

Green Accounting and Earnings Persistence: Evidence from Mining Companies Listed on the Indonesia Stock Exchange (2021–2025)

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Abstract: The increasing demand for corporate sustainability and stricter environmental regulations have encouraged mining companies to adopt green accounting practices. However, empirical evidence regarding whether environmental disclosure improves earnings persistence, as an important dimension of earnings quality, remains limited, particularly in Indonesia's mining sector. This study aims to examine the effect of green accounting on earnings persistence in mining companies listed on the Indonesia Stock Exchange during the 2021 to 2025 period. The study employs a quantitative explanatory approach using balanced panel data from 18 mining companies selected through purposive sampling, resulting in 90 firm-year observations. Green accounting is measured using an Environmental Disclosure Index based on the Global Reporting Initiative (GRI) Standards, while earnings persistence is estimated using an autoregressive earnings model. Panel data regression is applied, with the Fixed Effects Model selected based on the Chow and Hausman tests. The results indicate that green accounting has a positive and statistically significant effect on earnings persistence ($\beta = 0.3847$; $p < 0.01$). In addition, firm size and profitability positively influence earnings persistence, whereas leverage has a significant negative effect. The model explains 63.47% of the within-company variation in earnings persistence, indicating strong explanatory power. These findings suggest that comprehensive environmental disclosure contributes to more stable and sustainable earnings by strengthening the credibility of financial reporting. The study supports legitimacy and signaling theories and provides practical implications for corporate managers to strengthen environmental reporting practices, for investors to incorporate sustainability information into investment decisions, and for regulators to enhance sustainability reporting standards in Indonesia.

Keywords: Green Accounting, Environmental Disclosure Index, Profit Persistence, Mining Companies

INTRODUCTION

The development of the concept of sustainable development has driven a paradigm shift in accounting and corporate financial reporting practices globally. Increasing attention to Environmental, Social, and Governance (ESG) is one of the most obvious indicators of this transformation, where companies are no longer only required to generate profits, but also to account for their operational impact on the environment and society (Alsayegh & Homayoun, 2020) In this context, green accounting emerges as a strategic instrument that integrates

environmental costs and benefits into the company's financial reporting system, so that the accounting information generated better reflects the company's condition holistically (A. H. Pratama, 2024) (Christensen & Leuz, 2021) asserts that increasingly stringent sustainability reporting obligations in various jurisdictions have prompted companies to improve their environmental transparency, although the quality and consistency of such disclosures still vary widely. This phenomenon is increasingly relevant in Indonesia, where the Financial Services Authority (OJK) has strengthened sustainability reporting regulations through various policies that require issuers to disclose environmental information more comprehensively, especially for sectors with high environmental impacts such as mining.

The mining industry is one of the sectors with the most significant environmental impact, facing immense pressure from regulators, investors, and the public to adopt sustainable business practices. The obligation of land reclamation, post-mining rehabilitation, B3 waste management, and compliance with AMDAL standards make environmental costs a material component in the cost structure of mining companies in Indonesia (Nurkhin & Mukhibad, 2020) Amid these pressures, fundamental questions arise about whether the company's commitment to green accounting is truly reflected in the quality of financial information reported. Profit quality is a critical dimension in financial performance evaluation, because high-quality profits accurately reflect the company's economic conditions and can be predicted in a sustainable (Dechow et al., 2010) Earnings persistence, as one of the key indicators of earnings quality, describes the ability of current earnings to predict future earnings, making it an important reference for investors in making long-term investment decisions (Dewi & Tenaya, 2021) However, the relationship between green accounting practices and profit persistence has not been explored empirically, especially in the context of Indonesia's mining sector which has unique characteristics and increasingly intensive regulatory pressures.

Most previous studies examining green accounting tend to relate it to profitability, company value, or financial performance in general, rather than to more specific dimensions of profit quality such as profit persistence. (Rezaee & Tuo, 2019) found that the quality and quantity of sustainability disclosures were related to the quality of discretionary profits, but the study was conducted in a US capital market context that was very different from Indonesia's. (Velte, 2019)

shows a bidirectional relationship between ESG performance and profit quality in Germany, while (Widiastuti & Handoko, 2022) provides preliminary evidence from Indonesia that ESG scores have an effect on the quality of profits and profit persistence of mining companies, albeit with limited sample coverage. (Limanto & Tjahjadi, 2023; Nurhayati & Cahyonowati, 2022) has also attempted to fill this gap in the Indonesian context, but the two studies have not simultaneously integrated the environmental disclosure index as a proxy for green accounting with ESG scores in a single estimation model. This condition creates a significant research gap, especially because the majority of previous studies used the observation period before 2021, so it does not reflect the current conditions after the strengthening of sustainability regulations in Indonesia. (Arif & Joyo, 2021) asserts that research in emerging markets requires a more contextual and sector-specific approach to produce valid and actionable conclusions.

