



The Effect of Environmental Performance and Corporate Social Responsibility on Financial Performance with Leverage as a Control Variable

(Evidence from Basic Materials Companies Listed on the Indonesia Stock Exchange)

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Abstract

Although the Basic Materials sector supplies essential raw materials to various industries, its operations may exert substantial adverse environmental impacts, increasing the importance of corporate social responsibility (CSR). Previous studies on the relationships between environmental performance, CSR, and financial performance have produced mixed findings. Using 68 firm-year observations from 17 Basic Materials companies listed on the Indonesia Stock Exchange from 2021 to 2024, this study examines these relationships while controlling for leverage. Financial performance is measured using Return on Assets (ROA), environmental performance using PROPER ratings, CSR using a GRI-based disclosure index, and leverage using the Debt to Asset Ratio (DAR). Panel data regression using a Fixed Effects Model (FEM) was employed, as indicated by the Chow and Hausman tests. The model is statistically significant overall ($F = 5.702$, $p < 0.001$; adjusted $R^2 = 0.571$). Environmental performance is not significantly associated with financial performance ($\beta = -0.0096$, $p = 0.5305$), whereas CSR ($\beta = -0.0970$, $p = 0.0283$) and leverage ($\beta = -0.7592$, $p = 0.0004$) are significantly and negatively associated with financial performance. These findings indicate that neither CSR disclosure nor environmental performance is positively associated with contemporaneous profitability in this sample. One possible interpretation is that sustainability-related expenditures may place pressure on current earnings, while their potential benefits may emerge over a longer horizon. However, this study examines contemporaneous associations, does not test lagged effects, and does not directly measure CSR-related costs or future benefits; therefore, this explanation remains speculative and requires further investigation. Companies may nonetheless consider integrating sustainability strategies into their core business models, while future studies could employ lagged specifications and direct cost measures to assess whether sustainability-related investments translate into long-term competitive advantages.

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INTRODUCTION

The Basic Materials sector plays a strategic role in the national economy as a key supplier of raw materials for various industries. However, its operations rely heavily on intensive natural resource exploitation, resulting in significant emissions, industrial waste, and energy consumption (Indonesia Stock Exchange, 2025). This tension between economic contribution and environmental

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impact is closely related to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation, and Infrastructure), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action). These goals are relevant to this study because they emphasize the importance of integrating sustainable practices into the operational strategies of industrial companies. In this context, environmental performance reflects companies' efforts to manage their environmental impacts, whereas CSR disclosure indicates how effectively companies communicate their social and environmental responsibilities to stakeholders. Examining the relationship between these sustainability practices and financial performance may therefore provide insight into whether sustainability initiatives are associated with corporate economic outcomes (Badan Pusat Statistik, 2025).

From a practical perspective, the financial performance of companies in this sector has fluctuated in a manner that appears to be disconnected from asset growth. Total assets in the sector increased sharply by approximately 20.62% in 2023, reflecting continued expansion and fixed-asset investment despite prevailing market pressures. However, this asset growth was not fully accompanied by improvements in profitability. Based on sector-level calculations, the average Return on Assets (ROA) of Basic Materials companies declined from 3.55% in 2022 to 2.18% in 2023 before slightly recovering to 2.47% in 2024. This pattern indicates that increased asset accumulation during the period was not consistently accompanied by improved efficiency in generating profits from available resources. The decline was exemplified by the performance of PT Timah Tbk (TINS), whose net profit dropped by 98.5% to only IDR 16.26 billion, driven by declining global tin prices amid weak demand and rising tin inventories on the London Metal Exchange (LME) (CNBC Indonesia, 2023). The pressure was not limited to a single firm. The average ROA of the Metals & Minerals subsector declined from 3.70% in 2022 to only 1.50% in 2023, indicating that weakening commodity prices reduced profitability across the subsector even as production volumes, and consequently asset bases, remained relatively high. This pattern suggests that companies' asset bases continued to grow while profitability declined or fluctuated, indicating that additional assets were not fully converted into earnings and that asset-use efficiency, as reflected in ROA, weakened.

Possible explanations, such as debt-financed expansion, inventory accumulation, or declining commodity prices, may have contributed to this pattern, although these factors are not directly examined in this study. This divergence between asset growth and profitability becomes particularly relevant given that, over the same period, CSR disclosure increased consistently from 0.3224 in 2021 to 0.6759 in 2024, while environmental performance, as reflected in PROPER ratings, was predominantly concentrated in the Blue and Green categories. Of the 17 sampled companies, 8 companies (47.06%) received a Blue rating and 5 companies (29.41%) received a Green rating, representing 76.47% of the sample in total. This indicates that most companies either complied with the applicable environmental management requirements (Blue) or demonstrated performance beyond the required compliance level (Green), consistent with the PROPER assessment framework (Ministry of Environment and Forestry, 2025). This study is grounded in Legitimacy Theory, which proposes that organizations seek to align their activities with prevailing social norms, values, and expectations in order to obtain and maintain social legitimacy (Suchman, 1995). In the sustainability context, environmental performance and CSR disclosure can serve as mechanisms through which companies demonstrate that their operations are aligned with societal expectations. According to Cahyani & Mayangsari (2022), environmental performance and CSR disclosure may also strengthen stakeholder confidence by demonstrating a company's commitment to social and environmental responsibility.

Good environmental performance signals compliance with environmental requirements, while CSR disclosure communicates a company's social and environmental responsibilities to external stakeholders. These practices may strengthen corporate reputation, reduce information asymmetry, and enhance stakeholders' perceptions of the company, which may ultimately contribute to improved financial performance. The relationships among financial performance, CSR disclosure, and environmental performance in Indonesian companies have also been examined empirically (Pramudiati et al., 2022; Wardhaningrum et al., 2022).

However, previous studies provide conflicting evidence regarding whether legitimacy-seeking behavior translates into financial benefits. Some studies have reported a positive relationship between environmental performance and financial performance (Liu et al, 2020; Tjandrakirana,

2024), whereas others have reported no significant relationship among KOMPAS100 companies or PROPER participants (Gayatri et al., 2024; Bellamy et al., 2023). Similarly, Yendrawati and Kinanti (2024) found no significant effect of CSR on financial performance and suggested that CSR may be perceived as a short-term cost burden rather than a value-generating activity. In contrast, Tarigan et al., (2025) and Najihah et al. (2021) reported positive and significant relationships, which they associated with stronger stakeholder trust and competitiveness.

These inconsistent findings indicate that the relationship between sustainability performance and financial performance remains inconclusive. More specifically, previous studies differ in the indicators used to measure sustainability performance, the observation periods examined, the industries investigated, and the resulting empirical findings. For example, Aldo et al. (2025) examined financial performance, CSR, and environmental performance among Basic Materials companies during 2021–2023 and found that CSR significantly improved ROA, whereas environmental performance had no significant effect on financial performance. Similarly, Nisa and Wilasittha (2026) examined the relationship between environmental performance and financial performance in Basic Materials companies during 2021–2024 and found that capital structure had a significant negative effect on financial performance, whereas environmental performance had no significant effect. These findings indicate the need for further empirical evidence from Basic Materials companies during 2021–2024 regarding the relationships among PROPER-based environmental performance, CSR disclosure, and financial performance, particularly when leverage is controlled. Accordingly, this study aims to examine the relationships among environmental performance, CSR, and financial performance in Basic Materials companies listed on the Indonesia Stock Exchange from 2021 to 2024, with leverage included as a control variable (Mardaningsih et al., 2021).

