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GREEN ACCOUNTING, ENVIRONMENTAL PERFORMANCE, LEVERAGE, AND FINANCIAL PERFORMANCE IN CONSUMER NON-CYCLICAL COMPANIES

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ABSTRACT

This study aimed to analyze the partial and simultaneous effects of green accounting, environmental performance, and leverage on financial performance in consumer non-cyclical manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2022 to 2025. Using a quantitative approach, the sample was selected through a saturated sampling technique, gathering 132 companies (528 observations of unbalanced panel data). Secondary data were analyzed using panel data regression with the Fixed Effect Model (FEM) in EViews 12. The results showed that, individually, green accounting (t = 4.3015; p = 0.0000) and environmental performance (t = 4.3620; p = 0.0000) had a positive and significant effect on financial performance (ROA). Conversely, leverage (t = -1.2454; p = 0.2136) had no significant effect on financial performance. Together, all three independent variables significantly affected financial performance (F = 17.8795; p = 0.0000), explaining 9.91% of the variation (Adjusted R^2). This study indicated that environmental accounting transparency and compliance with ecological regulations serve as strategic tools to improve corporate profitability.

Keywords: ***Green Accounting, Environmental Performance, Leverage, Financial Performance, Consumer Non-Cyclical***

INTRODUCTION

Due to the growing effects of climate change, environmental awareness has increased dramatically during the past 20 years. Ecological degradation and greenhouse gas emissions have increased dramatically as a result of mass manufacturing and the usage of fossil fuels in industrial processes. According to data from the Intergovernmental Panel on Climate Change (IPCC, 2023), manufacturing has been a significant contributor to the 1.3% annual growth in worldwide industrial emissions since 2010. Manufacturing continues to be a key economic pillar in Indonesia,

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accounting for 18.34% of GDP in 2022 and 18.67% in 2023. However, as manufacturing produces the most industrial waste, this growth has detrimental effects on the environment. According to assessments conducted in 2024 by the Ministry of Environment and Forestry (KLHK) using the Company Performance Rating Program in Environmental Management (PROPER), two enterprises obtained black ratings and 645 out of 2,400 examined companies received red ratings, indicating ongoing non-compliance. This emphasizes how ecological accountability has not adequately counterbalanced profit-driven expansion. Disclosure levels have increased after the Indonesia Stock Exchange (IDX) implemented sustainability reporting standards. Sustainability disclosures are still of poor quality, though. Only 296 companies (34.95%) of the 955 listed companies in 2024 specifically accepted the Global Reporting Initiative (GRI) requirements in their sustainability reports, suggesting that environmental disclosure processes still need to be improved (Hasan et al., 2026). Green accounting, which integrates economic, social, and environmental aspects under the Triple Bottom Line (TBL) paradigm, has evolved as an integrated reporting system to address these issues.

Corporate environmental performance, as officially measured by PROPER, is an important measure of ecological responsibility that goes beyond green accounting. Additionally, a company's capital structure and financial risk are reflected in leverage, which is represented by the Debt to Equity Ratio (DER). Fixed interest commitments brought forth by unchecked debt use can strain profitability and undermine financial stability. The primary driving force for this study is the empirical discrepancies discovered in earlier studies looking at green accounting, environmental performance, debt, and financial success (Return on Assets). Prior literature presents conflicting evidence some studies identified positive relationships between green accounting or environmental performance and profitability (Dianty & Nurrahim, 2022) (Damayanti & Astuti, 2022), whereas others reported insignificant or even negative effects due to high implementation costs and voluntary disclosure gaps (Angelina & Nursasi, 2021)(Dewi & Muslim, 2022) (Bellamy et al., 2023). This idea is supported by (Rama & Winedar, 2021) demonstration that leverage has a beneficial impact on energy sector firms' earnings management techniques, indicating that capital structure choices can significantly influence corporate financial results and reporting methods. Similarly, the impact of leverage on financial performance remains disputed (Anandamaya & Hermanto, 2021)(Risna & Putra, 2021).

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This study is innovative because it uses imbalanced panel data from consumer non-cyclical enterprises in the post-pandemic period (2022–2025) to examine the combined impacts of Green Accounting, Environmental Performance, and Leverage. Due to mandated sustainability reporting regulations, corporate focus on sustainability has increased in this era. Additionally, in order to give current and thorough empirical evidence, this study uses an imbalanced panel data regression method with the Fixed Effect Model (FEM) across 132 companies. Thus, the purpose of this study was to examine the partial and concurrent effects on financial performance of green accounting, environmental performance, and leverage.