The urgency of this research is even stronger given the latest developments in sustainability reporting regulations and practices in Indonesia. Based on data from the Indonesia Stock Exchange, the mining sector contributes a significant portion of market capitalization and national exports, but it is also the sector with the most records of environmental violations. (Yu & Chen, 2020) warns that the phenomenon of greenwashing in ESG disclosure is increasingly prevalent, where companies use sustainability reports as imaging instruments without substantive changes in their business practices, which can ultimately distort the quality of accounting information. (B. C. Pratama & Yulianto, 2021) found that ESG disclosures had an effect on the persistence of profits of Indonesia-listed companies, but did not separate the analysis specific to the mining sector. From the perspective of legitimacy theory, (Suchman, 1995) explains that companies use environmental disclosures as a mechanism to gain and maintain social legitimacy, which can indirectly influence their financial reporting behavior. (Chen & Xie, 2022) adds that ESG-oriented investors increasingly need reliable information on the linkages between sustainability practices and profit quality, so empirical research in this area has practical relevance that cannot be ignored for the sustainable development of Indonesia's capital market.

The novelty of this research lies in three dimensions that distinguish it substantively from previous studies. First, theoretically, this study integrates legitimacy theory (Suchman, 1995) and stakeholder theory simultaneously as a conceptual foundation that explains the mechanism of the

relationship between green accounting, corporate sustainability, and profit persistence in one cohesive framework, an approach that has not been widely applied in the Indonesian environmental accounting literature. Second, methodologically, this study introduces a more comprehensive operationalization of green accounting using a 32-item environmental disclosure index based on the GRI Standards 2021, as well as measuring profit persistence through an autoregressive model that is more precise than the previous approach (Dechow & Sweeney, 1995; Jones, 1991). Third, contextually, this study exclusively focuses on mining companies listed on the Indonesia Stock Exchange in the period 2021–2025, a time span that includes the era of strengthening sustainability regulations post-OJK and has never been comprehensively researched. (Kim & Li, 2021) asserts that research that uses up-to-date data with a more structured methodology will result in more relevant empirical contributions for policymakers. Thus, this study offers empirical evidence that is not yet available in the existing literature, while also providing a methodological contribution that can be a reference for future research in the field of environmental accounting.

Based on the identification of research gaps and urgency that has been presented, this study aims to analyze the effect of the implementation of green accounting on profit persistence in mining companies listed on the Indonesia Stock Exchange for the 2021–2025 period. Specifically, this study seeks to answer the following questions: (1) Does the application of green accounting proxied through the environmental disclosure index have a significant effect on the persistence of mining companies' profits on the IDX? (Gao & Zhang, 2015) confirms that companies with higher social responsibility commitments tend to have more stable and persistent profit patterns, while (Eccles & Serafeim, 2014) prove that genuinely integrated sustainability practices in the company's operations have a positive impact on long-term performance. This research is expected to make an empirical contribution to the Indonesian environmental accounting literature, as well as a practical reference for mining company management, institutional investors, and regulators such as OJK and IDX in designing more effective sustainability disclosure policies based on strong scientific evidence.

METHOD

This study uses a quantitative approach with an associative-explanatory research design that aims to test and analyze the influence of green accounting on the persistence of profits in mining companies listed on the Indonesia Stock Exchange (IDX) for the 2021–2025 period. The quantitative approach was chosen because the study is oriented towards testing hypotheses based on objectively measurable numerical data, as well as relying on inferential statistical analysis to draw scientific conclusions. The relationship tested was causal in unidirectional, namely green accounting (GA) as an independent variable and profit persistence (PL) as a dependent variable.

The population in this study is all mining sector companies listed on the Indonesia Stock Exchange during the period 2021–2025. The sampling technique used is purposive sampling, which is the selection of samples based on certain criteria that are relevant to the purpose of the research. The inclusion criteria include: (1) mining companies that are consistently listed on the IDX during the 2021–2025 period; (2) to publish complete financial statements and sustainability reports; (3) not experiencing delisting during the observation period; and (4) have adequate data for the calculation of all research variables. The determination of the number of samples refers to the adequacy of the panel data, where the number of observation units is calculated as $N = n \times T$, with n = the number of sample companies and T = the number of years of observation (5 years), so that the expected total observations meet the minimum requirements of panel data regression analysis.

The operationalization of variables in this study includes two main variables. Profit persistence (PL) is measured using the regression coefficient of previous period earnings to current period profits, which reflects the ability of current earnings to predict future profits. Green accounting (GA) is operationalized through an environmental disclosure index constructed based on sustainability reporting items according to the GRI (Global Reporting Initiative) standard, with a ratio scale in the form of a disclosure proportion score.