Although recent studies have examined sustainability-related factors in the Indonesian Basic Materials sector, differences remain in the variables investigated, measurement approaches, research periods, and model specifications. For example, Aldo et al. (2025) examined environmental performance, CSR, and financial performance in Basic Materials companies during 2021–2023, whereas Nisa and Wilasittha (2026) examined environmental performance and capital structure during 2021–2024. Therefore, the simultaneous examination of PROPER-based environmental performance, GRI-based CSR disclosure, financial performance measured by ROA, and leverage as a control variable provides a relevant context for further investigation. The Basic Materials sector is particularly suitable for examining these relationships because of its intensive use of natural resources and its relatively high exposure to environmental risks. This study also addresses a methodological gap by incorporating leverage as a control variable. Previous studies, such as Bellamy et al. (2023) and Gayatri et al. (2024), , focused primarily on environmental performance. By incorporating leverage, the present study attempts to distinguish the association of sustainability-related variables with financial performance from the influence of capital structure.

In addition, the 2021–2024 observation period captures a distinctive post-pandemic phase in which commodity prices rebounded rapidly from pandemic lows before broadly declining from 2022 onward (World Bank, 2024). This phase has been described as a new post-pandemic commodity cycle and is consistent with the decline in ROA observed in TINS and the Metals & Minerals subsector discussed above (World Bank, 2025). Recent global evidence suggests that the relationship between ESG and financial performance strengthened during the post-pandemic period, particularly in environmentally sensitive sectors such as mining (El Mawla et al., 2026). Similarly, ESG performance has been found to improve the financial performance of polluting companies in the post-COVID-19 period (Pasupuleti et al., 2024). In Indonesia, however, the PT Timah case, in which relatively strong ESG ratings coincided with severe environmental damage, suggests that the effectiveness of ESG-related practices in the mining sector remains questionable (Retnosari & Frimasika, 2025). This study therefore examines whether relationships reported in previous samples remain evident when profitability is strongly influenced by commodity cycles (Wulandari et al., 2026).

Theoretically, this study moves beyond the simple application of Legitimacy Theory, which proposes that firms seek congruence between their activities and prevailing social values in order to maintain their continued existence (Dowling & Pfeffer, 1975). Recent research extends this perspective by interpreting environmental and CSR disclosure as responses to institutional and societal pressures (Leggerini et al., 2026). Although this perspective helps explain why firms disclose

sustainability-related information, the literature has not reached a consensus regarding whether, and under what conditions, such activities translate into financial returns (El Mawla et al., 2026). This study addresses this gap by considering external economic pressure, reflected in post-pandemic commodity volatility, as a relevant contextual condition, given evidence that economic uncertainty influences how firms engage in sustainability-related disclosure (Danisman et al., 2025). It also distinguishes between symbolic legitimacy, which signals conformity without necessarily producing substantive outcomes, and substantive legitimacy, which is associated with tangible environmental and financial outcomes (Khan, 2025). This distinction is particularly relevant in the Indonesian mining context, where strong ESG ratings have sometimes coexisted with severe environmental damage (Retnosari & Frimasika, 2025). Accordingly, this study seeks to refine the application of Legitimacy Theory by examining the conditions under which legitimacy-related activities may be associated with financial value, particularly from the perspective of pragmatic legitimacy, which is grounded in stakeholders' self-interested evaluations (Suchman, 1995). Practically, the findings are expected to provide insights for corporate management in designing sustainability strategies that balance legitimacy-building with financial sustainability, for regulators particularly the Ministry of Environment and Forestry of Indonesia (KLHK) in evaluating the effectiveness of the PROPER program (Al Ayyubi & Murti, 2024), and for investors in assessing whether sustainability disclosures are meaningfully associated with financial performance in resource-intensive sectors.

LITERATURE REVIEW

Legitimacy Theory

According to Legitimacy Theory, organizations continuously seek to align their activities with societal expectations in order to maintain legitimacy and ensure their continued operation (Suchman, 1995). Legitimacy can be regarded as a strategic organizational resource because its absence may jeopardize an organization's long-term survival, regardless of its financial performance, as stakeholders may withdraw the social and economic support on which the organization depends (Suchman, 1995).

The relevance of Legitimacy Theory to this study lies in its ability to explain how legitimacy can be established through observable corporate actions and disclosures and how these actions may have economic consequences, rather than merely assuming that firms seek social acceptance (Dowling & Pfeffer, 1975). Dowling and Pfeffer (1975) explain that organizational actions and disclosures can communicate conformity with societal expectations, particularly when external stakeholders cannot directly observe or verify the consequences of corporate activities. In resource-intensive industries such as the Basic Materials sector, this function is particularly relevant because stakeholders may face difficulties in directly observing the environmental impacts of corporate operations. Consequently, companies may rely on observable indicators, such as environmental performance ratings and CSR disclosure, to demonstrate that their business practices align with ethical standards and environmental responsibilities.

This function is particularly relevant to companies in Indonesia's Basic Materials sector, which are involved in the extraction, processing, and disposal of natural resources and are therefore exposed to considerable environmental risks. The PROPER rating provides an externally assessed indication of how companies manage their environmental responsibilities, including regulatory compliance and, for higher ratings, environmental practices that exceed minimum requirements (Ministry of Environment and Forestry, 2021). CSR disclosure complements this environmental assessment by communicating information about companies' social and environmental responsibilities to external stakeholders. Therefore, both PROPER performance and CSR disclosure can be regarded as observable legitimacy signals through which companies demonstrate their alignment with broader societal expectations (Cahyani & Mayangsari, 2022).

Based on Legitimacy Theory, this study proposes two mechanisms to explain how environmental performance and CSR disclosure may be associated with financial performance. First, the institutional compliance mechanism refers to the role of environmental performance in demonstrating that firms comply with applicable environmental requirements and maintain social legitimacy. The PROPER assessment explicitly distinguishes between compliance and beyond-compliance criteria, making the rating an observable indicator of a firm's environmental management practices (Ministry of Environment and Forestry, 2021). Higher environmental

performance may therefore help firms reduce the risks of regulatory problems, reputational damage, and disruptions to stakeholder relationships, thereby supporting the continuity of business operations. This mechanism is consistent with Legitimacy Theory rather than being a mechanism specifically introduced by [Dowling and Pfeffer \(1975\)](#).

