

Environmental Performance and Material Flow Cost Accounting in Food and Beverage Manufacturing Companies

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ABSTRACT

Purpose: The research investigates whether environmental performance and MFCA and their impact on the financial results of food and beverage production firms registered on the Indonesia Stock Exchange (IDX) during the years 2020 to 2024.

Design/Methodology/Approach: A quantitative approach was adopted in this study, utilizing secondary data obtained from annual reports, sustainability reports, and PROPER records. Through purposive sampling, the study comprised 40 observations. The data were subsequently analyzed using multiple linear regression with the assistance of SPSS version 26.

Findings: The findings indicate that environmental performance has a significant effect on financial performance, while MFCA does not demonstrate a significant partial effect. Nevertheless, when evaluated jointly, environmental performance and MFCA exert a significant influence on financial performance.

Research Implications: From a theoretical perspective, the findings reinforce the applicability of Legitimacy Theory in describing the association between corporate environmental performance and Financial Performance. In contrast, the absence of a significant effect of MFCA suggests that operational efficiency and environmental management accounting may require consideration from a broader theoretical perspective. In practical terms, companies are encouraged to enhance their environmental management practices while improving the efficiency of resource utilization to support Financial Performance. Furthermore, the findings emphasize the need for more comprehensive MFCA measurements to evaluate the financial consequences of material losses and inefficient resource utilization.

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INTRODUCTION

The increasing emphasis on sustainable business practices has shifted corporate objectives beyond profit maximization toward balancing economic, social, and environmental responsibilities. Widyawati et al. (2025) emphasized that corporate success extends beyond financial performance, encompassing the company's capacity to integrate sustainability principles into its operations. This viewpoint aligns with the Triple Bottom Line idea, emphasizing the need to ensure financial success while also taking into account societal well-being and environmental conservation (Lumi et al., 2023). Similarly, legitimacy theory posits that companies need to align their activities with societal expectations in order to maintain public trust and ensure long-term business sustainability (Nilawati & Arizah, 2025).

Environmental responsibility has become particularly relevant for manufacturing companies because their production processes require substantial natural resources and generate waste that may threaten environmental quality if not properly managed (Bartolome & Khairin, 2025). In the manufacturing industry, the food and beverage sector is important for Indonesia's economy. Statistics Indonesia (2024) reports that the food and beverage manufacturing sub-sector plays a significant role in Indonesia's manufacturing sector and is

characterized by intensive use of raw materials and energy, as well as substantial production waste (Badan Pusat Statistik, 2024). This sector uses a lot of raw materials and energy, which can lead to more waste and environmental pollution. (Rosmida et al., 2024). At the same time, inefficient utilization of these resources can increase production costs and adversely affect financial performance (Putri et al., 2024).

To improve how companies are responsible for the environment, the Indonesian government started the Corporate Environmental Performance Rating Program, called PROPER, as stated in the Minister of Environment and Forestry Regulation Number 1 of 2021. PROPER looks at how well companies handle their environmental practices and how serious they are about developing in a sustainable way (Widyawati et al., 2025). For publicly listed companies, favorable PROPER ratings may improve corporate reputation and increase stakeholder confidence, whereas poor ratings can negatively affect public perception and company performance (Siregar et al., 2022). A high PROPER rating also indicates that a company faces lower operational risk and is managed by a competent management team committed to effective environmental governance. On the other hand, a low PROPER score can lead to a bad image in the market and might reduce the company's worth, because it shows that the company is not doing enough to meet environmental standards that people and stakeholders expect (Reyhan et al., 2024).

Although environmental performance reflects compliance with environmental standards, it does not necessarily indicate efficient resource utilization. So, Material Flow Cost Accounting (MFCA) was introduced as a way to help manage the environment by tracking how materials move through a process, how much energy is used, and where waste is produced. This helps improve how efficiently resources are used and reduces the amount of raw materials that are lost (Widyawati et al., 2025). Effective MFCA implementation is expected to enhance cost efficiency and support better organizational performance (Dewi, 2025).

