

# The Effect of Green Accounting, Environmental Performance, and CSR on Profitability in IDX Mining Companies (2020–2024)

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**Abstract**— This study investigates the impact of green accounting, environmental performance, and corporate social responsibility (CSR) on profitability of mining companies listed on the Indonesia Stock Exchange during 2020–2024. Using purposive sampling, seven companies with 35 firm-year observations were analyzed through multiple linear regression in SPSS. The findings reveal that green accounting significantly but negatively affects profitability, environmental performance has a significant positive effect, while CSR shows no significant influence. Together, the three variables significantly impact profitability, emphasizing the importance of integrating sustainability practices into corporate financial strategies.

**Keywords**— Green Accounting, Environmental Performance, Corporate Social Responsibility, Profitability, Mining.

## I. INTRODUCTION

In Indonesia, the mining sector plays a crucial role in supporting national economic growth, contributing significantly to state revenue, foreign exchange, and employment. However, mining activities also generate substantial environmental and social challenges, including land degradation, water pollution, and conflicts with local communities. As sustainability issues become increasingly important, companies are required not only to pursue profitability but also to address environmental responsibility and social accountability.

To respond to these challenges, concepts such as green accounting, environmental performance, and corporate social responsibility (CSR) have become central in evaluating corporate sustainability. Green accounting integrates environmental costs into financial reporting, enabling companies to disclose the real impact of their operations. Environmental performance, often measured through government initiatives such as PROPER, reflects how effectively a company manages ecological risks. Meanwhile, CSR programs strengthen relationships with stakeholders by demonstrating the company's commitment to social welfare and community development.

Nevertheless, the extent to which these sustainability practices affect corporate profitability remains debated. While some studies suggest that investments in environmental and social initiatives improve reputation and competitiveness, others argue that such initiatives impose additional costs that reduce short-term financial performance. This gap highlights the importance of empirical research in industries with high environmental impact, such as mining.

This study aims to examine the effect of green accounting, environmental performance, and CSR on profitability

(measured by Return on Assets) in mining companies listed on the Indonesia Stock Exchange during 2020–2024. By employing Stakeholder Theory and Legitimacy Theory as the theoretical foundation, this research seeks to explain how sustainability practices influence financial outcomes.

The findings of this study are expected to provide both theoretical contributions by enriching the literature on sustainability accounting and practical implications for mining companies in balancing compliance, environmental stewardship, and financial performance. In doing so, the research highlights the strategic importance of integrating sustainability into corporate decision-making to ensure long-term competitiveness.

## II. LITERATURE REVIEW

One of the widely adopted frameworks for explaining the relationship between corporate practices and financial performance is Stakeholder Theory and Legitimacy Theory. These perspectives emphasize that a company's long-term success depends not only on generating profit but also on meeting the expectations of stakeholders and society at large. In industries with high environmental impact, such as mining, these theories provide strong justification for integrating environmental and social considerations into business strategies.

### 1. Green Accounting

Green accounting refers to the process of recognizing, measuring, and disclosing environmental costs in corporate financial reporting. It enables companies to account for expenses such as waste management, pollution control, land rehabilitation, and other sustainability-related initiatives. By internalizing these costs, companies improve transparency and demonstrate accountability to stakeholders. While green accounting may impose additional expenses that reduce short-term profitability, it can also create long-term value through efficiency gains, reduced regulatory risks, and enhanced corporate reputation.

### 2. Environmental Performance

Environmental performance reflects how effectively a company manages its ecological footprint. In Indonesia, environmental performance is commonly measured through the PROPER rating system issued by the Ministry of Environment and Forestry, which evaluates compliance and excellence in environmental management. Strong environmental performance signals a company's commitment to sustainability, reduces risks

of sanctions or community conflict, and may attract socially responsible investors, thereby supporting financial performance.