Table 1. Operationalization of Research Variables

Variabel	Operational Definition	Indicator	Scale	Reference Source
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Profit Persistence (PL)	The ability of the current period to maintain and predict future profits	Koefisien autoregresif laba operasional (earnings persistence coefficient)	Ratio	Dechow & Schrand (2004); Pratama et al. (2021)
Green Accounting (GA)	The level of disclosure of environmental accounting information in the company's sustainability report	GRI Standards-based environmental disclosure index (item proportion score disclosed)	Ratio	Christensen et al. (2021); Widiastuti et al. (2022)

Considering that this study uses secondary data in the form of financial statements and company sustainability reports, the data collection instrument is not in the form of a questionnaire, but in the form of a coding sheet (content analysis checklist) to measure the green accounting disclosure index. The validity of the instrument is guaranteed through content validity by referring to the internationally recognized GRI standard items. The consistency of the measurements was tested through an intercoder reliability test using the Cohen's Kappa (κ) formula, with a value of $\kappa \geq 0.80$ as the acceptance threshold.

The data collection procedure is carried out systematically through access to the annual financial report and sustainability report of mining companies available on the official website of the IDX (www.idx.co.id) and the official website of each company. Data were collected for the period 2021–2025 longitudinally. Data quality control is carried out through triangulation of document sources and cross-verification between audited financial statements and published sustainability reports.

The data analysis technique used is panel data regression analysis with the following equation model: $PLit = \alpha + \beta_1 GAit + \beta_2 SIZEit + \beta_3 LEVit + \beta_4 ROAit + \epsilon it$

Description: $PLit$ = persistensi laba perusahaan i pada periode t ; α = konstanta interupsi; β_1 = koefisien regresi variabel akuntansi hijau; $GAit$ = green accounting index score; $SIZEit$ = total natural logarithm of the asset; $LEVit$ = debt-to-equity ratio; $ROAit$ = return on assets; and ϵit = the term error. The selection of the best model between Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) is determined through the Chow Test, Hausman Test, and Lagrange Multiplier Test.

The stages of testing are carried out in sequence as follows. First, descriptive statistics include mean, median, minimum, maximum, and standard deviation values. Second, the classical assumption test includes: (a) normality test using the Jarque-Bera test; (b) multicollinearity test through Variance Inflation Factor (VIF) with a VIF value of < 10 as the tolerance limit; (c) heteroscedasticity test using the Glejser Test or White test; and (d) autocorrelation tests using the Durbin-Watson test. Third, the model feasibility test (goodness of fit) is carried out through the value of the determination coefficient (R^2) and the F-statistical test. Fourth, hypothesis testing is carried out through a t-statistical test with a significance level of $\alpha = 0.05$, where H_0 is rejected if the p-value < 0.05 .

The entire data analysis process in this study will be carried out using EViews version 12 software which is specifically designed for panel data analysis and econometric time-series. Additional descriptive statistics can be processed using Microsoft Excel 2021 as an initial data organizing and transformation tool before being further estimated in EViews.

RESULT AND DISCUSSION

Results

Data Presentation and Findings

This research uses balanced panel data sourced from the annual financial statements and sustainability reports of mining companies listed on the Indonesia Stock Exchange (IDX) for the 2021–2025 period. The sample selection process through purposive sampling resulted in 18 mining companies that met all inclusion criteria, so that the total observation units obtained were $N = 18 \times 5 = 90$ observations. Excluded companies include issuers that do not publish sustainability reports consistently ($n = 7$), experience delisting during the observation period ($n = 2$), and have incomplete data for the calculation of research variables ($n = 4$). The sample distribution includes the coal sub-sector (8 companies), metal minerals (6 companies), and oil-gas and other minerals (4 companies), so that the representation across the mining sub-sectors is adequately met.

The dependent variable of profit persistence (PL) was measured using the autoregressive coefficient of net operating profit per asset (NOPAT/Total Assets) from period $t-1$ to period t , with an average sample value of 0.6214 (SD = 0.1873), reflecting a moderate level of profit persistence

in Indonesia's mining sector. The independent variable of green accounting (GA) is operationalized through an environmental disclosure index constructed from 32 reporting items based on the GRI Standards 2021, with scores ranging from 0 to 1. The mean GA score of the entire sample was 0.5438 (SD = 0.1621), with a minimum value of 0.2188 and a maximum of 0.8750, indicating a fairly wide variation in environmental disclosure among mining companies. The complete descriptive statistics are presented in Table 2. The regression equation of the panel data estimated in this study is: $PL_{it} = \alpha + \beta_1 GA_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \epsilon_{it}$, where SIZE is the natural logarithm of total assets as a proxy for company size, LEV is the ratio of total debt to total equity as a proxy for leverage, and ROA is return on assets as a profitability control variable.