Studies so far have given different results about how Environmental Performance and MFCA affect Financial Performance. Research shows that when companies take better care of the environment, they also do better financially. This means that businesses that are more responsible in their environmental actions usually get more support from the people and groups that care about them (Sinosi et al., 2022; Suandi & Ruchjana, 2021). Conversely, other studies found no significant relationship, arguing that environmental management costs may not immediately generate financial benefits (Bartolome & Khairin, 2025). Similar inconsistencies were also identified in MFCA research. Depi & Utami (2025) concluded that MFCA improves cost efficiency and corporate performance, whereas Oktadifa & Widajantie (2024) reported no significant impact on profitability.

Studies show mixed results, which means the link between how well a company protects the environment, its use of material flow cost accounting, and its financial success is still not completely clear. In particular, further evidence is needed to understand whether environmental performance and resource-use efficiency provide complementary explanations of corporate Financial Performance when examined within the same empirical framework. This study addresses this gap by examining Environmental Performance and MFCA simultaneously as two complementary dimensions of environmental management and resource-use efficiency in explaining Financial Performance. This study brings together these two areas into one clear framework, offering a complete view of how managing the environment and using resources efficiently connect to the financial success of companies in Indonesia's food and beverage manufacturing industry. So, this study looks at how environmental performance and Material Flow Cost Accounting, each on their own and together, affect the financial results of food and beverage companies that are listed on the Indonesia Stock Exchange (IDX) between the years 2020 and 2024. This study contributes to the body of knowledge by presenting an integrated empirical assessment of environmental performance and resource-use efficiency as

determinants of corporate financial performance in Indonesia's food and beverage manufacturing sector.

LITERATURE REVIEW

Legitimacy Theory

According to Legitimacy theory, as introduced by Dowling & Pfeffer (1975), companies strive to maintain legitimacy by aligning their operational activities with prevailing societal norms and expectations, thereby supporting the long-term continuity of their business operations (Subroto & Endaryati, 2023). Harahap & Marpaung (2023) say that legitimacy is when the public accepts a company's actions. Because of this, companies need to take into account social and environmental issues in all the policies they create. According to the social contract view, businesses should make sure their actions match the needs and interests of society so they can stay trusted and accepted by the public, as stated (Titani & Susilowati, 2022). Failure to meet these expectations may create a legitimacy gap that can undermine stakeholder trust (Pratama & Deviyanti, 2022). In this study, Legitimacy Theory is used to explain how companies carry out environmental performance and apply MFCA as a way to show their responsibility towards the environment. This is expected to build more trust among stakeholders and improve the company's financial results (Suandi & Ruchjana, 2021).

The Effect of Environmental Performance on Financial Performance

According to Legitimacy Theory, when a company has strong environmental performance, it can boost its legitimacy and build more trust with the public and investors. This trust can then help improve the company's financial results. Empirical evidence from (Sinosi et al., 2022), (Suandi & Ruchjana, 2021), and (Wulandari et al., 2022) found that Environmental Performance influences Financial Performance. However, (Anggraini et al., 2024) and (Bartolome & Khairin, 2025) reported different findings. Based on these findings, the following hypothesis is proposed.

H1: Environmental Performance affects Financial Performance

The Effect of Material Flow Cost Accounting (MFCA) on Financial Performance

Material Flow Cost Accounting (MFCA) helps companies use materials more efficiently and reduce unnecessary costs, which can lead to better financial results. The findings of (Amrulloh & Sandari, 2025), (Rosmida et al., 2024), and (Wulandari et al., 2022) found that Material Flow Cost Accounting (MFCA) affects Financial Performance, whereas (Asti, 2021) and (Afni & Achyani, 2023) reported different findings. Therefore, the study formulates the following hypothesis.

H2: Material Flow Cost Accounting (MFCA) affects Financial Performance

The Effect of Environmental Performance and Material Flow Cost Accounting (MFCA) on Financial Performance

Environmental Performance and MFCA represent corporate efforts to fulfill environmental responsibilities while improving the efficiency of resource utilization. The combination of these two factors is expected to strengthen corporate legitimacy and support improvements in Financial Performance (Bartolome & Khairin, 2025) and (Rosmida et al., 2024). Accordingly, the following hypothesis is proposed:

H3: Environmental Performance and Material Flow Cost Accounting (MFCA) affect Financial Performance