### 3. Corporate Social Responsibility (CSR)

CSR encompasses initiatives aimed at addressing the social and economic well-being of communities affected by corporate activities. In the mining sector, CSR often involves programs such as community development, infrastructure support, education, and health services. CSR is mandated by Indonesian law for companies utilizing natural resources, making it both a regulatory requirement and a strategic tool to build trust and legitimacy. While CSR may not always produce immediate financial gains, it strengthens long-term stakeholder relations and enhances a company's social license to operate.

### 4. Profitability

Profitability, typically measured through indicators such as Return on Assets (ROA), is a central metric of financial performance. It reflects how efficiently a company uses its assets to generate earnings. Profitability serves not only as a measure of short-term financial health but also as a foundation for sustainable growth. The relationship between profitability and sustainability practices is complex: while green accounting and CSR may initially increase costs, environmental performance and stakeholder trust can contribute to improved profitability in the long run.

These concepts are interrelated in shaping the financial outcomes of mining companies. Green accounting provides transparency by recognizing and disclosing environmental costs, while environmental performance demonstrates how effectively companies manage ecological impacts. CSR reflects the broader social responsibility of firms in addressing community needs and sustaining stakeholder trust. Together, these practices not only determine a company's legitimacy and reputation but also influence its profitability. Although the short-term financial effects may vary, where environmental costs can reduce immediate earnings, strong environmental performance and well-executed CSR programs are expected to enhance long-term profitability by improving efficiency, reducing risks, and strengthening stakeholder relations.

#### A. Prior Research on Sustainability and Profitability

Previous studies show mixed findings. Some research indicates that green accounting positively influences profitability by enhancing efficiency and reputation, while others report a negative impact due to high implementation costs. Similarly, environmental performance has often been found to correlate positively with profitability, as companies with better ecological management gain investor trust and competitive advantage. For CSR, findings are inconsistent: certain studies report significant positive effects on financial performance, while others find no direct impact, suggesting its benefits are more intangible and long-term in nature.

#### B. Research Gap

Although sustainability accounting and performance have been extensively studied, research focusing on the Indonesian mining sector remains limited. Most studies examine manufacturing or energy sectors, leaving the unique

characteristics of mining underexplored. Moreover, previous findings show inconsistent results regarding the effect of green accounting and CSR on profitability. Therefore, this study seeks to fill the gap by empirically testing the influence of green accounting, environmental performance, and CSR on profitability in Indonesian mining companies. The findings aim to strengthen theoretical understanding while offering practical guidance for companies to balance sustainability and financial objectives.

### III. METHODOLOGY

This study is designed to provide a holistic understanding of how sustainability practices—green accounting, environmental performance, and corporate social responsibility (CSR), influence the profitability of mining companies in Indonesia. Guided by Stakeholder Theory and Legitimacy Theory, the research adopts a quantitative approach using secondary data from company reports and government publications. Profitability, measured by Return on Assets (ROA), serves as the dependent variable, while green accounting, environmental performance, and CSR are the independent variables. Together, these constructs capture the multi-dimensional nature of sustainability integration within the mining sector.

The research population consisted of 64 mining companies listed on the Indonesia Stock Exchange between 2020 and 2024. However, not all firms met the criteria required for analysis, such as the consistent publication of annual reports, sustainability reports, and environmental performance ratings. Therefore, purposive sampling was applied, resulting in a final sample of seven companies observed over five years, yielding 35 firm-year data points. This sample size reflects both the depth of data availability and the focus on firms actively engaged in sustainability disclosure.

Data collection relied on three main sources. Financial indicators and CSR disclosures were initially gathered from official business and IDX websites, which publish annual reports and sustainability reports that have been audited. Second, environmental performance was assessed using the PROPER index issued by the Ministry of Environment and Forestry, which evaluates firms across five performance levels ranging from "very poor" to "excellent." Third, green accounting practices were identified using a dummy variable approach, with scores assigned based on whether environmental costs and related disclosures were reported. By combining financial, environmental, and social dimensions, the dataset ensures a comprehensive representation of each company's sustainability profile.