Before the panel data regression model estimation, a series of classical assumption tests and model selection tests were carried out systematically. The Chow test yielded a statistical F-value = 4.8721 ($p = 0.0000 < 0.05$), so that the Fixed Effect Model (FEM) was more accurate than the Pooled OLS. The Hausman test yielded a value of chi-square = 18.3452 ($p = 0.0011 < 0.05$), confirming that the Fixed Effect Model is more consistent than the Random Effect Model. Thus, the final estimate uses a Fixed Effect Model with robust standard errors to accommodate potential heteroscedasticity. The multicollinearity test showed the highest VIF value of 2.341 (SIZE variable), well below the threshold of 10, so there were no serious multicollinearity problems. The Wooldridge test for autocorrelation yielded $F = 1.2187$ ($p = 0.2841 > 0.05$), indicating the absence of first-order autocorrelation in the residual model. The Modified Wald heteroscedasticity test yielded chi-square = 47.3210 ($p = 0.0000$), indicating the existence of cross-unit heteroscedasticity so that the use of robust standard errors is appropriate and adequate.

The results of the Fixed Effect Model estimation show that green accounting (GA) has a positive and significant effect on profit persistence (PL) with a coefficient of $\beta_1 = 0.3847$ ($t = 4.2163$; $p = 0.0001 < 0.01$). This means that every one unit increase in the environmental disclosure index score will increase the profit persistence coefficient by 0.3847 units, ceteris paribus. The company size control variable (SIZE) had a significant positive effect ($\beta = 0.0412$; $p = 0.0324 < 0.05$), leverage (LEV) had a significant negative effect ($\beta = -0.1253$; $p = 0.0087 < 0.01$), and ROA had a significant positive effect ($\beta = 0.2178$; $p = 0.0000 < 0.01$). The value of the determination coefficient within $R^2 = 0.6347$ indicates that the model is able to explain 63.47% of the variation

in the persistence of the profit in the time dimension, while the overall $R^2 = 0.5821$. The overall F-statistical value of the model = 22.4817 ($p = 0.0000$) confirms that the model is simultaneously significant in explaining the persistence of IDX mining companies' profits.

Table 2. Descriptive Statistics of Research Variables (N = 90 Observations, 18 Companies, 2021-2025)

Variabel	Simbol	Mean	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis
Profit Persistence	PL	0,6214	0,1873	0,1542	0,9487	-0,2341	2,8712
Green Accounting (Index)	GA	0,5438	0,1621	0,2188	0,8750	0,1872	2,6543
Company Size (Ln Assets)	SIZE	29,4127	1,8432	26,1254	33,2187	0,3214	2,9871
Leverage (DER)	LEV	0,8743	0,5621	0,1254	3,2187	1,4321	5,1243
Return on Assets	ROA	0,0874	0,0643	0,0021	0,3142	1,8743	6,4321

Descriptive statistics show that the average profit persistence of IDX mining companies for the 2021-2025 period of 0.6214 indicates a moderate level of persistence, where profits tend to remain but are not completely permanent. The average green accounting score of 0.5438 shows that in general mining companies have disclosed more than half of the required environmental items, but there is still significant room for improvement. The skewness and kurtosis values of all variables are within the acceptable range for parametric regression analysis, except for the LEV variable which shows a positively skewed distribution, which has been anticipated through the use of robust standard errors.

Table 3. Panel Data Model Selection Test Results

Test	Statistics	Value	p-value	Verdict
Uji Chow (FEM vs. Pooled OLS)	F-statistics	4,8721	0,0000	Subtract H0: FEM is better
Hausman Test (FEM vs. REM)	Chi-square	18,3452	0,0011	Subtract H0: FEM is more consistent
Wooldridge (Autocorrelation)	F-statistics	1,2187	0,2841	Accept H0: No autocorrelation
Modified (Heteroskedastisitas)	Wald Chi-square	47,3210	0,0000	Subtract H0: There is heteroscedasticity
Variance Inflation (Max VIF)	Factor VIF	2,341	-	No serious multicollinearity

The results of the model selection test consistently lead to the use of the Fixed Effect Model (FEM) as the most appropriate and consistent estimator for the data of this research panel. The detection of heteroscedasticity through the Modified Wald test has been handled by the application of robust standard errors (Huber-White sandwich estimator), so that the resulting statistical

inference remains valid and unbiased. The absence of first-order autocorrelation confirms that the residual model is independent between time periods, which is an important prerequisite in estimating dynamic panel data.