Second, the disclosure mechanism concerns the role of CSR information in communicating a firm's social and environmental responsibility to external stakeholders. Companies in Indonesia are not necessarily required to disclose information fully in accordance with the GRI Standards, although sustainability reporting is subject to regulatory requirements. Organizations may use the GRI Standards as a framework for reporting their social, environmental, and economic impacts and for responding to stakeholder information needs ([Fuadah et al., 2022](#); [Global Reporting Initiative, 2021](#)). Empirical evidence from Indonesia indicates that CSR disclosure is intended to provide stakeholders with information regarding corporate responsibility and may contribute to stakeholder trust, although its effects on financial performance remain inconsistent ([Hidayah et al., 2021](#)). Thus, in this study, CSR disclosure is viewed as a communication mechanism through which firms demonstrate accountability, transparency, and responsiveness to stakeholder expectations.

However, Legitimacy Theory does not imply that higher environmental performance or greater CSR disclosure will automatically improve financial performance within the same fiscal period. Environmental management and CSR activities may require financial resources before their potential benefits are realized. The positive relationships proposed in H1 and H2 are therefore expected under conditions in which the legitimacy-related benefits generated by these activities such as stronger stakeholder confidence, improved reputation, reduced environmental or social risk, and greater continuity of business relationships are sufficient to offset or exceed their associated costs. Previous empirical research on Indonesian companies provides evidence of positive relationships between environmental performance or sustainability-related disclosure and financial outcomes, although the magnitude and significance of these relationships vary across settings ([Firmanda & Wahyuni, 2024](#); [Hanjani et al., 2023](#)). Accordingly, both H1 and H2 propose positive relationships, while acknowledging that these benefits may depend on the credibility of environmental performance and reporting, stakeholder perceptions, and the time required for sustainability investments to generate financial returns.

Effect Environmental Performance on Financial Performance

Empirical evidence regarding the relationship between environmental performance and financial performance varies across market and industry contexts ([Gayatri et al., 2024](#); [Liu et al., 2020](#)). Studies conducted in settings characterized by stronger regulatory enforcement or greater public scrutiny often report positive relationships. For example, ([Liu et al., 2020](#)), using Bloomberg ESG data from 461 prominent U.S. corporations, demonstrated a significant bidirectional relationship between environmental and financial performance, suggesting that the two may reinforce one another over time in capital markets with relatively well-developed ESG reporting practices. Similarly, [Tjandrakirana \(2024\)](#) found that environmental performance had a positive effect on the financial performance of healthcare organizations in Indonesia.

In contrast, studies using compliance-based measures such as the PROPER environmental rating have reported insignificant relationships ([Bellamy et al. 2023](#); [Gayatri et al. 2024](#)). These findings suggest that compliance-based environmental performance may not necessarily translate into immediate financial benefits, particularly when environmental ratings primarily reflect regulatory compliance rather than strong market differentiation. However, this evidence remains context-dependent and should not be interpreted as a uniform pattern across the literature. The present study re-examines this relationship during 2021–2024, a period in which the PROPER program expanded substantially and environmental disclosure received increasing regulatory and stakeholder attention. PROPER participation increased from 2,593 companies in 2020–2021 to 4,495 companies in 2023–2024, while the assessment process continued under Minister of Environment and Forestry Regulation No. 1 of 2021 and the SIMPEL reporting system. The involvement of an independent PROPER Advisory Board further strengthened the credibility of the assessment process ([Ministry of Environment and Forestry, 2021](#)). Under these conditions, environmental performance may function as a more visible legitimacy signal, providing a basis for re-examining its relationship with financial performance.

Based on Legitimacy Theory, firms are expected to align their operations with societal expectations and environmental norms in order to maintain legitimacy (Dowling & Pfeffer, 1975). A higher PROPER rating indicates stronger environmental management and may reduce regulatory risks and operational disruptions. Furthermore, publicly disclosed PROPER ratings may enhance corporate legitimacy among stakeholders, potentially improving operational continuity and access to capital (El Mawla et al., 2026; Suchman, 1995). Such benefits are more likely to emerge when environmental practices generate substantive outcomes rather than merely symbolic compliance (Khan, 2025).

Previous research therefore provides a theoretical and empirical basis for expecting a positive relationship between environmental performance and financial performance. Accordingly, the following hypothesis is proposed:

H₁: Environmental performance positively affects Financial Performance.

Effect Corporate Social Responsibility (CSR) on Financial Performance

Empirical findings on the relationship between Corporate Social Responsibility (CSR) and financial performance exhibit a similar pattern of divergence, although the variation appears to be driven primarily by the cost intensity and time horizon of CSR activities rather than by industrial differences alone (Tarigan et al., 2025; Yendrawati & Kinanti, 2024). Positive relationships have been reported in studies that conceptualize CSR as a mechanism associated with stakeholder trust and market positioning. For instance, Tarigan et al. (2025) found that CSR positively influences financial performance and market share while reducing idiosyncratic risk among Indonesian consumer goods companies. Similar to how this study used the Global Reporting Initiative (GRI)-based CSRI to measure CSR, Najihah et al. (2021) found that CSR disclosure had a positive and significant impact on ROA, ROE, and ROS in Indonesian manufacturing firms. These findings indicate that CSR practices, particularly when reflected through transparent disclosure and stakeholder-oriented activities, may contribute to improved financial outcomes.

Conversely, insignificant or mixed findings have also been reported in studies examining CSR and financial performance, particularly when CSR is associated with direct resource allocation rather than reputational benefits (Brahmana & Kontesa, 2021; Yendrawati & Kinanti, 2024). Yendrawati and Kinanti (2024) found that CSR has no significant effect on the financial performance of Indonesian manufacturing companies, arguing that CSR activities may still be perceived as cost burdens whose economic benefits cannot be realized in the short term. Similarly, Brahmana and Kontesa (2021) reported that although CSR disclosure positively affects financial performance, environmental expenditures have a negative effect. This distinction suggests that CSR disclosure and environmental expenditure represent different dimensions of corporate responsibility: CSR disclosure reflects the communication of social and environmental commitments to stakeholders, whereas environmental expenditure represents actual financial resources allocated to environmental activities. Therefore, differences in CSR measurement and implementation may explain the variation in empirical findings regarding the CSR–financial performance relationship.

Taken together, these findings indicate that CSR disclosure can enhance financial performance when it functions as a mechanism for building stakeholder trust and market positioning rather than being treated merely as a compliance cost. Tarigan et al. (2025) demonstrated that CSR positively influences both financial performance and market share while reducing idiosyncratic risk among Indonesian companies and Najihah et al. (2021), using the same GRI-based CSR Index adopted in this study, similarly found a positive and significant effect of CSR disclosure on ROA, ROE, and ROS among Indonesian manufacturing firms. Even within the disclosure-based literature, findings diverge. Yendrawati and Kinanti (2024) found that CSR disclosure had no significant effect on the financial performance of 37 Indonesian manufacturing firms over 2019–2021. In contrast, Tsatsaronis et al. (2022) constructed a disclosure-based index of 17 ISO 26000 components through content analysis of corporate and CSR reports for 50 listed shipping companies over 2010–2019. Using the Fama-French three-factor, Carhart four-factor, and Fama-French five-factor models, they found that companies with high CSR had greater anomalous returns. The index was also positively correlated with ROA and, to a lesser extent, ROE. These divergent results may reflect differences in industry context, sample size, observation period and outcome measures (accounting-based versus market-based performance). Notably, both studies capture the extent of CSR disclosure rather than its quality

or the resources firms actually commit to CSR activities. Since the present study measures CSR using a comprehensive GRI-based disclosure index that signals transparency and accountability to stakeholders, consistent with the voluntary disclosure mechanism proposed by Legitimacy Theory, higher CSR disclosure is expected to strengthen stakeholder confidence and, consequently, financial performance.