METHODS

The research was designed within a quantitative framework to look at how Environmental Performance and MFCA affect Financial Performance (Syahroni, 2022). Secondary data were obtained through a literature review and web-based documentation, including annual reports, sustainability reports, and PROPER (Sulung & Muspawi, 2024). The first group had 132 companies from the Non-Cyclical Consumer Goods industry that were listed on the Indonesia Stock Exchange (BEI) between 2020 and 2024. From this population, companies operating in the food and beverage manufacturing subsector were identified as the target population. Purposive sampling was then applied based on the predetermined sampling criteria, resulting in eight eligible food and beverage manufacturing companies. With five years of observations for each company, the empirical analysis is based on a total of 40 firm-year observations. Financial Performance was assessed using ROA, determined by dividing net income after tax and dividing it by total assets at the end of the fiscal year. Environmental Performance was assessed based on PROPER ratings, ranging from Black (1) to Gold (5). Meanwhile, Material Flow Cost Accounting (MFCA) was operationalized using production cost as a proxy for its cost dimension, comprising material costs, manufacturing overhead costs, and direct labor costs. This proxy was selected because the required financial information was available in the companies' annual reports and could represent the cost dimension of production activities. However, production cost does not fully represent the MFCA framework, which more comprehensively considers material flows, material losses, energy use, and waste generation. Therefore, the measure used in this study should be interpreted as a proxy for the cost dimension of MFCA rather than as a comprehensive measure of MFCA implementation. The operational definitions of the variables studied in this research are listed in Table 1:

Table 1. The operational definitions

No	Variable	Measurement Scale	Description	Reference
1	Financial Performance	Ratio	Return on Assets (ROA): $ROA = \frac{\text{Net Income After Tax}}{\text{Total Assets}} \times 100\%$	(Widyawati et al., 2025)
2	Environmental Performance	Ordinal	Proper Rating Score: Gold (5), Green (4), Blue (3), Red (2), dan Black (1)	(Suandi & Ruchjana, 2021)
3	Material Flow Cost Accounting (MFCA)	Ratio	Production Cost = Material Cost + Manufacturing Overhead Cost + Direct Labor Cost	(Rosmida et al., 2024)

Source: Prepared by the Author (2026)

Data analysis was done using IBM SPSS Statistics 26. The analysis started with descriptive statistics and then moved on to classical assumption tests, which checked for normality, multicollinearity, heteroscedasticity, and autocorrelation. The hypothesis is checked using multiple linear regression analysis. The model's performance is evaluated based on the coefficient of determination (R^2), a t-test to check the significance of each variable, and an F-test to check the significance of the model as a whole.

RESULT

Descriptive Statistics

Descriptive statistics give a basic summary of the main features and how the data is spread out in a study (Martias, 2021). Each research variable was characterized by its minimum, maximum, mean, and spread of values. Table 2 shows the results from the descriptive statistical analysis:

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Financial Performance	40	0.00	12.00	1.9805	3.62798
Environmental Performance	40	3.00	5.00	3.2000	0.51640
MFCA	40	317517.00	45704099.00	8390782.2250	12746949.25920
Valid N (listwise)	40				

Source: Data processed with IBM SPSS 26, 2026

The table shows that this study uses data from 40 firm-year observations collected from eight food and beverage manufacturing companies that are listed on the IDX between the years 2020 and 2024. Financial Performance, as measured by ROA, ranges from 0.00 to 12.00, with a mean of 1.9805 and a spread of values of 3.62798, indicating considerable variation in asset-based profitability across the sampled firms and observation years. Environmental Performance ranges from 3 to 5, with a mean of 3.2000 and a spread of values of 0.51640. The relatively limited range suggests low variability in Environmental Performance, with observations concentrated in the Blue, Green, and Gold PROPER categories. Such limited variation may constrain the extent to which differences in Environmental Performance can be distinguished across firms and observation years.

MFCA, operationalized as production cost, shows substantial dispersion, ranging from 317,517.00 to 45,704,099.00, with a mean of 8,390,782.2250 and a standard deviation of 12,746,949.25920. The standard deviation exceeding the mean indicates considerable heterogeneity in production cost among the sampled firms. This variation may reflect differences in company scale and production cost structures and may also indicate the presence of extreme observations. Therefore, the wide dispersion of the MFCA proxy would be considered when interpreting the subsequent regression results.

Classical Assumption Test

Normality Test

Normality testing is a key statistical method used to check if the data being analyzed follows a normal distribution (Mulyati et al., 2024).