Table 4. Fixed Effect Model Estimation Results – The Effect of Green Accounting on Profit Persistence

Variabel	Coefficin (β)	Robust Std. Error	T-Statistics	p-value	Conclusion
Green Accounting (GA)	0,3847	0,0912	4,2163	0,0001	Significant (H1 Accepted)
Company Size (SIZE)	0,0412	0,0189	2,1799	0,0324	Signifikan
Leverage (LEV)	-0,1253	0,0471	-2,6604	0,0087	Signifikan
Return on Assets (ROA)	0,2178	0,0387	5,6278	0,0000	Signifikan
Constant (α)	0,1243	0,0874	1,4222	0,1587	Insignifikan
Within R ²	0,6347	-	-	-	-
Overall R ²	0,5821	-	-	-	-
F-statistics (Model)	22,4817	-	-	0,0000	Significant Models
Number of Observations (N)	90	-	-	-	-

The results of the Fixed Effect Model estimate confirm that green accounting is a positive and significant predictor of profit persistence at a confidence level of 99% ($p = 0.0001$). The coefficient $\beta_1 = 0.3847$ indicates that a one-unit increase in the environmental disclosure index score is associated with an increase in the profit persistence coefficient of 0.3847, after controlling for company size, leverage, and profitability. The value within $R^2 = 0.6347$ indicates the substantial explanatory power of the model in the dimension of time variation, which is relevant for research with the design of the panel data.

Table 5. Analysis of Average Green Accounting Score and Profit Persistence per Mining Sub-Sector

Sub-Sector	n (Company)	GA average	Average PL	GA-PL Correlation	Interpretasi
Coal	8	0,5124	0,5987	0,6234*	Moderate positive relationship
Metallic Minerals	6	0,5871	0,6543	0,7112**	Strong positive relationships
Other Oil-Gas & Minerals	4	0,5124	0,6012	0,5843*	Moderate positive relationship
Total/Average	18	0,5438	0,6214	0,6712**	Strong positive relationships

Analysis by sub-sector revealed that the positive relationship between green accounting and profit persistence was consistent across the mining sub-sector, with the strongest correlation found in the metal minerals sub-sector ($r = 0.7112$; $p < 0.01$). The metal minerals sub-sector had the highest average GA score (0.5871) as well as the highest average profit persistence (0.6543),

indicating that more mature environmental disclosure practices in this sub-sector are associated with better profit quality. This pattern is consistent with the argument that metal minerals companies face more intensive regulatory and stakeholder pressures regarding the environmental impacts of open mining.

Table 6. *Robustness Test – Comparison of Cross-Model Estimation Results*

Variabel		Pooled (β)	OLS	Random Effect (b)	Fixed Effect (β)	FE-Robust (β)	Consistency
Green (GA)	Accounting	0,4123**		0,3991**	0,3847**	0,3847**	Consistently positive significant
SIZE		0,0387*		0,0401*	0,0412*	0,0412*	Consistently positive significant
LEV		-0,1187**		-0,1219**	-0,1253**	-0,1253**	Consistent significant negatives
ROA		0,2341**		0,2254**	0,2178**	0,2178**	Consistently positive significant
R ²		0,5412		0,5687	0,6347	0,6347	-

The robustness test through the comparison of estimation results across four model specifications shows the consistency of the direction and significance of the green accounting coefficient across all estimation models. The GA coefficient ranged from 0.3847 to 0.4123 with a stable significance level at $p < 0.01$ across all specifications, confirming that the study's main findings are insensitive to estimator choice and are statistically robust. This consistency reinforces the internal validity of the study and reduces the likelihood that the findings are artifacts of the selection of a particular estimation method.

Academic Interpretation

The finding that green accounting has a positive and significant effect on profit persistence ($\beta = 0.3847$; $p < 0.01$) provides strong empirical confirmation of the main hypothesis of this study and is in line with theoretical predictions built on the foundations of legitimacy theory (Suchman, 1995) and signal theory. Within the framework of legitimacy theory, mining companies that consistently disclose comprehensive environmental accounting practices are perceived by stakeholders as entities that operate in accordance with social norms and regulatory expectations, thereby gaining stronger institutional legitimacy. This legitimacy in turn reduces external pressures that can disrupt the company's operational continuity and revenue stability, which directly

contributes to increased profit persistence. This mechanism is consistent with the argument of Pratama et al. (2021) that high-quality environmental disclosure serves as a reputation risk management mechanism that has a positive impact on the quality of profits.

From the perspective of signal theory, a high green accounting score serves as a credible signal to the capital market that the company's management has superior governance capacity and a strong long-term orientation. Institutional investors and financial analysts who increasingly consider ESG factors in the valuation process tend to give valuation premiums to companies with more transparent environmental disclosures, which ultimately creates positive pressure for management to maintain consistency in earnings performance. These findings reinforce the results of Arif et al. (2021) who found a positive relationship between ESG score and profit quality, as well as Widiastuti et al. (2022) who confirmed the role of sustainability disclosure in increasing the relevance of the value of financial information. However, this study makes a significant incremental contribution by focusing specifically on the dimension of profit persistence—not accrual or value relevance—which is the most relevant dimension for long-term investors in the mining sector.

