating strong environmental management builds stakeholder trust, which can enhance reputation, expand investment opportunities, and increase customer loyalty. Legitimacy Theory explains that companies seek to maintain public legitimacy through operations that account for social and environmental dimensions, with strong environmental performance signaling regulatory compliance and sustainability commitment. Signaling Theory suggests that environmental performance and GSCM disclosure send positive signals to investors and markets regarding a

company's prospects, risk management maturity, and sustainability commitment. Building on this framework and the prior research reviewed above, this study proposes the following hypotheses:

H1: Environmental Performance has a positive effect on financial performance.

H2: Green Supply Chain Management has a positive effect on financial performance.

H3: Environmental Performance and Green Supply Chain Management simultaneously affect financial performance.

3. Research Methods

Research Design

This study employs a quantitative method with an associative approach, using secondary panel data to examine the effect of Environmental Performance and Green Supply Chain Management on the financial performance of mining sector companies listed on the Indonesia Stock Exchange during 2017–2025.

Population and Sample

The population comprised all 42 mining sector companies listed on the IDX during 2017–2025. Using purposive sampling, companies were selected based on three criteria: (1) consistent listing on the IDX throughout the observation period; (2) regular, complete annual publication of financial statements and sustainability reports throughout 2017–2025 (13 companies excluded); and (3) consistent participation in the PROPER environmental rating program throughout the same period (16 companies excluded). This process yielded 13 qualifying companies — including PT Adaro Energi Tbk, PT Bukit Asam Tbk, PT Aneka Tambang Tbk, PT Vale Indonesia Tbk, and nine others — observed across 9 years, producing 117 firm-year observations.

Data Source and Collection

This study relies on secondary data obtained through documentation: annual reports and sustainability reports of sample companies for 2017–2025, accessed via company websites and the Indonesia Stock Exchange.

Operational Variables

Environmental Performance (X1) was measured through PROPER ratings, scored gold = 5, green = 4, blue = 3, red = 2, and black = 1 (Husda et al., 2023), on a ratio scale. Green Supply Chain Management (X2) was measured as a disclosure index: total items disclosed divided by total indicators (Novitasari et al., 2021), on a ratio scale. Financial Performance (Y) was measured through Return on Assets: net profit divided by total assets, multiplied by 100% (Safitri et al., 2024), on a ratio scale.

Data Analysis Technique

Data were analyzed using SPSS through descriptive statistics (mean, minimum, maximum, standard deviation), classical assumption testing, and multiple linear regression. The classical assumption tests included normality (Kolmogorov-Smirnov test, with residuals considered normally distributed if significance > 0.05, supported by histogram and P-P plot inspection), multicollinearity (tolerance and VIF, with multicollinearity indicated by tolerance < 0.10 or VIF > 10), heteroscedasticity (Glejser test and scatterplot, with heteroscedasticity indicated by significance < 0.05), and autocorrelation (Run Test, with autocorrelation indicated by significance < 0.05). The regression model applied was $Y = a + \beta_1 EP + \beta_2 GSCM + e$, where Y is financial performance (ROA), EP is Environmental Performance, GSCM is Green Supply Chain Management, a is the constant, β are regression coefficients, and e is the error term.

Hypotheses were tested through the partial t-test (significant if Sig. < 0.05), the simultaneous F-test (significant if Sig. < 0.05), and the coefficient of determination (R^2).

4. Results and Discussion

Descriptive Statistics

Based on 117 firm-year observations, Environmental Performance recorded a mean of 3.9573 with a standard deviation of 0.71188, indicating a generally high and relatively homogeneous level of environmental performance among sample companies. Green Supply Chain Management recorded a mean of 0.8991 with a standard deviation of 0.16321, indicating high GSCM implementation with low data dispersion. Financial Performance (ROA) recorded a mean of 0.1654 with a standard deviation of 0.14841, indicating relatively low but stable financial performance across the sample. Across all three variables, standard deviations smaller than their respective means indicate relatively low data dispersion and a reasonably homogeneous sample, supporting the reliability of the subsequent regression analysis.

Classical Assumption Tests

The normality test (Kolmogorov-Smirnov) produced a significance value of 0.095, exceeding the 0.05 threshold, and was further supported by a bell-shaped residual histogram and a P-P plot closely following the diagonal line — confirming that model residuals are normally distributed. The multicollinearity test showed tolerance values of 0.927 and VIF values of 1.079 for both Environmental Performance and GSCM, both well within the acceptable range (tolerance > 0.10; VIF < 10), indicating no multicollinearity. The heteroscedasticity test (Glejser method) produced significance values of 0.254 for Environmental Performance and 0.163 for GSCM, both exceeding 0.05, and the residual scatterplot showed no discernible pattern, confirming the absence of heteroscedasticity. The autocorrelation test (Durbin-Watson) produced a value of 1.736, falling within the acceptable range of 1.5–2.5, confirming no autocorrelation. Together, these results confirm that the regression model satisfies the classical assumptions required for multiple linear regression.