H₂: Corporate Social Responsibility positively affect Financial Performance.

In light of the foregoing discussion, the underlying analytical configuration of this research is visually mapped in Figure 1.

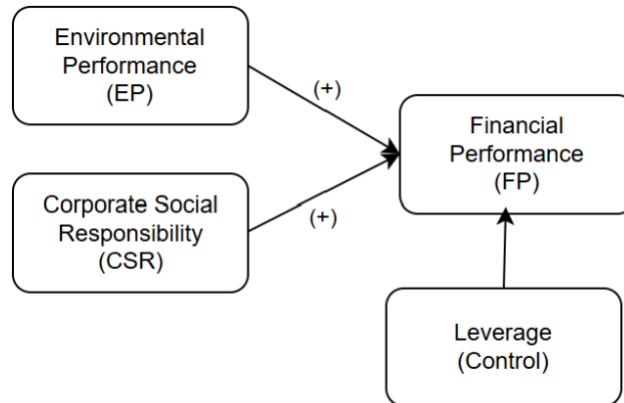


Figure 1. Conceptual Framework

METHOD

The quantitative methodology of this study is based on secondary panel data culled from the 2021–2024 annual reports and sustainability reports of Basic Materials firms traded on the IDX. There were 109 Basic Materials firms that were part of the population and were listed on the IDX in 2024. Purposive sampling was used to determine the sample, with four consecutive exclusion criteria applied. To begin, 76 firms remained after 33 were removed for inconsistencies in their IDX listings 2021 - 2024. Secondly, 59 firms remained after 17 were removed because they did not regularly provide annual reports and sustainability reports during the year. Third, 25 companies were excluded for not consistently participating in or disclosing the PROPER environmental rating program, leaving 34 companies. Fourth, 17 companies were excluded because they did not disclose CSR information based on the GRI Standards during the observation period. After applying all selection criteria, including consistent listing status, availability of annual reports and sustainability reports, PROPER participation, and GRI-based CSR disclosure, Seventeen businesses made up the final sample. A total of 68 firm-year observations were derived from the study's four-year observation period, which ran 2021 - 2024.

According to [Gayatri et al. \(2024\)](#), Return on Assets (ROA) is a metric used to quantify financial performance, which is the dependent variable. A PROPER rating, as provided by the Minister of Environment and Forestry of the Republic of Indonesia under Regulation No. 1 of 2021, is used to quantify environmental performance. The five rating categories are transformed into an ordinal scale according to previous research ([Cahyaningsih & Septyaweni, 2022](#); [Majidah & Aryanty, 2022](#)): Black = 1, Red = 2, Blue = 3, Green = 4, and Gold = 5. The scoring system does not intend to represent exact equal distances between PROPER categories but rather reflects the hierarchical order of environmental performance levels, where higher scores indicate better environmental performance. Therefore, the interpretation of the coefficient focuses on the direction of the relationship between environmental performance and financial performance rather than assuming an exact numerical difference between categories. Furthermore, to address the potential limitation arising from treating ordinal categories as numerical values, a robustness test using dummy variables for each PROPER category will be conducted. The results will be compared with the main model to examine whether the findings remain consistent when the ordinal assumption is relaxed.

[Anam and Utami \(2022\)](#) state that the GRI Standards 2021 issued by the GSSB cover the GRI 300 (environmental), GRI 400 (social), and GRI 102 (governance) indicators, which form the basis of

a disclosure index used to quantify corporate social responsibility. The Debt to Asset Ratio (DAR) is used to quantify leverage, which is the control variable (Wardhani P et al., 2021). One hundred and seventeen disclosure elements culled from relevant GRI Standards indicators make up the CSR disclosure index. During the observation period of 2021–2024, enterprises in the Basic Materials industry were required to disclose certain information in their sustainability reports about environmental, social, and governance elements. This information was used to establish the total number of items. The coding procedure was conducted using a content analysis approach. Each sustainability report was examined manually based on the predetermined GRI item checklist. A score of 1 was assigned when a company disclosed information corresponding to a specific GRI item, while a score of 0 was assigned when the company did not disclose the required information.

In EVIEWS 13, we approximated panel data regression. To find the best panel data regression model, this study used the Chow and Hausman tests for model selection. The Common Effect Model (CEM) and the Fixed Effect Model (FEM) were compared using the Chow Test, and the relative merits of FEM and the Random Effect Model (REM) were ascertained using the Hausman Test. There was no longer any need to conduct the Lagrange Multiplier (LM) Test to compare CEM and REM after the Chow and Hausman tests established that FEM was the better model. Following these steps, the Fixed Effect Model (FEM) was chosen as the ultimate model for estimate. According to Baltagi (2021) and Wooldridge (2025), the slope coefficients of the Fixed Effect Model (FEM) estimated using the Least Squares Dummy Variable (LSDV) method are the same as those of the inside (fixed-effects) estimator. This method incorporates firm-specific intercepts. We investigate the diagnostic requirements for valid inference with the FEM in mind as it is an OLS-based estimator (Ghozali, 2021). The Variance Inflation Factor (VIF) is a measure of multicollinearity; VIF values below 10 indicate the absence of significant multicollinearity (Ghozali, 2021). Since the standard Durbin-Watson statistic is not appropriate for panel data, we use the modified Wald test for groupwise heteroskedasticity to check for heteroskedasticity and the Wooldridge test for autocorrelation in panel data to check for serial correlation (Baltagi, 2021). Normality of residuals is examined using the Jarque–Bera test; although normality is not required for the consistency of the estimator, it is relevant for small-sample inference given our 68 observations (Wooldridge, 2025).

The GLS estimation used in the REM corrects only for the error structure induced by the random firm effect and does not, by itself, account for arbitrary heteroskedasticity or serial correlation (Baltagi, 2021). Therefore, robust inference remains necessary when these problems are present. In this study, we report standard errors clustered at the firm level, which are robust to both heteroskedasticity and within-firm serial correlation (Abadie et al., 2023; Wooldridge, 2025). Hypotheses were then tested using the t-test, F-test, and coefficient of determination (R^2). To ensure consistency in measurement and analysis, each research variable was operationalized using established indicators and measurement proxies adopted from previous studies. The operationalization of variables is presented in Table 1.