LITERATURE REVIEW

Variables/theories used

1. Stakeholder theory by Freeman (1984)

Believes that instead of concentrating only on maximizing shareholder wealth, a company should provide long-term benefit for all stakeholders, including investors, regulators, local communities, and environmental campaigners. Stakeholders assess a company's operational legitimacy using both financial and non-financial indicators in corporate environmental governance. By using green accounting and openly reporting environmental expenses, the company can demonstrate to stakeholders that it is meeting its social and ecological obligations. Consequently, widespread stakeholder support promotes improved financial performance, lessens operational disagreement, and improves a company's brand. (Freeman & Phillips, 2002).

2. Legitimacy theory by Dowling and Pfeffer (1975)

Operates under the idea that society and business have a "social contract." To keep its operating license, a business must make sure that its operations are in line with current legal requirements, society standards, and values. The Ministry of Environment and Forestry (KLHK) of Indonesia uses the Company Performance Rating Program in Environmental Management (PROPER) to formally assess environmental management compliance. Reaching high PROPER ratings strengthens market trust, verifies business legitimacy, and shields the company from boycotts or regulatory penalties—all of which eventually have a favorable effect on profitability. (Dowling & Pfeffer, 1975).

3. Triple Bottom Line (TBL) by Elkington

Extends the conventional paradigm of financial evaluation to include the three interrelated pillars of profit, people, and planet. This study looks at the relationship between the Profit dimension (measured by Return on Assets) and the Planet dimension (expressed by green accounting transparency and PROPER environmental performance). Investing in environmentally friendly operating procedures reduces waste, decreases environmental risk, and produces long-term cost savings that improve the financial performance of the company. (Slaper & Hall, 2011).

Table 1 Research Variables

Variable	Measurement
Financial Performance	Net income after tax / total assets (ROA)
Green Accounting	Dummy (1= disclosed, 0= not disclosed)
Enviromental Performance	Dummy (1= disclosed, 0= not disclosed)
Leverage	DER

Research Model The study's conceptual framework shows how Green Accounting (X1), Environmental Performance (X2), Leverage (X3), and Financial Performance (Y) are directly, partially, and simultaneously related.

RESEARCH HYPOTHESIS (if any)

Based on the theoretical foundations and empirical literature gap, the research hypotheses are formulated as follows:

H_1 : Green accounting, environmental performance, and leverage simultaneously have a significant effect on the financial performance of consumer non-cyclical manufacturing companies listed on the IDX.

H_2 : Green accounting has a significant positive effect on financial performance.

H_3 : Environmental performance has a significant positive effect on financial performance.

H_4: Leverage has a significant effect on financial performance.

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RESEARCH METHODS

This study adopted a quantitative approach with a causal associative design to analyze the partial and simultaneous effects of green accounting, environmental performance, and leverage on corporate financial performance. The study utilized historical secondary data covering a four-year observation period from 2022 to 2025.

The research target consisted of manufacturing firms in the Consumer Non-Cyclical subsector listed on the Indonesia Stock Exchange (IDX). Using a saturated sampling technique, all 132 companies within the population were selected as the sample. Across the four-year observation window, an unbalanced panel data structure was obtained, yielding a total of 528 valid observations after accounting for data availability.

Secondary data were gathered using documentation and library research techniques. Financial data specifically Return on Assets (ROA) and Debt to Equity Ratio (DER) were extracted from audited annual reports and sustainability reports published on the official IDX website (www.idx.co.id) or company websites. Environmental performance ratings were obtained from official public disclosures issued by the Ministry of Environment and Forestry (KLHK).

Return on Assets (ROA), which is calculated by dividing net profit after taxes by total assets, was used to analyze financial performance (Y). In contrast, green accounting (X1) was assessed using content analysis using a dummy variable (1 = reported environmental costs, 0 = non-disclosure). A dummy variable (1 = revealed their PROPER ratings, 0 = non-disclosure) was used to measure environmental performance (X2), and the Debt to Equity Ratio (DER) served as a proxy for leverage (X3). Panel data regression was used in EViews 12 to process the data, including descriptive statistics, model selection tests (Chow and Hausman tests), diagnostic classical assumption tests (multicollinearity and heteroscedasticity), and hypothesis testing using partial t-tests, simultaneous F-tests, and the Adjusted R2 at a significance level of alpha = 0.05.

RESULTS OF RESEARCH AND DISCUSSION

Panel Data Model Selection

This section presents the empirical findings derived from data processing using EViews 12 to evaluate the impact of green accounting, environmental performance, and leverage on corporate financial performance. The research evaluated a final sample of consumer non-cyclical manufacturing firms listed on the Indonesia Stock Exchange (IDX), generating a total of 528 unbalanced panel data observations over the 2022–2025 period. The analysis encompasses model estimation selection, classical diagnostic assumption tests, hypothesis testing via panel regression, and an in-depth discussion contextualised within the theoretical frameworks.