The operationalization of variables was carefully aligned with prior literature. Profitability (ROA) was calculated as net income divided by total assets, reflecting how efficiently companies utilize resources to generate returns. Green accounting was coded as 1 for companies reporting environmental expenditures and 0 otherwise, consistent with environmental accounting studies. Environmental performance followed the PROPER scoring scale from 1 to 5, while CSR was measured using disclosure ratios derived from sustainability reporting indicators. These definitions allowed for objective and

replicable measurement across the sample.

For analysis, multiple linear regression was employed using IBM SPSS 30. This method was chosen because it enables the simultaneous assessment of both individual and joint effects of the independent variables on profitability. To ensure the robustness of the results, classical assumption tests, normality, multicollinearity, heteroskedasticity, and autocorrelation—were conducted prior to regression analysis. Only after these conditions were satisfied was the regression model interpreted. Hypothesis testing used a 5% significance level, with hypotheses accepted if the t-statistics exceeded the critical value and p-values fell below 0.05.

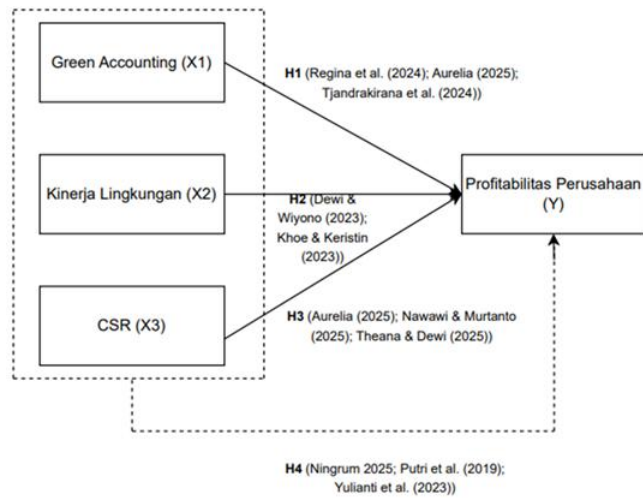


Figure 1: Conceptual Framework

Based on the conceptual model, the following hypotheses were proposed:

- H1: Green accounting positively influences profitability.
- H2: Environmental performance positively influences profitability.
- H3: Corporate social responsibility positively influences profitability.
- H4: Green accounting, environmental performance, and CSR simultaneously influence profitability.

By integrating sustainability measures, profitability outcomes, and rigorous statistical analysis, the methodological framework of this research captures both direct and systemic relationships. More than testing isolated variables, the approach provides a holistic view of how sustainability practices interact with financial performance in resource-intensive industries. This design ensures that the findings are not only statistically valid but also practically relevant for mining companies striving to balance profitability with environmental stewardship and social responsibility.

#### IV. RESULT

The data used in this chapter is financial and sustainability data obtained from seven mining firms that were listed on the Indonesia Stock Exchange between 2020 and 2024. The analysis is structured to provide a comprehensive view of the descriptive statistics of each research variable, the results of

classical assumption testing, regression analysis, and hypothesis testing. The discussion integrates the empirical findings with the theoretical framework to highlight the influence of sustainability practices on profitability.

TABLE 1. Green Accounting Results

Company	2020	2021	2022	2023	2024
Adaro Energy Indonesia, Tbk.	1	1	1	1	1
Indo Tambangraya Megah, Tbk.	0.6	0.8	1	1	0.8
Bukit Asam, Tbk.	1	1	1	1	1
Aneka Tambang, Tbk.	0.8	0.8	0.8	1	1
Bumi Resources Minerals, Tbk.	1	1	1	1	1
Vale Indonesia, Tbk.	0.8	0.8	0.8	0.8	1
Merdeka Copper Gold, Tbk.	0.8	0.8	0.8	0.8	0.8

Most companies consistently disclosed environmental costs such as reclamation, waste treatment, and pollution management. Firms like Adaro, Bukit Asam, and Bumi Resources reported these costs continuously from 2020–2024, while others such as Indo Tambangraya and Aneka Tambang showed partial or fluctuating disclosure.