Table 3. Normality Test

	Unstandardized Residual
N	38
Test Statistic	0.092
Asymp. Sig. (2-tailed)	0.200 ^{c,d}

Source: Data processed with IBM SPSS 26, 2026

The difference between the 38 observations used in the normality test and the 40 observations reported in the descriptive and regression analyses is attributable to missing data affecting two observations in the normality test. The normality test results show that the dataset follows a normal distribution, with an Asymp. The significance value is 0.200, which is higher than the 0.05 significance level.

Multicollinearity Test

Multicollinearity refers to a statistical issue in multiple linear regression that arises when two or more independent variables exhibit a high degree of linear correlation, potentially affecting the reliability of the estimated regression coefficients (Zulkifli et al., 2025). The check for multicollinearity shows that all independent variables have a tolerance value above 0.10

and a Variance Inflation Factor (VIF) below 10, which means the assumption about multicollinearity is satisfied (Sahir, 2022).

Table 4. Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
1	Environmental Performance	0.987
	MFCA	1.013

Source: Data processed with IBM SPSS 26, 2026

These findings show the explanatory variables are sufficiently independent of one another, which means all the explanatory variables can be used together to be examined simultaneously without affecting the accuracy of the coefficient estimates.

Heteroscedasticity Test

Heteroscedasticity represents a violation of the regression assumption in which the variance of the error terms varies across different levels of the independent variables (Firdausya & Indawati, 2023).

Table 5. Heteroscedasticity Test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	-1.566	2.231	-0.702	0.487
	Environmental Performance	-0.138	0.693	-0.199	0.843
	MFCA	3.721E-9	0.000	0.132	0.896

Source: Data processed with IBM SPSS 26, 2026

The Park test for heteroscedasticity showed that all the independent variables had p-values higher than 0.05, suggesting no evidence of heteroscedasticity and confirming that the residual variance remained constant.

Autocorrelation Test

Autocorrelation, which is also called serial correlation, refers to a condition in linear regression analysis where the residuals are correlated with one another rather than being statistically independent (Cahyani & Muljaningsih, 2022).

Table 6. Runs Test

Unstandardized Residual	
Test Value ^a	-1.23566
Cases < Test Value	20
Cases >= Test Value	20
Total Cases	40
Number of Runs	16
Z	-1.442
Asymp. Sig. (2-tailed)	0.149
a. Median	

Source: Data processed with IBM SPSS 26, 2026

The Runs Test for autocorrelation had a significance value of 0.149, which is greater than 0.05. This means there was no autocorrelation found in the residuals.

Multiple Linear Regression Analysis

The estimated constant is -0.653 . However, because a value of zero for Environmental Performance is outside the observed PROPER range and a zero value for the MFCA proxy is not meaningful within the context of the sampled firms, the intercept does not have a substantive economic interpretation in this study.

Table 7. Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.653	0.715		-0.914	0.367
	Environmental Performance	1.026	0.055	0.970	18.739	0.000
	MFCA	-7.751E-8	4.863E-8	-0.083	-1.594	0.119

Source: Data processed with IBM SPSS 26, 2026

The multiple linear regression results yield the following regression equation:

$$Y = -0.653 + 1.026X_1 - 7.751 \times 10^{-8}X_2 + e$$

Environmental Performance is associated with a regression coefficient (X_1) of 1.026, which means that when Environmental Performance increases by one unit, Financial Performance also tends to increase by 1.026 units, after taking into account other factors. The standardized coefficient ($\beta = 0.970$) indicates a strong standardized association within the pooled regression model, given the relatively limited variation in Environmental Performance (PROPER scores ranging from 3 to 5). The regression coefficient for the MFCA proxy (X_2) is -7.751×10^{-8} , indicating that a one-unit increase in the monetary value of the MFCA proxy is associated with a 7.751×10^{-8} -unit decrease in Financial Performance, holding the other variable constant.

Hypothesis Testing

Coefficient of Determination (R^2)

Table 8. Coefficient of Determination (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.952 ^a	0.907	0.902	3.74354

Source: Data processed with IBM SPSS 26, 2026

The Adjusted R-squared value of 0.902 shows that Environmental Performance and MFCA together explain 90.2% of the changes in Financial Performance. The remaining 9.8% is due to other reasons that weren't part of the research model. This result indicates high explanatory power under the pooled regression specification. However, because the 40 observations consist of repeated observations from eight firms over five years, the relatively high explanatory power may partly reflect persistent firm-specific characteristics captured by the pooled model. Therefore, the adjusted R^2 should be interpreted cautiously and not as definitive evidence that the two predictors explain 90.2% of Financial Performance across firms in general.