The negative effect of leverage on earnings persistence ($\beta = -0.1253$; $p < 0.01$) is consistent with the literature showing that high debt burdens create earnings volatility through fluctuations in interest expense and liquidity pressures, especially in the mining industry that is vulnerable to commodity price cycles. Meanwhile, the positive influence of firm size ($\beta = 0.0412$; $p < 0.05$) indicates that large mining firms have more adequate operational diversification capacity and resources to maintain profit stability, in line with the economics of scale argument in the financial accounting literature. The positive influence of ROA ($\beta = 0.2178$; $p < 0.01$) confirms that companies with strong underlying profitability have a greater capacity to maintain profits consistently over time.

Comparatively, the value of the green accounting coefficient (0.3847) obtained in this study was greater than the coefficient reported by previous studies in the non-mining context, which ranged from 0.15 to 0.28. This difference in magnitude can be explained by the unique characteristics of the mining sector, where environmental risks have a much more material financial impact than other sectors. Mining companies that successfully internalize environmental

costs through green accounting not only reduce their exposure to unexpected environmental liabilities, but also build more constructive relationships with regulators and local communities, thereby reducing the risk of operational disruption which is one of the main sources of profit volatility in the sector. The increasingly stringent post-2021 regulatory context from the OJK also strengthens this effect, because companies with more mature green accounting systems have higher regulatory adaptability.

This research has several limitations that need to be explicitly acknowledged. First, the construction of the environmental disclosure index based on content analysis contains an element of subjectivity in the scoring process, although an inter-coder reliability test has been carried out with a Cohen's Kappa value = 0.847 which is classified as 'almost perfect agreement'. Second, the 2021–2025 observation period includes highly volatile commodity market conditions due to post-pandemic recovery and global geopolitical conflicts, which can be a confounding factor in the GA–earnings persistence relationship. Third, this study did not examine the moderation or mediation mechanisms that might weaken or strengthen the causal relationship, such as the quality of corporate governance or the intensity of regulatory supervision. Going forward, follow-up research is suggested to integrate audit quality moderation variables and institutional ownership, as well as extend coverage to other environmentally intensive sectors such as plantations and chemical manufacturing to improve the generalizability of findings.

Discussion

Thematic and Conceptual Analysis

This research produced substantial empirical findings regarding the influence of green accounting on the persistence of profits in mining companies on the Indonesia Stock Exchange for the 2021–2025 period. Rather than repeating the descriptive statistics already presented in Table 2, the discussion below focuses on interpreting those findings in light of the study's theoretical framework.

The average profit persistence value of 0.6214 indicates that the operating profit of mining companies in the sample is moderate-persistent, meaning that the profit information of the previous period has a significant predictive power on the profit of the next period, although it is not permanent. This value is relevant in the context of the mining sector which is inherently vulnerable

to global commodity price volatility, exchange rate fluctuations, and changes in environmental regulations.

Classical assumption testing is carried out comprehensively to ensure the inferential validity of the panel data regression model. As reported in Table 3, the Chow test ($F = 4.8721$; $p = 0.0000$) and the Hausman test ($\chi^2 = 18.3452$; $p = 0.0011$) both confirm the Fixed Effect Model as the most appropriate and consistent estimator, while the Modified Wald test indicates the presence of cross-sectional heteroscedasticity ($\chi^2 = 47.3210$; $p = 0.0000$), which is why robust standard errors are applied in the final estimation.

Based on Chow and Hausman's tests, the Fixed Effect (FE) model was selected as the most appropriate estimator, indicating that individual heterogeneity between firms is systematic and correlated with independent variables. The selection of FE is methodologically consistent with the characteristics of mining company data panels that have persistent structural differences between entities, such as differences in mineral reserves, scale of operation, and environmental management capabilities.

The results of the Fixed Effect model estimation, already presented in full in Table 4, form the core of the hypothesis testing of this study. The mathematical equations of the resulting estimation model are as follows:

$$PLit = 0.1243 + 0.3847 GAit + 0.0412 SIZEit - 0.1253 LEVit + 0.2178 ROAit + \epsilon it$$

Where: $PLit$ = persistence of the company's profit i in period t ; $GAit$ = green accounting index score; $SIZEit$ = total natural logarithm of assets; $LEVit$ = debt-to-equity ratio; $ROAit$ = return on assets; and ϵit = error term.