Multiple Linear Regression Analysis

Table 1. Multiple Linear Regression and t-Test Results

Model	B (β)	t	Sig.
(Constant)	0.057	—	—
Environmental Performance (X1)	0.055	3.399	0.001
Green Supply Chain Management (X2)	0.652	9.228	< 0.001

Source: SPSS output, 2026. Dependent Variable: Financial Performance (ROA).

The resulting regression equation is Financial Performance = 0.057 + 0.055(Environmental Performance) + 0.652(Green Supply Chain Management). The constant of 0.057 indicates the baseline level of financial performance when both independent variables are zero. The Environmental Performance coefficient of 0.055 indicates that each one-unit increase in environmental performance is associated with a 0.055-unit increase in financial performance, holding GSCM constant. The GSCM coefficient of 0.652 indicates a substantially larger effect: each one-unit increase in GSCM is associated with a 0.652-unit increase in financial performance, holding environmental performance constant — indicating that GSCM implementation exerts a considerably more dominant influence on financial performance than environmental performance alone.

Hypothesis Testing

Partial t-test: Environmental Performance produced $t = 3.399$ with $\text{Sig.} = 0.001 (< 0.05)$, so H1 is accepted — Environmental Performance has a positive and significant effect on financial performance. Green Supply Chain Management produced $t = 9.228$ with $\text{Sig.} < 0.001 (< 0.05)$, so H2 is accepted — GSCM has a positive and significant effect on financial performance.

Table 2. F-Test (Simultaneous) and Coefficient of Determination

Statistic	Value
F-count	61.592
Sig. (F-test)	< 0.001
R Square (R ²)	0.511

Source: SPSS output, 2026. Predictors: (Constant), Environmental Performance, Green Supply Chain Management; Dependent Variable: Financial Performance.

The F-test produced $F = 61.592$ with $\text{Sig.} < 0.001 (< 0.05)$, so H3 is accepted: Environmental Performance and Green Supply Chain Management simultaneously have a positive and significant effect on financial performance. The R Square value of 0.511 indicates that the two independent variables jointly explain 51.1% of the variance in financial performance, with the remaining 48.9% attributable to factors outside the model — placing the model in the “moderate” explanatory category (33–66%).

Discussion

The positive and significant effect of Environmental Performance on financial performance ($\beta = 0.055$, $t = 3.399$, $\text{Sig.} = 0.001$) indicates that mining companies with stronger environmental performance tend to achieve higher financial performance. This finding is particularly meaningful given the mining sector's dual position as both an economically strategic and environmentally high-risk industry: as the sector's market value continues to grow while its environmental footprint remains substantial, sound environmental management appears not merely as regulatory compliance but as a strategic lever supporting financial outcomes. This result is consistent with Andreffe Chlearesta and Kurniawati Penti (2024), who found that environmental performance affects company performance not only directly but sustainably over subsequent periods, and supports Stakeholder Theory and Legitimacy Theory: companies demonstrating strong environmental commitment build stakeholder trust and public legitimacy, which in turn can enhance reputation, expand investment opportunities, and support long-term financial performance.

The positive and significant effect of GSCM on financial performance ($\beta = 0.652$, $t = 9.228$, $\text{Sig.} < 0.001$) — notably larger than that of Environmental Performance — indicates that integrating environmental principles across the supply chain is the more dominant financial performance driver among the two practices examined. This finding aligns with Maharani and Bastian (2025) and Yulita (2019), both of whom found GSCM to positively affect competitive advantage and business performance through cost efficiency and environmentally based differentiation. It contrasts, however, with Wardhani (2025) and Sherlyna and Murwaningsari (2023), who found GSCM's effect on operational performance inconsistent absent complementary management commitment and system integration; the strong effect observed here suggests that, within this sample of mining companies meeting rigorous sustainability-reporting criteria, GSCM implementation is comparatively mature and well-integrated into broader business strategy, consistent with Signaling Theory's premise that visible sustainability practices signal favorable prospects to investors and markets.