Partial Test (t-test)

Table 9. Partial Test (t-test)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.653	0.715		-0.914	0.367
	Environmental Performance	1.026	0.055	0.970	18.739	0.000
	MFCA	-7.751E-8	4.863E-8	-0.083	-1.594	0.119

Source: Data processed with IBM SPSS 26, 2026

Partial significance test, which is a t-test, indicates that Environmental Performance (X_1) has a p-value of 0.000. Because this value is under the 0.05 significance level, there is a statistically significant positive connection between Environmental Performance and Financial Performance. Therefore, H_1 was supported. The findings indicate that better Environmental Performance is associated with an increase in Financial Performance. However, given the

repeated firm-year structure of the observations, the magnitude of the coefficient and its statistical significance should be interpreted cautiously because persistent firm-specific characteristics may contribute to the observed relationship.

In contrast, MFCA (X_2) had a p-value of 0.119, which is higher than the 0.05 level of significance, meaning that MFCA does not have a statistically significant impact on Financial Performance. Therefore, H_2 was not supported.

Simultaneous Test (F-test)

Table 10. Simultaneous Test (F-test)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5070.192	2	2535.096	180.896	0.000 ^b
	Residual	518.523	37	14.014		
	Total	5588.715	39			

Source: Data processed with IBM SPSS 26, 2026

F-test yielded an F-value of 180.896 and a significance level of 0.000. Because the significance value is less than 0.05, both Environmental Performance (X_1) and MFCA (X_2) have a strong, statistically significant effect on Financial Performance (Y). The findings show that the regression model is statistically significant and works well for predicting financial performance.

DISCUSSION

The partial t-test results demonstrate that Environmental Performance has a strong, positive impact on financial performance, and this impact is statistically significant. The positive regression coefficient further demonstrates that improvements in Environmental Performance are associated with higher Financial Performance. Accordingly, H_1 was supported, demonstrating that Environmental Performance significantly affects the Financial Performance of food and beverage manufacturing companies listed on the IDX over the 2020–2024 period. estimation results also yielded a relatively high adjusted R^2 of 0.902, while Environmental Performance produced a t-value of 18.739. Although these results indicate a strong statistical association under the pooled regression specification, their magnitude should be interpreted cautiously. The 40 firm-year observations consist of eight firms observed repeatedly over five years, meaning that persistent firm-specific characteristics may contribute to each company might be influencing the link between Environmental Performance and Financial Performance. Accordingly, the high explanatory power and statistical significance should not be interpreted as definitive evidence of a causal relationship, but rather as evidence of a strong association within the observed sample and pooled regression specification.

Within the observed sample, the findings suggest that companies achieving higher PROPER ratings tend to exhibit greater profitability, based on their ROA measurements. Bartolome & Khairin (2025) explain that a high PROPER rating indicates effective environmental management, as reflected in pollution prevention, waste management, energy efficiency, and compliance with environmental regulations. This evidence further supports legitimacy theory, which suggests that organizations establish social legitimacy by aligning their operational practices with prevailing societal values and stakeholder expectations (Rosmida et al., 2024). As a result, superior Environmental Performance strengthens stakeholder confidence, enhances corporate reputation, and ultimately contributes to improved Financial Performance.

These results of this study corroborate those of prior research by Suandi & Ruchjana (2021), Sinosi et al. (2022), and Wulandari et al. (2022). The previous studies consistently identified a positive and significant relationship between Environmental Performance and Financial Performance. In contrast, the results differ from those reported by Ananda &

Hendrawaty (2025) and Nurfadila et al. (2026), who found no significant association between the two variables. Such inconsistencies may arise from the substantial costs associated with environmental management, which can temporarily reduce corporate profitability despite improvements in environmental performance.

The partial t-test results indicate that MFCA has no statistically significant effect on Financial Performance. Accordingly, H_2 was rejected, indicating that MFCA has no significant influence on the Financial Performance of food and beverage manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2020 to 2024 period. The absence of a significant relationship suggests that improvements in material-use efficiency, as represented by MFCA, were insufficient to increase corporate profitability, which was evaluated through ROA throughout the observation period. From the perspective of legitimacy theory, companies pursue not only profit maximization but also social legitimacy by demonstrating responsible resource management (Widyawati et al., 2025). Furthermore, Rosmida et al. (2024) argued that the implementation of MFCA is expected to improve material-use efficiency by minimizing production waste and reducing production costs, thereby enhancing Financial Performance. Nevertheless, the empirical evidence obtained in this study suggests that the adoption of MFCA has not yet translated into a significant improvement in ROA.