TABLE 2. Environmental Performance Results

Company	2020	2021	2022	2023	2024
Adaro Energy Indonesia, Tbk.	5	5	5	5	5
Indo Tambangraya Megah, Tbk.	3	4	5	5	4
Bukit Asam, Tbk.	5	5	5	5	5
Aneka Tambang, Tbk.	4	4	4	5	5
Bumi Resources Minerals, Tbk.	5	5	5	5	5
Vale Indonesia, Tbk.	4	4	4	4	5
Merdeka Copper Gold, Tbk.	4	4	4	4	4

PROPER ratings reveal strong environmental management practices among leading firms, with companies such as Adaro, Bukit Asam, and Bumi Resources maintaining gold or green ratings consistently. Meanwhile, companies like Indo Tambangraya and Vale Indonesia demonstrated gradual improvement over time, indicating efforts to enhance compliance and sustainability.

These differences in PROPER ratings highlight how environmental performance can serve as both a compliance tool and a competitive differentiator. Companies with consistently high ratings not only demonstrate strong environmental governance but also send positive signals to investors, regulators, and local communities about their commitment to sustainability. Conversely, firms showing gradual improvement illustrate that environmental management is a dynamic process that requires continuous investment, adaptation to regulatory standards, and responsiveness to stakeholder expectations. This variation underscores the importance of environmental performance as a measurable factor that directly contributes to corporate legitimacy and, as the regression results confirm, has a significant positive influence on profitability.

CSR expenditure relative to company revenue shows considerable variation. While some companies like Merdeka Copper Gold reported large CSR allocations in 2023–2024, others such as Indo Tambangraya and Vale allocated smaller percentages. This suggests that CSR intensity is influenced not only by regulatory compliance but also by corporate strategy and profitability levels.

TABLE 3. CSR Results

Company	2020	2021	2022	2023	2024
Adaro Energy Indonesia, Tbk.	4.44%	0.64%	0.38%	0.45%	2.47%
Indo Tambangraya Megah, Tbk.	3.72%	0.63%	0.54%	0.73%	0.41%
Bukit Asam, Tbk.	4.56%	1.55%	1.36%	4.03%	7.18%
Aneka Tambang, Tbk.	9.67%	5.48%	3.26%	5.68%	4.21%
Bumi Resources Minerals, Tbk.	12.52%	0.13%	0.45%	1.45%	1.13%
Vale Indonesia, Tbk.	4.95%	1.57%	2.45%	1.35%	6.93%
Merdeka Copper Gold, Tbk.	11.42%	10.78%	5.25%	53.86%	57.24%

TABLE 4. Profitability Results

Company	2020	2021	2022	2023	2024
Adaro Energy Indonesia, Tbk.	2.49%	13.56%	26.26%	17.71%	22.14%
Indo Tambangraya Megah, Tbk.	3.26%	28.53%	45.43%	22.84%	15.61%
Bukit Asam, Tbk.	10.01%	22.25%	28.17%	16.23%	12.30%
Aneka Tambang, Tbk.	3.62%	5.66%	11.36%	7.18%	8.65%
Bumi Resources Minerals, Tbk.	0.69%	7.12%	1.27%	1.28%	2.18%
Vale Indonesia, Tbk.	3.58%	6.70%	7.54%	9.38%	1.82%
Merdeka Copper Gold, Tbk.	3.11%	2.61%	1.67%	0.11%	0.19%

Profitability (ROA) fluctuated significantly across companies and years. For instance, Indo Tambangraya recorded the highest ROA in 2022 (45.43%), while Merdeka Copper Gold reported very low returns in 2023–2024. These variations reflect the cyclical nature of the mining industry and the differing impacts of sustainability practices on financial outcomes.