Table 1. Operational Variables

Variable	Indicator	Source
Financial Performance	$ROA = \frac{\text{Net income}}{\text{Total Asset}}$ Numerator: Net income after tax reported by the company. Denominator: Completion of the reporting period's total assets. ROA is a measure of a company's profitability.	(Wardoyo et al., 2022)
Environmental Performance	PROPER color rating 5 = Gold 4 = Green 3 = Blue 2 = Red 1 = Black The Indonesian Ministry of Environment and Forestry uses the PROPER grade as a yardstick for environmental performance. The categorical	(Rajak, 2022)

	rating is transformed into an ordinal numerical score, where a higher score indicates better environmental performance.	
Corporate Social Responsibility (CSR)	$CorporateSocialResponsibilityIndex = \frac{\sum X_{ij}}{nj}$ Numerator ($\sum X_{ij}$): Total number of GRI disclosure items reported by company j. Each item is coded: 1 = disclosed, 0 = not disclosed. Denominator (n_j): Total applicable disclosure items based on GRI Standards 2021 (117 items). The index represents the proportion of disclosed CSR items.	(Benali, 2025)
Leverage	$DAR = \frac{Total\ Debt}{Total\ Assets}$ Numerator: Total liabilities/debt reported by the company. Denominator: Total assets owned by the company. DAR indicates the proportion of company assets financed through debt.	(Kalash, 2023)

A number of methodical steps were taken throughout the research approach to guarantee a well-organised and trustworthy study. Initially, study issues about the contradictory correlation between Basic Materials businesses' financial success, CSR, and environmental performance were identified. Subsequently, a literature review was conducted to develop the theoretical foundation, particularly Legitimacy Theory, and to identify research gaps from previous studies (Sekaran & Bougie, 2019). Based on the literature review, hypotheses were formulated, research variables were determined, and the research methodology was established, including variable measurement, data sources, sampling criteria, and analytical techniques.

Finally, the research findings were interpreted and discussed by comparing the results with previous studies and theoretical perspectives. Conclusions and recommendations were subsequently formulated based on the empirical findings. The overall research procedure is presented in Figure 2.

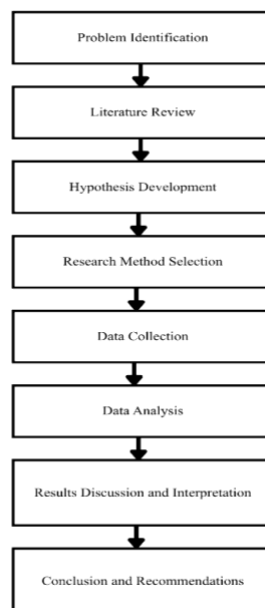


Figure 2. Research Data Collection and Analysis Procedure

Data Collection Technique

Companies listed on the IDX in the Basic Materials sector 2021 - 2024 had their annual reports and sustainability reports used as archival evidence in this study. The data was gathered using a documentation method from open sources, such as the IDX database and the official websites

of each organization that was sampled. The theoretical framework and hypothesis formulation were further strengthened by conducting a literature survey of pertinent academic publications, books, journals, and prior empirical investigations. All of the study variables were used to classify the data sources. The financial performance metrics of ROA and leverage (DAR) were culled from firms' official websites and yearly reports that were made public through IDX. The CSR disclosure data was culled from sustainability reports and annual reports using the GRI-based CSRI, while environmental performance data was sourced from the PROPER ratings published by the Ministry of Environment and Forestry (KLHK).

Data Analysis Techniques

Statistical analysis in this work followed a strict protocol that included first doing descriptive analyses, then selecting a panel data model, checking classical assumptions, estimating panel data regression, and finally testing hypotheses. To begin, we utilised descriptive statistics, which include measures like median, mean, and standard deviation, to characterise the study data and its distribution. Next, we used the Chow, Hausman, and LM tests to identify the best panel data regression model. If the probability value is less than 5%, then the FEM is the better choice over the CEM, which is why the Chow test was used to choose between the two. When choosing between FEM and the REM, the Hausman test was utilised; a probability value below 5% signifies that FEM should be selected. On the other hand, a probability score below 5% suggests that REM is more suited than CEM when comparing the two using the LM test.

Classical assumption tests were executed to guarantee the regression model's dependability once the best suitable panel data model was chosen. Afterward, hypothesis tested to see if the associations between the study variables were significant, and then we estimated the panel data regression model that we had chosen. The purpose of these tests is to identify the optimal panel data regression method by comparing different model specifications. In general, EViews version 13 is used to do the analysis.

What follows is the presentation of the panel data regression model used to analyse the correlation between environmental performance, CSR, leverage, and financial performance:

$$ROA = \alpha + \beta_1 EP + \beta_2 CSR + \beta_3 LV + \varepsilon$$

Choose a significance threshold of 5% to test our hypotheses. The F-test, which looks at how all the independent variables affect financial performance at once, the R-squared value, which measures how well the regression model explains financial performance, and the t-test, which looks at how each independent variable affects financial performance separately, are all part of the testing procedures.

RESULTS AND DISCUSSION

Descriptive Statistics Analysis

In order to characterise the features and distribution patterns of the study's variables, descriptive statistics are employed. Financial performance (ROA), environmental performance (PROPER), CSR, and leverage (DAR) are all descriptively analysed in Table 2. The analysis takes into account the minimum, maximum, mean, and standard deviation values, which are derived from 68 firm-year data collected from 17 Basic Materials businesses listed on the IDX 2021 - 2024.

Table 2. Descriptive Statistics

Statistik	FP	EP	CSR	LV
Mean	0.221913	3,573529	0.568738	0.380850
Median	0.201862	3,000000	0.564100	0.402619
Maximum	0.395601	5,000000	1,000000	0.684590
Minimum	0.059161	1,000000	0.059800	0.111534
Std. Dev.	0.085735	0.834269	0.258887	0.162742
Observation	68	68	68	68

Based on Table 2, descriptive statistics provide an overview of the characteristics of the research data, including the mean, maximum value, minimum value, and standard deviation of each variable. The financial performance variable (ROA) has a mean value of 0.221913, which is equivalent to 22.19% when expressed as a percentage. This value represents the average ROA of the 68 firm-year observations included in the research sample. The maximum value of 0.395601 39.56% indicates the highest profitability level among the sampled observations, while the minimum value of 0.059161 5.92% represents the lowest profitability level. The standard deviation of 0.085735 indicates that variations in financial performance among sampled firms were relatively moderate. This value indicates that several companies in the sample achieved relatively high profitability levels, contributing to the overall average. The maximum value of 0.395601 indicates that some companies were able to generate higher returns compared to other firms, while the minimum value of 0.059161 reflects the existence of companies with lower profitability in utilizing their available resources. The standard deviation of 0.085735 is lower than the mean value, indicating that differences in financial performance among companies were not highly dispersed. This suggests that most companies in the sample had relatively similar profitability levels. The difference between the ROA values reported in the Introduction and Table 2 is due to differences in the calculation basis. The ROA figures presented in the Introduction represent sector-level aggregate calculations, whereas the descriptive statistics in Table 2 are calculated based on the selected sample of 17 companies and 68 firm-year observations. Therefore, the two figures reflect different aggregation approaches and should not be interpreted as directly comparable.