Panel Data Model Selection Determining the optimal estimation model between the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) involved a series of statistical selection tests.

Table 2 Chow Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.820302	(115,342)	0.0000
Cross-section Chi-square	499.823346	115	0.0000

Source : Data processed by Eviews 12

The Chow test resulted in a cross-section F probability of 0.0000 ($p < 0.05$), rejecting H_0 in favour of FEM. Subsequently, the Hausman test produced a cross-section random probability of 0.0001 ($p < 0.05$), confirming that the Fixed Effect Model (FEM) provided the most consistent and efficient estimates (Basuki, 2021).

Table 3 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	*22.075716*	*3*	0.0001

Source : Data processed by Eviews 12

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In panel data econometrics, when FEM is selected, classical assumption testing focuses primarily on diagnostic checks for multicollinearity and heteroscedasticity. Correlation analysis revealed that correlation coefficients between all independent variables (X_1, X_2, X_3) were well below the 0.85 threshold (maximum correlation r = 0.2774), establishing the absence of multicollinearity. Residual scatterplot visualisations further verified homoscedasticity, as residual data points were randomly dispersed around zero without forming systematic patterns.

Diagnostic Tests (Classical Assumption Tests)

Prior to model estimation, diagnostic tests were conducted to ensure the regression model satisfied linear econometric properties. As the dataset utilizes a panel data structure, diagnostic evaluations focused primarily on tests for multicollinearity and heteroscedasticity. In theory, meeting the Best Linear Unbiased Estimator (BLUE) requirements does not always require normality testing. As a result, this regression model does not require a normality test (Basuki, 2021). The multicollinearity test was executed by analyzing the correlation coefficients across all independent variables (X1, X2, X3).

Table 4 Multikolinearity Test

	X1	X2	X3
X1	1	0.27740	0.088470
X2	0.277440	1	-0.051627
X3	0.088470	-0.051627	1

Source : Data processed by Eviews 12

As presented in Table 1, all pairwise correlation values remained well below the 0.85 critical threshold, with the highest correlation observed between Green Accounting (X1) and Environmental Performance (X2) at 0.2774. Consequently, the model is confirmed to be free from multicollinearity issues.

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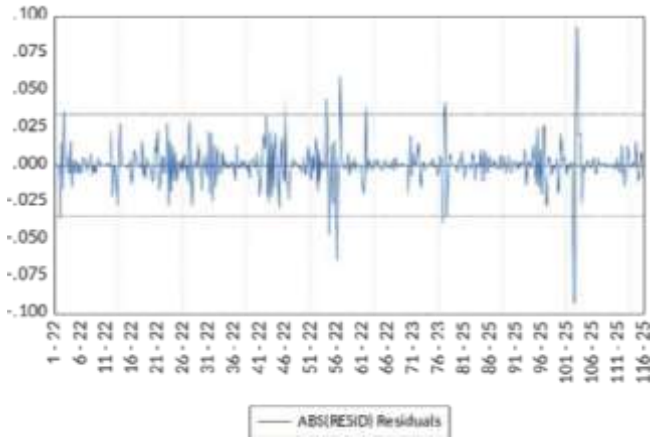

Figure 1 Heteroskedasticity Test

Source : Data processed by Eviews 12

For heteroscedasticity evaluation, residual scatterplot analysis revealed that residual points were randomly distributed around zero without exhibiting any systematic patterns (such as expanding or contracting waves). This confirms that the residual variance is constant, fulfilling the homoscedasticity assumption.

Panel Data Regression Equation

$Y = -0{,}002872 + 0{,}045178X_1 + 0{,}046314X_2 - 0{,}002208*X_3$

The constant value of -0.002872 indicates that, when all independent variables are assumed to be zero, the estimated value of ROA is -0.002872. A one-unit increase in Green Accounting (X1) increases ROA by 0.045178. Similarly, a one-unit increase in Environmental Performance (X2) increases ROA by 0.046314. Conversely, a one-unit increase in Leverage (X3) decreases ROA by 0.002208, assuming other variables remain constant.

Hipotesis Test

Table 5 t-Test

Dependent Variable: Y
Method: Panel Least Squares
Date: 07/14/26 Time: 06:35
Sample: 2022 2025
Periods included: 4
Cross-sections included: 132
Total panel (unbalanced) observations: 528

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002872	0.008003	-0.358911	0.7198
X1	0.045178	0.010503	4.301531	0.0000
X2	0.046314	0.010618	4.362033	0.0000
X3	-0.002208	0.001773	-1.245409	0.2136

Green Accounting (t = 4.3015; p = 0.0000) and PROPER (t = 4.3620; p = 0.0000) had a statistically significant positive effect on the ROA of manufacturing enterprises in the Non-Cyclical Consumer subsector, according to the t- test results. On the other hand, ROA is not significantly impacted by DER (t = -1.2454; p = 0.2136).