TABLE 5. Normality Test

One-Sample Kolmogorov-Smirnov Test			
		Unstandardized Residual	
N		35	
Normal Parameters <sup>a,b</sup>	Mean	.0000000	
	Std. Deviation	8.79546479	
Most Extreme Differences	Absolute	.099	
	Positive	.099	
	Negative	-.052	
Test Statistic		.099	
Asymp. Sig. (2-tailed) <sup>c</sup>		.200 <sup>d</sup>	
Monte Carlo Sig. (2-tailed) <sup>e</sup>	Sig.	.516	
	99% Confidence Interval	Lower Bound	.503
		Upper Bound	.529

The four variables in this study, green accounting, environmental performance, CSR, and profitability—demonstrate interconnected yet distinct patterns. Green accounting reflects companies' commitment to disclosing environmental costs, though the intensity of disclosure varies across firms. Environmental performance shows a clearer trend, with some companies consistently achieving high ratings while others gradually improve, indicating ongoing efforts to strengthen compliance and sustainability practices. CSR

exhibits considerable variation, as firms allocate different levels of resources to community development and social initiatives, reflecting both regulatory obligations and strategic priorities. Profitability, meanwhile, fluctuates over time, influenced not only by market dynamics but also by how effectively companies balance financial goals with environmental and social responsibilities. Together, these variables illustrate that sustainability practices play a critical role in shaping financial outcomes in the mining sector.

TABLE 6. Multicollinearity Test

Coefficients <sup>a</sup>			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Green Accounting (X1)	.854	1.171
	Environmental Performance(X2)	.828	1.207
	CSR (X3)	.825	1.211
a. Dependent Variable: Profitability (Y)			

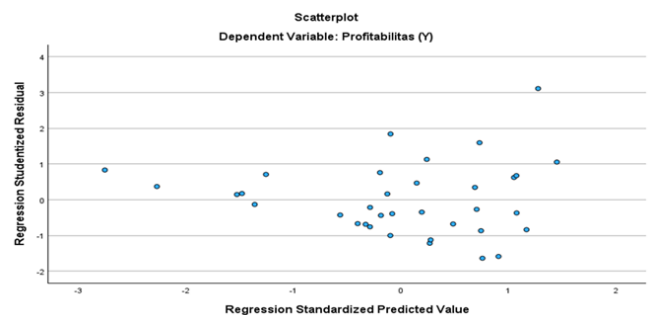


Figure 2: Scatterplot

TABLE 7. Autocorrelation Test

Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.548 <sup>a</sup>	.301	.233	9.21123	1.225
a. Predictors: (Constant), CSR (X3), Green Accounting (X1), Environmental Performance(X2)					
b. Dependent Variable: Profitability (Y)					

Before conducting regression analysis, a series of classical assumption tests were performed to ensure that the model produced unbiased and reliable estimates. The normality test using the Kolmogorov-Smirnov approach indicated a significance value greater than 0.05, which means that the residuals are normally distributed. This finding is important because a normally distributed error term allows for accurate significance testing in regression. The result is further supported by the residual scatterplot (Figure 2), which shows a random distribution of data points without forming a specific pattern. This randomness indicates that the variance of residuals is consistent across observations, confirming the absence of heteroskedasticity. Together, these findings suggest that the model satisfies the normality and homoscedasticity assumptions, both of which are fundamental for producing valid regression estimates.

The results of the multicollinearity test further reinforce the robustness of the model. All independent variables have tolerance values higher than 0.8, and the Variance Inflation Factor (VIF) values are significantly lower than the critical threshold of 10. This demonstrates that there is no strong

intercorrelation among the independent variables, green accounting, environmental performance, and CSR. Each variable contributes uniquely to explaining changes in profitability, ensuring that the regression coefficients are not distorted by overlapping information. In practical terms, this means that environmental disclosures, environmental performance scores, and CSR programs capture distinct aspects of corporate sustainability strategies, which together provide a fuller picture of their financial impact.

