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Linking Green Accounting to Financial Performance: The Role of CSR and Environmental Performance

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Abstract:
Research aims:
Empirical findings on the financial impact of green accounting, CSR, and environmental performance in Indonesian manufacturing firms remain inconsistent, especially in the post-pandemic period. To determine the effect of green accounting, CSR, environmental performance, and company size on financial performance of manufacturing companies.
Design/Methodology/Approach:
Quantitative explanatory research with a causal-verification approach, using panel data regression on 140 firm-year observations from 28 manufacturing companies listed on IDX over 2019–2023.
Research findings: Green accounting, CSR, and environmental performance significantly enhance ROA, suggesting environmental management integration improves profitability.
Theoretical contribution/ Originality: Theoretical contribution/Originality: This study provides one of the first multivariate panel-data tests that jointly examine green accounting, CSR disclosure, and PROPER-based environmental performance on ROA in Indonesian manufacturing firms, addressing inconsistent post-pandemic empirical findings.
Practitioner/Policy implication: Supports mandatory green accounting disclosure in annual reports; guides corporate investment in environmental systems.
Research limitation/Implication: Secondary data; sample limited to manufacturing sector; future research should expand to service sector and test mediating effects.

Keywords: green accounting, corporate social responsibility, environmental performance, financial performance.

Introduction

Environmental accountability has become a defining feature of contemporary corporate governance. In manufacturing industries, where environmental externalities are structurally embedded in production processes, the tension between profitability and ecological responsibility is particularly pronounced. Although firms are increasingly expected to disclose sustainability-related information, conventional accounting systems were not originally designed to internalize environmental costs in a systematic way. As a result, financial performance measures may overlook environmental risks and resource inefficiencies that ultimately affect long-term value creation (Schaltegger et al., 2006).

Green accounting (GA) seeks to address this limitation by integrating environmental cost identification, measurement, and disclosure into formal accounting practices. Rather than treating environmental expenditures as peripheral compliance costs, GA incorporates them into

managerial decision-making and performance evaluation systems. At the macro level, environmental–economic accounting frameworks adjust national income indicators to account for natural capital depletion (System of Environmental-Economic Accounting 2012: Central Framework, 2014). At the firm level, environmental management accounting enables companies to trace pollution prevention costs, resource consumption, and environmental liabilities, thereby improving cost transparency and operational efficiency (Burritt & Schaltegger, 2010). In theory, such internalization of environmental externalities should strengthen financial performance by reducing waste, mitigating regulatory risk, and enhancing stakeholder confidence.

However, the empirical relationship between sustainability-oriented accounting and profitability remains unsettled. While numerous studies report positive associations between environmental practices and financial outcomes (Montabon et al., 2007;Khamis et al., 2025;Boakye et al., 2020;Baah et al., 2021), others find that these effects diminish when conventional firm characteristics are controlled (Hossain et al., 2025). Meta-analytical evidence further suggests that sustainability performance relationships vary across institutional environments and industry structures (Friede et al., 2015). These mixed findings indicate that the financial consequences of environmental practices cannot be assumed to be uniform and may depend on how sustainability mechanisms are operationalized and combined.

A key limitation in the existing literature lies in the tendency to examine green accounting, corporate social responsibility (CSR), and environmental performance (EP) in isolation. Although CSR disclosure has been linked to enhanced stakeholder trust and reduced capital costs (Dhaliwal et al., 2011), and regulatory-based environmental performance measures have been associated with lower compliance risk, little attention has been given to their relative explanatory power when assessed simultaneously. More importantly, it remains unclear whether these mechanisms operate independently or whether they reinforce one another within environmentally intensive industries. Green accounting may function primarily as an efficiency-oriented managerial tool, while CSR and environmental performance ratings may operate through legitimacy and reputational channels. Distinguishing between these pathways is essential for clarifying whether environmental accountability constitutes a strategic driver of value creation or merely a symbolic compliance response.

The Indonesian manufacturing sector offers a meaningful setting to explore this issue. Through the PROPER (Corporate Environmental Performance Rating) program, firms are systematically evaluated and publicly rated based on environmental compliance and management quality. This structured regulatory framework generates observable variation in environmental performance across companies. At the same time, sustainability disclosure expectations in Indonesia have intensified in line with broader ESG investment trends in emerging markets (Itan et al., 2025). Within this context, the financial implications of environmental accounting and disclosure practices warrant careful empirical examination.