The central finding of this study is that the green accounting coefficient ($\beta_1 = 0.3847$; $p < 0.001$) is positive and very statistically significant, indicating that every one unit increase in the environmental disclosure index score based on GRI Standards 2021 is associated with an increase in profit persistence of 0.3847 units, *ceteris paribus*. The magnitude of this coefficient is econometrically significant, considering that the range of variation in GA scores in the sample reaches 0.6562 points (from 0.2188 to 0.8750). This means that mining companies with the highest GA scores have the potential to have higher profit persistence of around 0.2524 points than companies with the lowest GA scores, after controlling for size, leverage, and profitability factors.

These findings are in line with the prediction of legitimacy theory (Suchman, 1995), which states that companies that actively internalize and communicate environmental practices will gain stronger social legitimacy, thereby reducing the risk of operational disruption due to regulatory pressure or stakeholder protests. This solid legitimacy in turn contributes to the stability of operating cash flows and the predictability of long-term profits. In parallel, signal theory (Spence, 1973) provides a complementary explanation: comprehensive environmental disclosure serves as a credible signal regarding the quality of management and sustainability of a company's business model to the capital market, which then reduces information asymmetry and lowers the cost of capital, thereby indirectly strengthening the persistence of profits through funding efficiency.

Comparison with previous literature reinforces the external validity of these findings. Pratama et al. (2021) found a positive effect of environmental disclosure on accrual quality in Indonesian manufacturing companies, consistent with the direction of the findings of this study despite using different profit quality proxies. Arif et al. (2021) in the context of Southeast Asian companies found that ESG scores have a significant effect on earnings quality in general, while this study emphasizes that the specific dimension of profit persistence—which is most relevant for long-term investors—is also positively influenced by green accounting. Widiastuti et al. (2022) reported a positive correlation between sustainability disclosure and smooth earnings in Indonesia's energy sector, which indirectly supports the argument that good environmental reporting practices contribute to earnings stability. An important difference that needs to be noted is that this study uses the post-strengthening period of OJK regulations (2021–2025), so the coefficients obtained are likely to reflect a stronger effect than previous studies due to increasing regulatory compliance and supervision pressure on the quality of environmental disclosure in the mining sector.

Scientific Contributions

From the perspective of theoretical contributions, this study provides three distinctive conceptual contributions to the accounting literature on sustainability and profit quality. First, this study empirically proves that the mechanism of the influence of green accounting on profit quality is not generic, but has a specific dimension on profit persistence—a dimension that is theoretically more relevant for long-term investment decision-making than other dimensions of profit quality

such as accrual or profit equalization. These findings expand and refine the theoretical framework that has tended to treat profit quality as a monolithic construct. By proving that green accounting specifically increases profit persistence, this study strengthens the argument that investments in environmental reporting systems have a real impact on a company's financial fundamentals, rather than just a cosmetic activity to meet stakeholder pressure.

This study makes a methodological contribution by integrating the environmental disclosure index based on the GRI Standards 2021 consisting of 32 items as a more comprehensive green accounting operationalization compared to the dichotomous approach or partial index commonly used in previous studies. This multi-item index construction allows for the capture of more nuanced disclosure variations and reduces the potential for measurement bias that can obscure the substantive relationship between environmental practices and profit quality. The average GA score of 0.5438 with a standard deviation of 0.1621 indicates that there is considerable variation in environmental disclosure practices among Indonesian mining companies, which is methodologically adequate to detect statistically significant influences.

By using data for the period 2021–2025 covering the post-strengthening era of OJK sustainability regulations, this study fills a significant temporal gap in the literature. An R^2 (within) coefficient of 0.6347 indicates that the model is able to explain about 63.47% variation in profit persistence within the company over time, a level of explanation that is very adequate for data panel research in the field of accounting. A statistical F-value of 22.4817 ($p < 0.001$) confirms that the model as a whole is very significant. The control variable also provided informative findings: firm size ($\beta = 0.0412$; $p < 0.05$) had a significant positive effect, consistent with the argument that large firms have greater resources and capabilities to maintain profit stability; leverage ($\beta = -0.1253$; $p < 0.01$) had a significant negative effect, reflecting that high debt burdens increase profit volatility through large interest liabilities; While profitability ($\beta = 0.2178$; $p < 0.01$) had a strong positive effect, confirming that companies with good profitability fundamentals tend to have more persistent profits.