The autocorrelation test, measured using the Durbin-Watson statistic, produced a value of 1.225. This lies within the acceptable range, indicating that the residuals are independent from one observation to another. The absence of autocorrelation is critical, as it ensures that the regression model does not suffer from systematic errors that could bias the results. In the context of panel data covering multiple companies over five years, this finding provides reassurance that the model captures genuine relationships rather than being influenced by time-related dependencies in the data.

Overall, the combined results of the normality, multicollinearity, heteroskedasticity, and autocorrelation tests confirm that the regression model meets the key assumptions necessary for valid hypothesis testing. By ensuring that the model is statistically sound, the analysis provides a strong foundation for interpreting the effects of green accounting, environmental performance, and CSR on profitability. This methodological rigor enhances the reliability of both the partial and simultaneous regression results presented later in this chapter.

From a theoretical perspective, this robustness carries significant implications. Stakeholder Theory emphasizes that companies are accountable not only to shareholders but also to a broad set of stakeholders, including regulators, communities, and investors. Similarly, Legitimacy Theory posits that companies must align their practices with societal norms and expectations in order to maintain their license to operate. By establishing a valid regression model, this research provides a more credible test of how sustainability practices influence financial outcomes. The ability to empirically demonstrate the costs and benefits of green accounting, the reputational and operational advantages of strong environmental performance, and the long-term but sometimes intangible effects of CSR helps bridge the gap between theory and practice.

In the context of the mining sector, the importance of a rigorous model is even greater. Mining companies operate under intense scrutiny due to the environmental and social risks associated with their activities. Regulatory compliance, community relations, and environmental stewardship are not optional but integral to sustaining operations. Therefore, ensuring that the regression model is free from bias and distortion allows this research to provide meaningful insights into whether sustainability practices enhance or hinder profitability in a high-impact industry. The results of these assumption tests thus serve not merely as statistical validation but also as the foundation for drawing reliable conclusions about the balance between profitability and responsibility in the Indonesian mining sector.

TABLE 8. Regression Test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	-7.756	13.725		-.565	.576
	Green Accounting (X1)	<b>-7.012</b>	4.580	-.365	<b>2.244</b>	<b>.032</b>
	Environmental Performance(X2)	<b>6.531</b>	3.096	.348	<b>2.109</b>	<b>.043</b>
	CSR (X3)	<b>-.375</b>	.137	-.186	<b>1.127</b>	<b>.268</b>

a. Dependent Variable: Profitability (Y)

The regression analysis provides a comprehensive view of how sustainability practices influence profitability in mining companies. Green accounting shows a negative and significant effect, with a coefficient of  $B = -0.365$  ( $p = 0.032$ ). This indicates that companies disclosing environmental costs tend to experience a decline in short-term profitability, as expenditures for reclamation, pollution control, and waste management directly reduce reported earnings. Despite this negative impact, such practices remain vital for regulatory compliance and represent long-term investments in corporate legitimacy. Conversely, environmental performance demonstrates a positive and significant relationship with profitability, with a coefficient of  $B = 0.348$  ( $p = 0.043$ ). This result suggests that companies with higher PROPER ratings—reflecting stronger pollution prevention, efficient resource utilization, and environmental stewardship, benefit financially through enhanced reputation, improved stakeholder trust, and reduced operational risks. On the other hand, corporate social responsibility (CSR) yields a negative but statistically insignificant effect, with a coefficient of  $B = -0.186$  ( $p = 0.268$ ). This finding implies that while CSR programs contribute to community engagement and strengthen stakeholder relations, their financial benefits are not immediately realized and may remain intangible in the short term. Taken together, these results highlight the nuanced dynamics of sustainability practices, showing that while environmental performance directly supports profitability, green accounting imposes short-term financial costs, and CSR serves more as a strategic investment in long-term legitimacy rather than an immediate profit driver.