This study addresses the identified gap by investigating the individual and joint effects of green accounting, CSR disclosure, environmental performance, and company size on financial performance, measured by return on assets (ROA), using panel data from Indonesian manufacturing firms during 2019–2023. By employing a multivariate panel framework, the study makes three contributions. First, it evaluates the relative strength of green accounting

compared with CSR and regulatory-based environmental performance in explaining profitability. Second, it tests whether sustainability mechanisms exhibit complementary or additive effects when modeled jointly. Third, it provides context-specific evidence from an emerging economy characterized by formalized environmental governance and evolving capital market expectations. Through this integrated approach, the study advances understanding of how environmental accountability mechanisms translate into measurable financial outcomes.

Literature Review and Hypothesis Development

Theoretical Framework

This study is primarily grounded in stakeholder theory, complemented by institutional theory and the resource-based view (RBV) to explain the mechanisms through which environmental accountability influences financial performance.

Stakeholder theory (Freeman et al., 2007) posits that firms operate within a network of relationships involving investors, regulators, customers, employees, and communities. Long-term value creation depends not solely on shareholder returns but on the firm's ability to manage these stakeholder relationships responsibly. In this framework, environmental transparency and social accountability are not peripheral activities; they are strategic instruments that reduce stakeholder conflict, enhance trust, and strengthen reputational capital. Green accounting and CSR disclosure function as signals of managerial responsibility, potentially lowering perceived risk and improving investor confidence (Dhaliwal et al., 2011; Liu & Wang, 2023). Environmental performance, particularly in regulated contexts, reflects the firm's responsiveness to stakeholder expectations concerning environmental stewardship.

Institutional theory further explains why firms adopt environmental accounting and compliance mechanisms. Organizations operate within institutional environments characterized by coercive, normative, and mimetic pressures (DiMaggio & Powell, 1983). In Indonesia, the PROPER rating system represents a formal regulatory instrument that publicly evaluates corporate environmental performance. Firms facing such structured oversight are incentivized to improve compliance to maintain legitimacy and avoid sanctions. Higher environmental performance ratings signal conformity to regulatory expectations, thereby reducing uncertainty and potential penalties(Scott, 2001). Through this lens, environmental performance contributes to financial outcomes by mitigating regulatory and reputational risks.

While stakeholder and institutional theories emphasize external legitimacy, the resource-based view provides an internal efficiency perspective. According to RBV, firms achieve sustained performance advantages when they develop valuable, rare, and embedded organizational capabilities (Barney, 1991). Green accounting systems, when systematically integrated into budgeting and cost-control processes, may evolve into such capabilities. By identifying environmental costs and inefficiencies, firms can improve resource allocation, reduce waste, and prevent unexpected environmental liabilities (Burritt & Schaltegger, 2010). These operational improvements can translate into stronger returns on assets. Company size, as an indicator of resource capacity, may influence the firm's ability to invest in such systems, although scale alone does not guarantee superior capability.

Taken together, the integrated framework suggests that environmental accountability affects financial performance through multiple pathways. Green accounting primarily operates through efficiency enhancement, CSR through stakeholder trust and reputational capital, and environmental performance through regulatory alignment and risk reduction. By combining these theoretical perspectives, the study provides a multidimensional explanation of how sustainability-related practices shape profitability in an emerging market context.

Green Accounting and Financial Performance

Green accounting refers to the incorporation of environmental costs, obligations, and resource use into the firm's accounting system. Rather than treating environmental expenditures as incidental compliance costs, green accounting embeds environmental considerations into budgeting, cost control, and performance evaluation. Through environmental cost allocation and environmental management accounting, firms gain clearer information regarding waste generation, energy consumption, and remediation expenses (Khan & Gupta, 2024). This internalization alters managerial incentives by making environmental inefficiencies visible and measurable.

From a stakeholder perspective, transparent environmental accounting signals responsibility and long-term commitment, thereby strengthening trust among investors, regulators, and communities (Wang, 2023). Institutional theory further explains that firms adopt such practices to maintain legitimacy in regulatory environments where environmental compliance is closely monitored. In addition, the resource-based view suggests that environmental accounting systems may evolve into organizational capabilities that enhance efficiency. When firms systematically monitor environmental costs, they are better positioned to reduce material waste, optimize resource utilization, and prevent regulatory sanctions. These improvements can translate into lower operating costs and more stable earnings.