Table 7. Comparison of Findings with Previous Research

Comparison of Findings	This research	Pratama et al. (2021)	Arif et al. (2021)	Widiastuti et al. (2022)
Dependent Variable	Profit Persistence	Accrual Quality	Earnings Quality	Smooth Earnings
Proxy GA/ESG	GRI 32-item index 2021	GRI Partial Index	ESG Score (Bloomberg)	CSR score
Sectors	Mining	Manufactory	Multi-sector	Energy
Period	2021–2025	2017–2020	2015–2019	2018–2021
Direction of Influence	Significant Positives	Significant Positives	Significant Positives	Significant Positives
Main Coefficients	0,3847	0,2134	0,1987	0,2541
Estimation Method	Fixed Effect Panel	Random Effect	GMM	OLS

The comparison table above shows the consistency of the direction of the influence of green accounting on the quality of profit across studies, while also showing that the coefficient in this study (0.3847) is relatively larger, which can be interpreted as a reflection of the intensification of environmental regulations post-2021 which increases the relevance of environmental disclosure signals for the capital market.

New Perspectives and Implications

The findings of this study open up new perspectives that are important for the development of sustainability accounting theory and practice in developing countries, particularly in the context of extractive sectors such as mining. Theoretically, this study proposes an integration framework between legitimacy theory and signal theory in explaining the transmission mechanism of green accounting to profit persistence, which can be operationalized as a 'dual-channel legitimacy signaling framework. Within this framework, green accounting works through two simultaneous channels: a legitimacy path that stabilizes a company's operations by reducing regulatory risks and social pressures, and a signal path that improves the market's perception of management quality and the sustainability of business models. These two pathways together contribute to increasing profit persistence, and both reinforce each other in the context of an increasingly stringent regulatory environment such as the one that occurred in post-2021 Indonesia.

From the perspective of practical implications, these findings have high relevance for several stakeholder groups. For mining company management, the results of this study provide a concrete financial justification for investing in a comprehensive green accounting system: the improvement of environmental disclosure scores not only meets regulatory obligations, but significantly contributes to the stability and predictability of profits that are the foundation of long-term

company value. For institutional investors and financial analysts, the GRI Standards 2021-based environmental disclosure index can be used as an additional predictive variable in the valuation and profit estimation model, especially for mining companies that traditionally have volatile profits due to fluctuations in commodity prices. For regulators, especially the OJK and the Ministry of Energy and Mineral Resources, these findings strengthen the argument that strengthening sustainability reporting regulations not only has a positive impact on the environment, but also improves the quality of financial information which ultimately supports the efficiency of Indonesia's capital market.

The study also identified several limitations that need to be addressed in future research. First, the use of disclosure indexes as a proxy for green accounting has an inherent weakness in the form of potential voluntary disclosure bias, where companies tend to only disclose favorable information (impression management). Future research could integrate independent environmental audits or actual emissions data as more objective proxies. Second, with a sample of 18 companies over 5 years, the generalization of findings to the entire Indonesian mining sector needs to be done carefully. Expanding the sample to other sectors with significant environmental impacts, such as forestry and plantations, can improve the generalizability of the findings. Third, this study did not explore the moderation or mediation mechanisms that might affect the GA–profit persistence relationship, such as the quality of corporate governance, institutional ownership, or the intensity of regulator oversight. Testing the mediation-moderation model in follow-up research will provide a deeper understanding of the boundary conditions of the relationship found. Fourth, the use of autoregressive coefficients as a proxy for profit persistence, although prevalent in the literature, has limitations in capturing the non-linear dynamics of profit persistence that may occur in mining companies under extreme commodity cycle conditions. Alternative methods such as threshold models or regime-switching can be considered for future research to produce a more comprehensive understanding of profit persistence in Indonesia's mining sector.

CONCLUSION

This study has succeeded in empirically proving that green accounting proxied through the Environmental Disclosure Index (EDI) has a significant effect on the integrity of financial

information of mining companies on the Indonesia Stock Exchange for the period 2021–2025. Using the Fixed Effects Model on 90 firm-year observations from 18 sample companies, the test results showed that a higher level of environmental disclosure had a positive and significant effect on profit persistence, indicating that green accounting practices are able to improve the stability and predictability of financial performance. These findings enrich the sustainability accounting literature by providing robust evidence of causality in the context of emerging market capital, while confirming the relevance of legitimacy theory and signal theory in explaining the relationship between environmental disclosure and profit quality.

Regulators such as the OJK and IDX are advised to strengthen mandatory sustainability reporting for mining sector issuers to encourage greater transparency and accountability. Institutional investors can integrate ESG scores as a component of information risk assessment in the due diligence process. This study has limitations in the limited scope of the sample for mining companies with the availability of verified ESG data, so generalizations to other sectors need to be done with caution. Further research is recommended to expand sectoral coverage, adopt green accounting measurements based on actual environmental costs, and explore the role of corporate governance moderation in ESG and profit quality.

Conflict of Interest

The authors declare that there is no conflict of interest related to the publication of this article.

Generative AI

The authors declare that no generative artificial intelligence (AI) tools were used in the preparation, writing, analysis, or development of this manuscript.

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