The simultaneous effect of Environmental Performance and GSCM, jointly explaining 51.1% of financial performance variance, reinforces their combined strategic importance while indicating that other factors — such as Corporate Social Responsibility, Good Corporate Governance, firm size, or leverage — also meaningfully shape financial outcomes and warrant attention in future research. Compared with Rohdayatin et al. (2018), who found that environmental performance did not mediate the GSCM–financial performance relationship among restaurants, the present findings suggest that within the mining sector — where environmental risk and regulatory scrutiny are considerably more pronounced — both environmental performance and GSCM translate more directly into financial outcomes, likely reflecting the sector's heightened stakeholder attention and legitimacy pressures relative to lower-risk industries.

5. Conclusion

This study examined the effect of Environmental Performance and Green Supply Chain Management on financial performance among 13 mining sector companies listed on the Indonesia Stock Exchange during 2017–2025 (117 firm-year observations). Three conclusions emerge. First, Environmental Performance has a positive and significant effect on financial performance, indicating that companies with stronger environmental performance tend to achieve better financial outcomes. Second, Green Supply Chain Management has a positive and significant effect on financial performance, with sustainable supply-chain practices supporting operational efficiency and added value that enhance financial outcomes. Third, Environmental Performance and Green Supply Chain Management simultaneously have a positive and significant effect on financial performance ($F = 61.592$, $\text{Sig.} < 0.001$), jointly explaining 51.1% of its variance ($R^2 = 0.511$). These findings collectively reinforce Legitimacy Theory, Stakeholder Theory, and Signaling Theory: companies committed to environmental management and sustainability gain public legitimacy, build stakeholder trust, and send positive signals to investors regarding future prospects.

These findings suggest that mining companies should continue improving environmental management quality through emission reduction, more effective waste management, more efficient energy use, and regulatory compliance, while strengthening GSCM implementation across the full supply chain from raw-material procurement through post-use product management. Investors are encouraged to consider sustainability indicators alongside conventional financial metrics when making investment decisions, while policymakers are encouraged to strengthen oversight of corporate environmental programs, improve sustainability-reporting transparency, and provide incentives for consistent sustainable business practice. Future research is encouraged to incorporate additional variables such as Green Accounting, Corporate Social Responsibility, Sustainability Report Disclosure, Good Corporate Governance, firm size, and leverage, and to extend the analysis to other industry sectors and longer observation periods to develop a more comprehensive understanding of the determinants of corporate financial performance.

REFERENCES

- Andrefe Chlearesta, & Kurniawati Penti. (2024). The direct and lagged effect of environmental performance on company performance. *Jurnal Akuntansi dan Keuangan*, 26(1), 15–30.
- Ghozali, I. (2018). *Aplikasi analisis multivariate dengan program IBM SPSS 25*. Badan Penerbit Universitas Diponegoro.

- Ghozali, I. (2021). Aplikasi analisis multivariate dengan program IBM SPSS 26. Badan Penerbit Universitas Diponegoro.
- Husda, N. E., et al. (2023). Environmental performance and PROPER rating: A measurement framework. *Jurnal Akuntansi Lingkungan*, 9(1), 10–22.
- Maharani, D., & Bastian, E. (2025). Pengaruh green supply chain management terhadap keunggulan bersaing perusahaan. *Jurnal Manajemen Operasi*, 13(1), 40–55.
- Novitasari, M., et al. (2021). Green supply chain management disclosure index dan kinerja perusahaan. *Jurnal Akuntansi dan Bisnis*, 21(2), 133–148.
- Prihadi, T. (2019). Analisis laporan keuangan: Konsep dan aplikasi. Gramedia Pustaka Utama.
- Rohdayatin, A. E., et al. (2018). Pengaruh green supply chain management terhadap kinerja lingkungan dan kinerja finansial pada sektor restoran di Kota Malang. *Jurnal Bisnis dan Manajemen*, 5(2), 88–101.
- Safitri, N., et al. (2024). Pengukuran kinerja keuangan melalui return on assets. *Jurnal Akuntansi Keuangan*, 12(1), 20–32.
- Sherlyna, & Murwaningsari, E. (2023). Green practices dan kinerja operasional: Peran faktor pendukung implementasi. *Jurnal Akuntansi Multiparadigma*, 14(1), 55–70.
- Sugiyono. (2019). Metode penelitian kuantitatif, kualitatif, dan R&D. Alfabeta.
- Wardhani, R. (2025). Adopsi praktik ramah lingkungan dan kinerja operasional perusahaan. *Jurnal Manajemen dan Bisnis*, 13(1), 60–74.
- Yulita, I. (2019). Manajemen rantai pasok hijau dan kinerja bisnis. *Jurnal Ekonomi dan Bisnis*, 7(2), 95–108.