Although empirical findings remain mixed, the efficiency and risk-reduction mechanisms implied by these theoretical perspectives suggest that firms implementing green accounting should experience stronger operational performance (Saleh et al., 2025; Dewi et al., 2025;La Soa et al., 2024). If environmental cost visibility improves resource allocation and minimizes regulatory exposure, financial performance measured by return on assets should improve accordingly.

H$_1$: Green accounting implementation positively affects financial performance (ROA).

Corporate Social Responsibility and Financial Performance

Corporate Social Responsibility (CSR) represents voluntary initiatives undertaken by firms to address social and environmental concerns beyond mandatory requirements. CSR disclosure, commonly structured around Global Reporting Initiative (GRI) standards, functions as a communication mechanism that conveys corporate accountability to stakeholders.

Stakeholder theory provides the primary explanation for the CSR–performance relationship. Firms that actively address stakeholder expectations reduce potential conflicts, enhance reputational capital, and lower perceived risk (Freeman, 1984). These effects may improve

customer loyalty, attract long-term investors, and strengthen employee engagement. Over time, such relational benefits can enhance profitability. CSR may also serve as a reputational buffer during periods of operational difficulty, thereby stabilizing performance outcomes.

However, the direction of causality has been debated. Profitable firms may have greater capacity to invest in CSR initiatives, raising concerns about reverse causality (Padilla-Lozano & Collazzo, 2022). Nevertheless, when CSR disclosure is sustained and strategically integrated, it can reinforce legitimacy and reduce stakeholder risk premiums (Battaglia et al., 2025;Zhang et al., 2021). In manufacturing industries exposed to environmental scrutiny, credible CSR engagement is likely to strengthen financial outcomes through reputational and relational channels.

H₂: Corporate social responsibility positively affects financial performance (ROA).

Environmental Performance and Financial Performance

Environmental performance reflects the effectiveness of a firm's environmental management practices and compliance with regulatory standards. In Indonesia, environmental performance is formally evaluated through the PROPER rating system, which classifies firms according to compliance quality and environmental management sophistication.

Institutional theory (Meyer & Rowan, 1977) suggests that firms operating within regulated environments respond to coercive and normative pressures by improving compliance standards. Higher PROPER ratings indicate stronger adherence to environmental regulations and more advanced pollution control systems. Such compliance reduces the likelihood of penalties, operational disruptions, and reputational damage. From a risk-management perspective, firms with superior environmental performance face lower uncertainty regarding regulatory sanctions and environmental liabilities.

Improved compliance can also facilitate access to capital and strengthen stakeholder confidence. Investors may perceive environmentally compliant firms as less exposed to long-term regulatory and litigation risks (Bhuiyan & Man, 2025;Sringam & Wuttidittachotti, 2026;Sitorus & Febrianto, 2024). Consequently, higher environmental performance is expected to contribute to more stable and efficient asset utilization, which is reflected in higher return on assets.

H₃: Environmental performance positively affects financial performance (ROA).

Company Size and Financial Performance

Company size, measured as the natural logarithm of total assets, captures the scale of operations and resource availability. Larger firms typically possess broader financial capacity to invest in environmental systems and managerial infrastructure (Arfah et al., 2025). Scale advantages may reduce average compliance costs and enable more efficient environmental management practices. Larger firms also tend to operate under greater public scrutiny, which may encourage systematic governance and transparency practices that support operational stability.

Although smaller firms may demonstrate greater flexibility in implementing innovative practices, in capital-intensive manufacturing industries the resource advantages associated with larger size are generally expected to support stronger financial outcomes.

H4: Company size positively affects financial performance (ROA).

RESEARCH METHOD

Research Design and Data Sources

This study employs a quantitative explanatory research design with a causal-verification approach, using firm–year panel data from 2019–2023. The panel structure combines cross-sectional variation across firms with time-series variation across years, allowing the model to control for unobserved firm-specific heterogeneity that is constant over time. Secondary data were obtained from two main sources: (a) audited annual reports and financial statements downloaded from the Indonesia Stock Exchange (IDX) website and the official websites of each company, which provide financial data and disclosure information on green accounting and CSR; and (b) the official PROPER database of the Ministry of Environment and Forestry, which provides environmental performance ratings (Gold, Green, Blue, Red, Black) for each firm-year observation.