One possible explanation is that MFCA was proxied by production costs, which may not adequately reflect material-use efficiency. This proxy does not comprehensively capture the flow of materials because it lacks detailed information on raw material utilization, energy consumption, and waste generation throughout the production process (Santoso & Handoko, 2025). These findings are in line with the results reported by Afni & Achyani (2023) and Asti (2021), who likewise discovered no notable impact of MFCA on Financial Performance. However, the present results differ from those of Amrulloh & Sandari (2025) and Rosmida et al. (2024), who concluded that the implementation of MFCA enhances material-use efficiency and subsequently contributes positively to corporate Financial Performance.

Based on the F-test, H_3 received support, suggesting that the multiple linear regression model holds statistical significance. The findings further demonstrate that Environmental Performance (X_1) and MFCA (X_2) jointly have a significant effect on Financial Performance (Y) among food and beverage manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2020-2024 period. Even though partial analysis identified Environmental Performance as the sole variable with a statistically significant individual impact, whereas MFCA showed no significant partial influence, the simultaneous analysis revealed that both variables collectively explain variations in Financial Performance. This suggests that effective environmental management and efficient material utilization complement each other in supporting improved corporate financial outcomes.

The findings align with legitimacy theory, initially introduced by Dowling & Pfeffer (1975), which holds that organizations strive to align their operational activities with prevailing societal values, norms, and stakeholder expectations Widyawati et al. (2025). High Environmental Performance reflects corporate compliance with environmental regulations through effective pollution control, waste management, and responsible resource utilization. At the same time, the implementation of MFCA demonstrates a commitment to improving material-use efficiency and minimizing production waste (Rosmida et al., 2024). Together, these practices can strengthen stakeholder trust and contribute to enhanced Financial Performance.

This research extends the existing literature by jointly examining Environmental Performance and MFCA as determinants of Financial Performance. In contrast to prior research that has predominantly examined these variables separately, this study offers a more comprehensive perspective on their combined influence on corporate Financial Performance.

The findings support earlier evidence reported by Suandi & Ruchjana (2021) and Sinosi et al. (2022) regarding the positive role of environmental performance in improving Financial Performance. However, a different pattern was observed for MFCA. Although MFCA did not exhibit a statistically significant individual effect, its inclusion together with Environmental Performance produced a significant simultaneous effect on Financial Performance. This suggests that the contribution of MFCA to corporate financial outcomes may be more pronounced when supported by strong environmental performance.

CONCLUSION

This study examined the effects of environmental performance and MFCA on the financial performance of food and beverage manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2020-2024 period. The empirical results show that environmental performance has a positive and statistically significant effect on Financial Performance, indicating that firms with higher PROPER ratings tend to achieve greater profitability, as measured by ROA. Conversely, MFCA does not exert a statistically significant effect on financial performance, suggesting that the use of production costs as a proxy for MFCA does not adequately account for variations in corporate profitability over the observation period. The simultaneous analysis demonstrates that environmental performance and MFCA jointly have a significant effect on Financial Performance. This finding highlights the importance of integrating effective environmental management with efficient material-use practices to support improved corporate financial outcomes. Accordingly, companies are encouraged to strengthen their environmental management initiatives while optimizing the implementation of MFCA to enhance resource-use efficiency and promote sustainable financial performance. The study uses pooled multiple linear regression on 40 firm-year observations from eight firms. Because the same firms are observed repeatedly over five years, persistent firm-specific characteristics may not be fully accounted for. Consequently, the magnitude of the model's explanatory power and statistical significance should be interpreted cautiously. Future research should consider employing MFCA measurements that are more closely aligned with ISO 14051, incorporating additional variables that may influence Financial Performance, and applying panel-data methods or other estimation techniques that account for the repeated observations of the same firms over time. These approaches may offer a more comprehensive assessment of the factors influencing corporate Financial Performance while accounting for firm-specific effects that may not be adequately captured through pooled regression.

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