Table 6 F Test

R-squared	0.105042
Adjusted R-squared	0.099167
S.E. of regression	0.107687
Sum squared resid	5.299624
Log likelihood	375.2275
F-statistic	17.87958
Prob(F-statistic)	0.000000

Since the F-statistic value is 0.000000 and the F count is 17.87958 > F table is 2.621882598, H0 is rejected and Ha is approved, indicating that Green Accounting, Environmental Disclosure, and Leverage (DER) factors have an impact on the ROA of Indonesian manufacturing enterprises in the Consumer Non Cyclicals Sub-sector.

Table 7 R^2 Test

R-squared	0.105042
Adjusted R-squared	0.099167
S.E. of regression	0.107687
Sum squared resid	5.299624
Log likelihood	375.2275
F-statistic	17.87958
Prob(F-statistic)	0.000000

R Square adjusted to 0.099167, or 9.9167%. The determination's coefficient value, which is 9.9167%, indicates that the independent variable made up of Green Accounting, PROPER, and DER can explain the variable Roa Manufacturing Company Sub-Sector Consumer Non Cyclicals in Indonesia. The remaining 90.0833% describes other variables not included in this research model.

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CONCLUSIONS AND ADVICE

This study empirically examines the impact of Green Accounting, Environmental Performance (measured by PROPER), and Leverage (measured by Debt to Equity Ratio / DER) on Financial Performance (Return on Assets / ROA) among Consumer Non-Cyclical manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2022–2025 period. Based on the statistical testing using the Fixed Effect Model (FEM) data panel regression, the conclusions are drawn as follows:

1. Partial Effect of Green Accounting on Financial Performance: Green Accounting has a positive and significant effect on Return on Assets (ROA) ($t = 4.301531$, $p = 0.0000 < 0.05$). This finding indicates that environmental cost disclosure in annual or sustainability reports enhances corporate transparency, gains stakeholder trust, and reinforces corporate legitimacy, which ultimately translates into improved financial performance.
2. Partial Effect of Environmental Performance on Financial Performance: Environmental Performance (PROPER) has a positive and significant effect on Return on Assets (ROA) ($t = 4.362033$, $p = 0.0000 < 0.05$). This demonstrates that compliance and superior environmental management incentivize consumers and investors, reduce operational and regulatory risks, and enhance corporate profitability.
3. Partial Effect of Leverage on Financial Performance: Leverage (DER) does not have a significant effect on Return on Assets (ROA) ($t = -1.245409$, $p = 0.2136 > 0.05$). This implies that variations in capital structure and debt dependency do not directly determine profitability level in Consumer Non-Cyclical companies during the observed period. This finding deviates

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from that of (Mansur & Sari, 2025), who discovered that among real estate companies registered on the Indonesia Stock Exchange, leverage has a considerable impact on financial performance and that financial performance mediates its effect on firm value (Mansur & Sari, 2025).

4. Simultaneous Effect: Simultaneously, Green Accounting, Environmental Performance, and Leverage significantly influence Financial Performance ($F = 17.87958$, $p = 0.000000 < 0.05$). The adjusted R^2 value of 0.099167 indicates that 9.92% of the variation in ROA is explained by the combination of Green Accounting, PROPER rating, and DER, while the remaining 90.08 % is determined by other factors not included in the empirical model.

Practical Advice for Corporate Management:

1. Manufacturing companies, particularly within the Consumer Non-Cyclical sector, are encouraged to actively implement and disclose green accounting mechanisms and improve their PROPER ratings beyond basic compliance. Environmental initiatives should not be viewed merely as expenses, but as strategic long-term investments that strengthen corporate reputation and financial sustainability.
2. Advice for Regulators and Policy Makers: Regulators, such as the Indonesia Stock Exchange (BEI) and the Ministry of Environment and Forestry (KLHK), should continue strengthening standard reporting guidelines for environmental cost accounting and sustainability disclosure to ensure uniformity and transparency across listed companies.
3. Recommendations for Future Research:Future researchers are advised to:Expand the research scope by incorporating other financial ratios or additional non-financial variables (e.g., Good Corporate Governance, Firm Size, or Carbon Emission Disclosure) to increase the explanatory power (R^2) of the model. Extend the observation period or analyze other high-polluting sectors (such as mining or chemical sub-sectors) to evaluate whether these empirical findings hold true across diverse industrial contexts.

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