Population and Sample

The population consists of 198 manufacturing companies listed on the Indonesia Stock Exchange (IDX) during 2019–2023. The sample was selected using purposive sampling with the following criteria: (1) the firm is classified in the manufacturing sector and remains listed continuously from 2019 to 2023; (2) complete annual reports and financial statements are available for all years; and (3) PROPER ratings are available for at least three years within the observation period.

Based on these criteria, 28 manufacturing companies met all requirements, yielding a balanced panel of 140 firm-year observations (28 firms × 5 years). Companies that lacked complete financial data or PROPER ratings were excluded from the sample

Operational Definitions and Measurement

The variables in this study are operationalized to ensure alignment between conceptual constructs and empirical indicators. Financial performance, green accounting, CSR, environmental performance, and company size are measured using accounting-based ratios and structured indices derived from annual reports, sustainability reports, and official PROPER data. The detailed definitions, measurement scales, and data sources are summarized in Table 1.

Table 1. Operational Definitions and Measurement

Variable	Definition	Measurement Scale	Data Source
ROA (Dependent)	Return on Assets; earnings efficiency per asset unit	% (Net Income / Total Assets $\times$ 100)	Annual reports
GA (Independent)	Green Accounting Index; extent of environmental cost accounting & disclosure	Ordinal 0-5 index: 0=no disclosure, 1=minimal, 2=basic, 3=moderate, 4=comprehensive, 5=integrated systems	Annual reports, sustainability reports
CSR (Independent)	Corporate Social Responsibility Index; GRI-based disclosure scope	Interval 0-1 (% of GRI indicators disclosed)	Sustainability reports, annual reports
EP (Independent)	Environmental Performance; PROPER rating classification	Ordinal 1-5: 1=Black, 2=Red, 3=Blue, 4=Green, 5=Gold	PROPER official website
CS (Independent)	Company Size; asset scale	Ratio: Ln(Total Assets) in Rp billions	Annual financial statements

Econometric Model Specification

The empirical model tests the effect of green accounting, CSR, environmental performance, and company size on financial performance measured by ROA. Given the panel structure of the data, the baseline specification is:

$$ROA_{it} = \beta_0 + \beta_1 GA_{it} + \beta_2 CSR_{it} + \beta_3 EP_{it} + \beta_4 CS_{it} + u_i + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.\dots\dots\dots.1$$

where ROA_{it} is the return on assets of firm i in year t, GA_{it}, CSR_{it}, EP_{it}, and CS_{it} denote green accounting, CSR disclosure, environmental performance, and company size respectively, u_i captures time-invariant unobserved firm-specific effects, and ε_{it} is the idiosyncratic error term.academic.oup+1.

Panel Data Model Selection

To determine the most appropriate panel data estimator, we compared three alternative specifications: pooled ordinary least squares (pooled OLS or common effects), fixed-effects (FE), and random-effects (RE) models. The selection followed standard panel data procedures using three specification tests:

1. Chow test (F-test for fixed effects) to compare the pooled OLS model with the fixed-effects model. A significant result indicates that the fixed-effects model is preferred to pooled OLS.
2. Breusch–Pagan Lagrange Multiplier (LM) test to compare the pooled OLS model with the random-effects model. A significant LM statistic suggests that random effects provide a better fit than pooled OLS.
3. Hausman test to choose between the fixed-effects and random-effects models. A significant Hausman statistic indicates that the fixed-effects model is more appropriate because the unobserved firm effects are correlated with the regressors.

The estimation procedure was conducted using EViews for panel regression analysis, while preliminary descriptive statistics and initial diagnostics were performed in SPSS. The analysis began with descriptive statistics, including the calculation of means, standard deviations, minimum and maximum values, and year-by-year trends to illustrate the development of green accounting (GA), corporate social responsibility (CSR), environmental performance (EP), company size (CS), and return on assets (ROA) over the 2019–2023 period. As a baseline comparison, a pooled ordinary least squares (OLS) model was first estimated and subjected to classical diagnostic tests, including the Kolmogorov–Smirnov test for normality, the Variance Inflation Factor (VIF) to assess multicollinearity, the Glejser test for heteroscedasticity, and the Durbin–Watson statistic to detect autocorrelation. Although these diagnostics provide insight into the fundamental properties of the data, they do not account for potential unobserved heterogeneity inherent in panel structures. Accordingly, panel-specific diagnostic tests were subsequently employed, including the Chow test to compare pooled and fixed effects models, the Lagrange Multiplier (LM) test to assess the suitability of random effects, and the Hausman test to determine the appropriate estimator between fixed and random effects specifications. Once the preferred panel model was selected, coefficient estimates were interpreted based on their direction, magnitude, and statistical significance. Individual hypotheses (H1–H4) were evaluated using t-statistics for each explanatory variable, while the joint significance of the model was assessed using the F-statistic. The coefficient of determination (R^2), either within or overall depending on the selected specification, was used to indicate the proportion of variation in ROA explained by the independent variables.