The environmental performance variable (PROPER) has a mean value of 3.573529. Since PROPER ratings are ordinal, this mean does not represent a specific category. Based on the frequency distribution, the Blue category was dominant, with 8 companies (47.06%), followed by Green with 5 companies (29.41%), indicating that 76.47% of the sample was concentrated in these two categories. The maximum value of 5.000000 indicates that certain companies achieved the highest PROPER rating through superior environmental management practices. In contrast, the minimum value of 1.000000 shows that some companies received the lowest environmental performance rating during the observation period. Differences in environmental management practices were not too extreme, as indicated by the modest variance in environmental performance among enterprises (standard deviation of 0.834269).

The Corporate Social Responsibility (CSR) variable has a mean value of 0.568738, indicating that companies disclosed more than half of the CSR indicators used in this study on average. This finding reflects increasing corporate attention to social and environmental responsibility, consistent with stakeholder demand for greater transparency regarding non-financial information (Cahyani & Mayangsari, 2022; Hidayah et al., 2021). A number of 1.000000 indicates that all CSR indicators examined in this study were revealed by some firms, while a value of 0.059800 indicates that some companies still disclosed very little. Variations in CSR disclosure policies among organisations are indicated by the standard deviation of 0.258887; nonetheless, these disparities are still within a tolerable range.

With a mean value of 0.380850, the leverage variable (DAR) serves as a control variable. This finding suggests that stock financing accounted for the majority of the company's assets, while debt financing accounted for around 38%. Based on the selected firms' modest finance structures and lack of reliance on external investment, this amount of leverage is indicative of that. Companies that depended less on debt financing had a minimum value of 0.111534, while those that relied more heavily on debt had a maximum value of 0.684590. Companies' leverage levels varied somewhat, with a standard deviation of 0.162742, indicating that capital structure variances were not very extreme. Using panel data regression, can further analyse the effects of environmental performance, CSR, and leverage on financial performance. The descriptive statistics show that the research variables show enough variation across the 68 firm-year observations.

Panel Data Regression

This study's best fit for the estimating process is the Fixed Effect Model (FEM), according to the model selection approach for panel data regression (Basuki, 2021). Thus, in order to investigate the impact of environmental performance, CSR, and leverage on financial performance, a regression analysis was carried out utilising the FEM technique. A number of specification tests were carried

out in order to pick the most suitable panel data regression model. One of the first steps in doing the study was to run the Chow test to see if the FEM or the CEM fitted better. Table 3 displays the outcomes of the Chow test.

Table 3. Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.729817	-16,48	0.0002
Cross-section Chi-square	54.939625	16	0.0000

The Chow test results in Table 3 show probability values of 0.0002 and 0.0000 for the Cross-section Chi-square. The null hypothesis (H_0) states that the CEM is appropriate, while the alternative hypothesis (H_1) supports the FEM. Since both p-values are below 0.05, H_0 is rejected, indicating that the FEM is more appropriate than the CEM for this study.

Following this, the Hausman test was performed to further verify the most appropriate model by comparing the Fixed Effects Model (FEM) against the Random Effects Model (REM). The corresponding results are presented in Table 4.

Table 4. Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7.820021	3	0.0499

The Hausman test results in Table 4 show a probability value of 0.0499 ($p < 0.05$). The null hypothesis (H_0) states that the REM is appropriate, while the alternative hypothesis (H_1) supports the FEM. Since $p < 0.05$, H_0 is rejected, indicating that the FEM is more appropriate than the REM.

The LM test was not conducted because the Chow test had already rejected the CEM in favor of the FEM, and the Hausman test subsequently confirmed the FEM over the REM. Therefore, the LM test, which compares CEM and REM, was not required to determine the final model. This sequential procedure was applied consistently with the model selection criteria described in the methodology.

Table 5. Simultaneous F-Test Results

F-statistic	5.701780	Durbin-Watson stat	2.256088
Prob(F-statistic)	0.000001		

Table 6. Coefficient of Determination (Adjusted R^2) Test

R-squared	0.692965	Mean dependent var	0.221913
Adjusted R-squared	0.571430	S.D. dependent var	0.085735

Table 7. Partial t-Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Description
C	0.600521	0.106918	5.616676	0.0000	
EP	-0.009595	0.015185	-0.631896	0.5305	Negative, not significant
CSR	-0.097047	0.042918	-2.261219	0.0283	Negative, Significant at 5%
LV	-0.759189	0.197944	-3.835363	0.0004	Negative, Significant at 5%

Table 5 presents the results of the FEM estimation. The reported F-statistic value of 5.701780 with a probability value of 0.000001 indicates that the estimated regression model is statistically significant as a whole. However, this F-statistic represents the overall significance test of the FEM model, which may incorporate firm-specific fixed effects in addition to the explanatory variables. Therefore, this result should not be interpreted solely as a joint significance test of environmental performance, CSR and leverage. A specific joint significance test, such as the Wald test, is required if the objective is to assess the simultaneous effect of these three regressors.

The findings of the coefficient of determination are displayed in Table 6. Environmental performance, CSR and leverage account for 69.30% of the variance in financial performance, according to the model's R-squared value of 0.692965. At the same time, the factors included in the research model explain 57.14% of the variance in financial performance, according to the Adjusted R-squared value of 0.571430. This value takes into account both the number of explanatory variables and the fixed effects calculated in the model. Other, non-model variables account for the rest of the variance. Environmental performance (EP) has a negative coefficient of -0.009595 and a probability value of 0.5305 according to the partial regression findings shown in Table 7. There is no statistically significant relationship between environmental success and financial performance, as seen above. The suggested positive association between environmental performance and financial success is not confirmed by the empirical data, hence, H1 is not substantiated.

Additionally, CSR has a negative impact on financial performance at the 5% level of significance, as shown by a coefficient of -0.097047 and a probability value of 0.0283. While there is a strong correlation between CSR and financial performance, the premise is contradicted by the direction of the association. The empirical results show a negative association between CSR and financial success, contrary to the hypothesis's prediction of a positive effect. Hence, H2 is not supported. There may be some extra expenses in the near run due to the negative correlation between CSR disclosure and financial success. This might be because implementing CSR initiatives demands a significant investment of capital. On top of that, it could take a while for the financial gains from CSR initiatives to materialise, including enhanced credibility, confidence from stakeholders, and an edge over competitors. Consequently, higher CSR disclosure does not necessarily generate immediate improvements in financial performance.

Furthermore, the control variable leverage (LV) has a negative and statistically significant influence on financial performance, with a coefficient of -0.759189 and a probability value of 0.0004. Higher levels of borrowing are linked to worse financial performance, according to this analysis. An rise in reliance on debt financing may lead to higher interest expenditures and other financial responsibilities as well as more financial risk and worse profitability, as shown by the negative coefficient. Although leverage is included as a control variable, its significant magnitude demonstrates that capital structure represents an important factor influencing financial performance among Basic Materials companies.