TABLE 9. Simultant Hypotheses Test

ANOVA <sup>a</sup>						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	1130.801	3	376.934	<b>4.443</b>	<b>.010<sup>b</sup></b>
	Residual	2630.247	31	84.847		
	Total	3761.048	34			

a. Dependent Variable: Profitability (Y)  
b. Predictors: (Constant), CSR (X3), Green Accounting (X1), Environmental Performance(X2)

The simultaneous test (Table 9) shows that green accounting, environmental performance, and CSR together have a significant effect on profitability ( $F = 4.443$ ,  $p = 0.010$ ). This indicates that while individual variables show varying levels of influence, collectively they shape financial outcomes, confirming the relevance of sustainability practices in determining profitability.

## V. CONCLUSION AND RECOMMENDATIONS

### A. Conclusion

This study examined the effect of green accounting, environmental performance, and corporate social responsibility (CSR) on the profitability of mining companies listed on the Indonesia Stock Exchange during 2020–2024. Using multiple linear regression, the results show that green accounting has a significant but negative impact on profitability. This indicates that while disclosure of environmental costs increases corporate accountability and transparency, it also creates additional expenses that reduce short-term earnings. Nevertheless, these practices remain important as a form of regulatory compliance and as part of long-term sustainability strategies.

Environmental performance is found to have a significant and positive effect on profitability. Companies with higher PROPER ratings benefit from greater stakeholder trust, reduced risk of regulatory sanctions, and enhanced competitiveness, which in turn improve financial outcomes. CSR, on the other hand, shows a negative but statistically insignificant effect on profitability. This finding suggests that CSR programs, although important for maintaining legitimacy and strengthening community relations, do not directly translate into short-term financial gains. Instead, their contribution is likely to be realized in the long run through reputational advantages and stakeholder goodwill.

Simultaneous testing confirms that green accounting, environmental performance, and CSR collectively influence profitability, emphasizing that financial performance in the mining sector is shaped not only by financial management but also by sustainability practices. These results affirm the propositions of Stakeholder Theory and Legitimacy Theory: firms that align their operations with social and environmental expectations can strengthen their legitimacy and secure long-term sustainability, even if short-term profitability is affected.

### B. Suggestion

On the basis of these findings, a number of suggestions can be made for future research and practice. First, since green accounting shows a negative effect on profitability, companies should not view environmental costs merely as a financial burden but as strategic investments. Strengthening reporting systems and adopting international sustainability standards could enhance efficiency, reduce long-term risks, and gradually improve profitability.

Second, the positive effect of environmental performance suggests that mining companies should consistently improve their ecological management practices, such as waste treatment, energy efficiency, and land reclamation. Maintaining or improving PROPER ratings can generate both reputational and financial benefits, making environmental performance a critical strategic focus.

Third, while CSR was not found to have a significant short-term impact, companies should continue developing programs that address community needs in ways that also align with business strategy. Long-term CSR initiatives, such as education, health, and infrastructure support, can foster stronger stakeholder trust and social legitimacy, which may indirectly

contribute to financial stability.

For future research, scholars are encouraged to expand the sample size beyond mining companies to include other sectors with different sustainability challenges, allowing for comparative analysis. Adding moderating or mediating variables, such as firm size, governance quality, or industry type, could also provide deeper insights into the dynamics between sustainability practices and profitability. Methodologically, future studies could adopt mixed methods or longitudinal designs to capture how the impact of sustainability evolves over time.

By implementing these recommendations, both researchers and practitioners can advance the understanding of sustainability accounting and its role in shaping profitability. For practitioners, the results serve as a reminder that profitability should not be pursued in isolation but balanced with environmental stewardship and social responsibility, ensuring long-term resilience and legitimacy in the mining sector.

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