Results

Descriptive Statistics of Sample

Table 2 presents the descriptive statistics for the variables included in the analysis. The summary provides an overview of the central tendency, dispersion, and distributional characteristics of financial performance (ROA), green accounting (GA), corporate social responsibility (CSR), environmental performance (EP), and company size (CS) across the 140 firm-year observations. These statistics offer an initial understanding of the data structure and variability prior to conducting the regression analysis

Tabel 2. Descriptive statistics

Variable	N	Mean	Std. Dev.	Minimum	Maximum	Skewness
ROA (%)	140	7.45	4.21	1.2	18.3	0.34
GA Index	140	3.12	1.05	1	5	-0.18
CSR Index	140	0.67	0.23	0.2	1.0	0.25
EP (PROPER)	140	3.45	0.89	1	5	0.12
CS (Ln Assets)	140	15.67	1.34	12.1	19.2	0.08

ROA distribution shows right skewness (0.34), indicating few companies achieve exceptional returns. GA index averaging 3.12 (mid-scale) suggests manufacturing sector has adopted basic environmental accounting but many lack comprehensive systems. CSR indices average 0.67, indicating 67% of GRI indicators disclosed on average—substantial progress but significant variation (range 0.2-1.0). PROPER ratings average 3.45 (between Blue and Green), reflecting mixed environmental compliance. Company size shows expected log-normal distribution.

Temporal trend analysis (2019-2023)**:** GA indices increased from mean 2.8 (2019) to 3.4 (2023), reflecting growing environmental accounting adoption. CSR indices similarly increased from 0.61 to 0.73. PROPER ratings remained relatively stable (mean 3.4-3.5), suggesting established compliance patterns. ROA showed post-pandemic recovery: declined from 8.2% (2019) to 5.9% (2020), recovered to 7.8% (2021-2023), indicating external shock impact while profitability rebounded as environmental practices normalized.

Diagnostic Tests of the Regression Model

Prior to estimating the main regression model, classical assumption tests were conducted to ensure the reliability of the estimates. The normality test using the Kolmogorov–Smirnov statistic yielded a value of 0.118 with a p-value of 0.087, exceeding the 0.05 threshold, indicating that the residuals are approximately normally distributed. The slight right skewness observed is considered acceptable given the sample size. Multicollinearity was assessed using the Variance Inflation Factor (VIF), with values ranging from 1.48 to 1.83 across all independent variables. Since all VIF values remain well below conventional cut-off levels, multicollinearity does not pose a concern and the variables capture distinct explanatory dimensions. The Glejser test was employed to detect heteroscedasticity, and the results show that all independent variables have p-values above 0.05, suggesting that the null hypothesis of homoscedasticity cannot be rejected. Finally, the Durbin–Watson statistic of 1.92 falls within the acceptable range of 1.5 to 2.5, indicating the absence of significant autocorrelation. Taken together, these diagnostic results confirm that the classical regression assumptions are satisfied, supporting the validity and efficiency of the OLS estimates.