Overall, the FEM estimation indicates that environmental performance does not significantly influence financial performance, while CSR and leverage exhibit significant negative relationships with financial performance. These findings highlight that sustainability-related activities and financing decisions may have different implications for short-term financial outcomes, particularly in the Basic Materials sector. The FEM-based panel data regression model is formulated and presented in the following section:

$$FP = 0.600521 - 0.009595(EP) - 0.097047(CSR) - 0.759189(LV) + \varepsilon$$

Discussion

The findings of the partial regression show that there is no significant relationship between environmental performance and financial success ($\beta = -0.0096$; $p = 0.5305$). This result is in line with those of [Azizah & Cahyaningtyas \(2022\)](#) and [Bellamy et al. \(2023\)](#), both of which found no statistically significant correlation between the environmental and financial performance of Indonesian businesses who took part in the PROPER evaluation system. The convergence of these findings suggests a distinctive pattern associated with compliance-based environmental performance measurement in Indonesia. Specifically, the PROPER rating primarily reflects compliance with government environmental regulations rather than environmental performance that exceeds minimum regulatory standards.

Table 8. Distribution of PROPER Categories Based on 68 Firm-Year Observations

PROPER Category	Score	Frequency	Percentage (%)
Gold (Emas)	5	11	16.18%
Green (Hijau)	4	15	22.06%
Blue (Biru)	3	40	58.82%
Red (Merah)	2	1	1.47%
Black (Hitam)	1	1	1.47%
Total		68	100%

The distribution of environmental performance based on the PROPER rating is presented in Table 8. The results show that the Blue category represents the largest proportion of observations, accounting for 40 out of 68 firm-year observations 58.82%. This indicates that most sampled companies generally fulfilled the minimum environmental management requirements established by the government. However, the dominance of the Blue category also suggests that most companies had not yet demonstrated environmental management practices that exceeded regulatory compliance standards.

Meanwhile, 15 observations 22.06% were classified as Green and 11 observations 16.18% achieved the highest Gold rating, indicating that several companies had implemented environmental management practices beyond basic compliance requirements. In contrast, only one observation each was classified as Red and Black, reflecting limited cases of lower environmental performance during the observation period.

These findings differ from those reported by [Liu et al. \(2020\)](#) and [Tjandrakirana \(2024\)](#), who documented a significant positive relationship between environmental performance and financial performance. This discrepancy is more plausibly explained by differences in measurement approaches and market contexts than by substantive contradictions. [Liu et al. \(2020\)](#) measured environmental performance using Bloomberg ESG scores, a continuous indicator applied in the mature U.S. capital market, where ESG performance is more directly incorporated into investors valuation decisions. By contrast, the present study employs the PROPER rating, an ordinal measure that provides limited differentiation among firms once minimum compliance has been achieved. Furthermore, [Tjandrakirana \(2024\)](#) focused on the healthcare sector, where environmental performance is more closely associated with service quality and public trust. Such mechanisms are less directly applicable to Basic Materials companies, whose environmental impacts primarily arise from extraction and production processes that are generally less visible to end consumers. Therefore, differences in measurement approaches and industry characteristics may provide possible explanations for the contrasting findings, although these factors were not directly tested in this study.

CSR disclosure has a negative and statistically significant effect on financial performance ($\beta = -0.0970$; $p = 0.0283$), contrary to the positive relationship proposed in H2. Therefore, H2 is rejected. This finding is consistent with [Nazwir & Raharja \(2024\)](#), who likewise reported that higher levels of CSR disclosure are associated with lower financial performance. The negative relationship between CSR disclosure and financial performance does not necessarily indicate that CSR costs reduce profitability, as this study measures CSR disclosure intensity rather than actual CSR expenditure. This finding may reflect short-term resource allocation, stakeholder pressures, or reporting requirements

associated with higher CSR disclosure. However, the relationship should be interpreted cautiously because it may also be influenced by reverse causality, omitted variables, or differences in firm characteristics. Companies with weaker financial performance may increase CSR disclosure as a response to stakeholder expectations and legitimacy pressures. Within the present sample, such a cost effect appears reasonable because companies in the Basic Materials sector operate in resource-intensive industries that require proportionally greater investments in environmental protection, community development, and occupational health and safety than firms operating in less resource-intensive sectors. One possible explanation is that CSR-related expenditures may be recognized as expenses in the same fiscal period, potentially lowering ROA. However, since CSR expenditure was not directly measured in this study, the model cannot establish this cost pathway, and the explanation remains speculative.

However, these findings contrast with those of [Najihah et al. \(2021\)](#) and [Tarigan et al. \(2025\)](#), who reported a significant positive relationship between CSR and financial performance. Methodological differences may partly explain this inconsistency. [Tarigan et al. \(2025\)](#) examined financial performance together with market share and idiosyncratic risk as mediating variables, thereby capturing indirect value-creation mechanisms, such as reduced risk premiums and enhanced market positioning, that are not reflected in a model based solely on ROA, as employed in the present study. Meanwhile, although [Najihah et al. \(2021\)](#) also used ROA and a GRI-based CSR disclosure index, their study focused on manufacturing firms in general rather than resource-intensive industries. Manufacturing firms with relatively lower environmental obligations may incur proportionally lower CSR-related costs, allowing reputational benefits to offset implementation costs within a comparable observation period. These results indicate that the degree to which a company's environmental risk profile is directly related to its CSR spending has a significant impact on the link between CSR and financial success.

These findings refine the application of Legitimacy Theory by demonstrating that legitimacy-seeking activities do not uniformly generate measurable short-term financial benefits. Instead, their financial outcomes depend on the operational cost intensity associated with sustainability initiatives and the sector-specific relationship between environmental risk and CSR obligations. In resource-intensive industries such as the Basic Materials sector, where compliance and disclosure costs constitute a relatively larger proportion of core operating activities, the cost dimension of legitimacy-seeking behavior may outweigh its immediate financial benefits, even though such activities continue to fulfill their legitimacy function. Accordingly, this study contributes to the literature by providing evidence from the Basic Materials sector, a resource-intensive industry in which the expected financial benefits of CSR disclosure were not observed during the 2021–2024 period. We interpret this finding in light of the sector's context: firms in resource-intensive industries face high environmental exposure and substantial operating and compliance demands, which may make it more difficult for CSR disclosure to translate into observable improvements in profitability within a relatively short period. Because resource intensity was not measured as a moderating variable and no comparison was made with less resource-intensive sectors, this interpretation remains contextual. We therefore propose, for future testing, that resource intensity may act as a boundary condition for the relationship between CSR disclosure and financial performance. This perspective extends previous Indonesian studies employing PROPER ratings and GRI-based CSR disclosure, particularly those conducted in sectors with lower environmental intensity ([Najihah et al., 2021](#)).