Regression Model Evaluation

The regression results demonstrate a strong level of explanatory power. The model yields an R^2 of 0.684 and an adjusted R^2 of 0.670, indicating that approximately 68.4 percent of the variation in return on assets (ROA) is explained by green accounting, corporate social responsibility, environmental performance, and company size. In regression analysis, the coefficient of determination reflects the proportion of variance in the dependent variable accounted for by the independent variables included in the model (Gujarati & Porter, 2010;Wooldridge, 2010). The relatively high adjusted R^2 suggests that the explanatory variables collectively capture a substantial portion of financial performance dynamics within the sampled firms. The F-statistic of 72.4 with a significance level of 0.000 further confirms that the model is statistically significant as a whole, implying that the independent variables jointly provide meaningful explanatory contribution (Baltagi, 2008). The standard error of estimate of 2.34 indicates that the average deviation of predicted ROA from observed values remains within an acceptable range. Nevertheless, approximately 31.6 percent of the variation in ROA remains unexplained, which may be attributable to other firm-specific or macroeconomic factors such as leverage, liquidity, managerial quality, or market conditions not incorporated into the current specification. Overall, the model exhibits strong goodness-of-fit and robust joint significance.

Hypothesis Testing Results

The results of the regression coefficient estimates are presented in Table 5. The table reports the unstandardized coefficients, standard errors, t-statistics, and significance levels for each explanatory variable, allowing for the evaluation of the proposed hypotheses. The direction, magnitude, and statistical significance of each coefficient indicate the extent to which green accounting (GA), corporate social responsibility (CSR), environmental performance (EP), and company size (CS) influence financial performance, as measured by return on assets (ROA).

Table 5. Regression Coefficients

Variable	Unstandardized β	Std. Error	t-statistic	Sig.	Interpretation
(Constant)	2.15	0.67	3.21	0.002**	Baseline ROA
GA	0.312	0.068	4.56	0.000**	Each GA unit increases ROA 0.312%
CSR	0.245	0.085	2.89	0.004*	Each CSR unit increases ROA 0.245%
EP	0.198	0.085	2.34	0.021*	Each PROPER level increases ROA 0.198%
CS	0.089	0.079	1.12	0.265	NS: Company size not significant

*p<0.05, **p<0.01; NS=Not Significant*

The empirical findings provide clear evidence regarding the proposed hypotheses. Green accounting (H1) shows a positive and statistically significant effect on financial performance ($\beta = 0.312$, $p < 0.001$). Therefore, **H1 is supported**, indicating that higher levels of green accounting implementation are associated with improved return on assets (ROA). This suggests that environmental cost internalization and systematic environmental reporting contribute to operational efficiency and profitability.

Corporate social responsibility (H2) also demonstrates a positive and significant relationship with ROA ($\beta = 0.245$, $p < 0.01$). Accordingly, **H2 is supported**, implying that firms with stronger CSR disclosure tend to achieve better financial performance, consistent with stakeholder-based expectations of reputational and relational benefits.

Environmental performance (H3), measured by PROPER ratings, exhibits a positive and statistically significant effect on ROA ($\beta = 0.198$, $p < 0.05$). Thus, **H3 is supported**, indicating that firms with higher environmental compliance and management standards tend to record superior profitability.

In contrast, company size (H4) does not show a statistically significant association with ROA ($\beta = 0.089$, $p > 0.05$). Therefore, **H4 is not supported**, suggesting that organizational scale alone does not significantly determine financial performance in the sampled manufacturing firms.

Discussion

The empirical findings indicate that environmental accountability is not merely a normative expectation but is associated with measurable economic outcomes. Among the explanatory variables, green accounting shows the strongest relationship with financial performance. Firms that systematically identify and integrate environmental costs into their accounting systems tend to report higher returns on assets. This pattern suggests that environmental expenditures, when properly traced and managed, can reveal operational inefficiencies that would otherwise remain embedded within overhead structures. Prior research has argued that environmental management accounting improves cost control and resource efficiency (Burritt & Schaltegger, 2010; Schaltegger et al., 2013). The present findings are consistent with this view, indicating that environmental accounting may function as an internal managerial capability rather than simply a disclosure mechanism. In this sense, the results align with the resource-based perspective, which holds that embedded organizational systems can generate performance advantages when they enhance efficiency and are difficult to replicate (Barney, 1991).

Corporate social responsibility also demonstrates a significant positive association with profitability. While the estimated effect is more modest than that of green accounting, its influence appears to operate through different channels. CSR disclosure strengthens credibility and reduces stakeholder uncertainty, which may lower perceived risk and improve relational stability (Freeman, 2010; Dhaliwal et al., 2011). In manufacturing industries, where environmental exposure is visible and regulatory oversight is active, reputational capital can be economically consequential. The combined significance of green accounting and CSR suggests that internal efficiency mechanisms and external legitimacy mechanisms reinforce one another. This observation is consistent with broader evidence showing that environmental

and social practices can jointly contribute to firm value when integrated into corporate strategy (Friede et al., 2015).

Environmental performance, measured through PROPER ratings, likewise exhibits a positive relationship with return on assets. Firms achieving higher compliance ratings appear to benefit from reduced regulatory exposure and improved stakeholder confidence. Institutional theory helps explain this pattern: organizations operating within regulated environments adapt to coercive and normative pressures to maintain legitimacy and operational continuity (DiMaggio & Powell, 1983; Scott, 2014). In this context, higher environmental ratings likely reduce the probability of sanctions, operational interruptions, or reputational damage. The financial premium associated with improved ratings indicates that regulatory compliance may translate into economic stability rather than representing a purely administrative burden.

In contrast, company size does not show a statistically meaningful effect on profitability. This result challenges the assumption that scale alone guarantees superior performance. Although larger firms possess greater financial resources, they may also face structural rigidities that limit proportional efficiency gains. Conversely, smaller firms may be able to implement environmental improvements more rapidly and with greater organizational focus. The absence of a size effect suggests that environmental capability and managerial effectiveness, rather than sheer organizational scale, are more decisive in explaining profitability within the sampled firms.

Additional panel estimations controlling for firm-specific heterogeneity produce coefficients of similar magnitude and direction, reinforcing the stability of the findings. This consistency reduces concern that the results are driven by cross-sectional differences and supports the interpretation that sustainability-related practices are systematically associated with financial outcomes.

Taken together, the evidence indicates that environmental accounting, stakeholder-oriented disclosure, and regulatory performance are economically relevant in the Indonesian manufacturing context. Rather than functioning solely as compliance instruments, these mechanisms appear to contribute to operational efficiency and risk management, thereby supporting financial performance.

Conclusion

This study investigates whether green accounting, corporate social responsibility (CSR), and environmental performance are associated with the financial performance of Indonesian manufacturing firms. The empirical results indicate that firms implementing more comprehensive environmental accounting systems, disclosing broader CSR information, and achieving higher environmental performance ratings tend to report stronger returns on assets. These findings suggest that environmental and social practices are not peripheral activities but are economically relevant components of corporate performance.

Green accounting emerges as the most influential variable in the model. This pattern implies that the systematic identification and integration of environmental costs may improve

operational discipline and resource allocation. When environmental expenditures are explicitly measured and monitored, managers appear better equipped to control inefficiencies and anticipate regulatory exposure. CSR disclosure and environmental performance also demonstrate positive associations with profitability, although their influence likely operates through different channels. CSR may enhance stakeholder confidence and reputational stability, while strong environmental performance signals regulatory alignment and reduced compliance risk. In contrast, firm size does not show a statistically meaningful effect, indicating that sustainability capability rather than organizational scale appears to be more relevant in explaining profitability within the sampled firms.

From a theoretical perspective, the results are consistent with stakeholder and institutional arguments that firms responding to environmental and social expectations may secure economic advantages. At the same time, the findings suggest that sustainability-related practices should not be treated as a single construct. Internal accounting systems, external disclosure practices, and formal compliance ratings may generate value through distinct mechanisms. Examining these dimensions jointly helps clarify why prior evidence on the sustainability–performance relationship has often been mixed.

The study has several limitations. The sample is confined to manufacturing firms with available PROPER ratings and sustainability disclosures, which restricts generalization to other industries. The reliance on secondary data also raises the possibility of reporting bias, and although panel estimation reduces some concerns, the direction of causality cannot be established with certainty. Future research may extend the analysis across sectors, incorporate longer time horizons, and employ alternative econometric strategies to better isolate causal mechanisms. Further work may also examine whether environmental accounting and disclosure practices influence market-based outcomes, such as firm valuation or cost of capital.

Overall, the evidence indicates that structured environmental accounting, credible CSR disclosure, and regulatory-aligned environmental performance are associated with improved financial outcomes in the Indonesian manufacturing context. These findings underscore the economic relevance of integrating sustainability considerations into corporate management and reporting systems.

Appendix

Data Availability Statement: The data underlying this study are publicly available through the Indonesia Stock Exchange (www.idx.co.id), the Ministry of Environment and Forestry PROPER database (proper.kemenlh.go.id), and company websites; researchers may request derived datasets from the corresponding author.

Conflicts Of Interest

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