From a managerial perspective, these findings suggest that CSR expenditures and environmental compliance activities in resource-intensive industries should not be evaluated solely based on short-term profitability indicators. Instead, managers should also monitor legitimacy-related outcomes, such as reduced regulatory sanctions, improved community relations, and enhanced access to external financing, which may not be captured by ROA within a single fiscal period. For regulators, particularly the Ministry of Environment of the Republic of Indonesia, the absence of a significant financial effect associated with PROPER compliance suggests that the current incentive structure may not sufficiently encourage firms to exceed minimum environmental standards. The findings suggest that stronger incentive mechanisms may potentially help translate superior environmental performance into economic benefits. However, such policy implications require further evaluation, as this study is based on a limited sample of 17 firms. Future research may examine whether incentives such as preferential financing or streamlined licensing procedures

can strengthen the relationship between environmental performance and corporate financial outcomes. Finally, for investors, the negative short-term effect of CSR implies that CSR disclosure intensity should not be interpreted as a standalone indicator of short-term financial performance in the Basic Materials sector. Investment decisions should also consider firms' resource intensity and the scale of sustainability obligations associated with their operational activities. as the financial benefits of CSR may materialize only after legitimacy and stakeholder trust have been established over time (Ali et al., 2023)

LIMITATION

Several limitations are included in this investigation. To start, the model has two primary explanatory variables CSR as assessed by the GRI-based CSR disclosure index and EP, with Leverage (DAR) serving as the sole control variable. Firm size, growth opportunities, asset structure, age, corporate governance, ownership structure, commodity price exposure, and macroeconomic conditions are some of the time-varying factors that could impact financial performance. While the Fixed Effects Model accounts for unobserved time-invariant firm characteristics, it does not delve into other aspects. In particular, year effects were not incorporated into the model to capture common external factors affecting all firms during the observation period. Therefore, the omission of these variables may affect the estimated relationships.

Second, the potential endogeneity between sustainability performance or disclosure and financial performance should be acknowledged. Reverse causality cannot be completely ruled out, as firms with weaker financial performance may increase CSR disclosure to maintain legitimacy, while firms with stronger financial resources may have greater capacity to improve environmental practices. Since this study does not apply lagged specifications, instrumental variables, or other identification strategies, Instead of drawing conclusions about causes and effects, the results should be seen as correlations. The inability to determine if environmental performance and CSR disclosure have longer-term consequences is further compounded by the lack of delayed study.

Third, the sample selection process may introduce potential selection bias. The purposive sampling criteria require firms to consistently participate in PROPER and disclose CSR information based on the GRI Standards during 2021–2024. Consequently, the final sample of 17 firms may represent companies with stronger sustainability reporting practices and greater environmental management capabilities compared with the broader population of 109 Basic Materials firms. Therefore, the generalizability of the findings should be considered within the characteristics of the selected sample.

Fourth, the relatively small sample size, consisting of 17 firms and 68 firm-year observations, may limit statistical power and reduce the precision of the estimated coefficients. Moreover, because the Fixed Effects estimator relies on within-firm variation over time, the estimation of environmental performance effects depends on firms experiencing changes in PROPER ratings during the observation period. Firms with unchanged ratings provide limited variation for identifying the effect of environmental performance.

Fifth, Companies listed on the Indonesia Stock Exchange that are involved in Basic Materials are the sole subjects of this research. The results might not apply to businesses in other industries with various sustainability contexts and operational traits because of the resource-intensive nature of this industry and its comparatively high environmental exposure.

Sixth, the measurement of the main variables also has limitations. PROPER ratings are originally ordinal categories; therefore, converting them into a 1–5 scale may impose an assumption of equal distances between categories. However, additional robustness analyses using alternative coding approaches provide consistent results. Furthermore, CSR measurement based on the GRI Standards 2021 captures the extent of disclosure rather than actual CSR expenditure or the quality of CSR implementation. Therefore, the findings cannot determine whether CSR-related costs explain the observed relationship with financial performance. Future studies may consider alternative measures, such as ESG scores, CSR expenditure data, broader control variables, longer observation periods, as well as more effective methods of identification to shed light on the connection between sustainable measures and financial success.

CONCLUSION

The purpose of this study is to examine the relationship between EP, CSR, and Financial Performance in Basic Materials sector companies listed on the IDX 2021 - 2024. Leverage is considered as a control variable. The regression model is simultaneously related with Financial Performance, as indicated by the statistically significant estimated FEM ($F = 5.7018$; $p = 0.000001$). You shouldn't use this F-test as a test of the combined effect of EP, CSR, and Leverage; it shows the overall significance of the estimated model, including the fixed factors.

Various correlations among the variables are revealed by the partial test results. The correlation between EP and Financial Performance is not statistically significant ($\beta = -0.0096$; $p = 0.5305$). Financial Performance is negatively correlated with CSR disclosure ($\beta = -0.0970$; $p = 0.0283$) and leverage ($\beta = -0.7592$; $p = 0.0004$), however the other two variables had no such correlation.

It seems from these results that there was no significant relationship between environmental performance as judged by PROPER ratings and firm profitability during the study period. On the other hand, a worse ROI is linked to more CSR disclosure, as shown by the negative correlation between CSR disclosure and financial performance. This result does not necessarily imply that CSR activities or related costs reduce profitability, as this study measures CSR disclosure rather than actual CSR expenditure. One possible explanation is that CSR disclosure may involve additional resource allocation, reporting requirements, or stakeholder pressures that could influence short-term financial outcomes; however, this interpretation remains speculative and requires further investigation. Overall, the findings indicate that sustainability-related practices in resource-intensive sectors do not automatically translate into immediate financial improvements. The relationship between environmental performance, CSR disclosure, and financial performance may depend on various firm-specific and external factors, including the time required for sustainability initiatives to generate measurable economic benefits.

Theoretical Implications

These findings extend the application of Legitimacy Theory to resource-intensive industries by showing that legitimacy-seeking mechanisms through environmental compliance and CSR disclosure do not automatically yield direct financial benefits within the observed period. The findings also suggest that the financial benefits of legitimacy-building activities may take time to materialize. Future research could therefore examine cost intensity and longer observation periods or lagged effects to better capture the potential delayed financial benefits of environmental and CSR activities.

Practical Implications

In order to turn the expenses into a competitive advantage in the long run, CSR initiatives should be designed to be linked with core company strategy rather than seen as administrative compliance. This is something that corporate management should keep in mind. Regulators, especially the Indonesian Ministry of Environment and Forestry (KLHK), should take note that the research sample did not demonstrate a statistically meaningful association between Financial Performance and Environmental Performance (as defined by PROPER). This finding may provide input for evaluating the broader role of environmental performance in supporting corporate financial outcomes. For investors, the negative short-term effect of CSR underscores the importance of evaluating corporate sustainability performance from a long-term perspective rather than based solely on its immediate impact on current-period earnings.

AUTHOR CONTRIBUTIONS

The first author was involved in coming up with the idea for the study, reviewing the literature, gathering data, analysing the data, interpreting the results, and preparing the paper. Supervision of the research, formulation of the methodology, critical evaluation, and article refining were all responsibilities of the second author. At this point in time, all writers have reviewed and approved the work as written.

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