

## The Effect of Environmental Management Accounting and Green Innovation on Financial Performance with Environmental Performance as an Intervening Variable

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**ABSTRACT :** This study aims to examine the influence of environmental management accounting and green innovation on financial performance, with environmental performance as a mediating variable. The sample consists of 13 manufacturing companies listed on the Indonesia Stock Exchange during the period 2021–2023. Data analysis techniques used include descriptive statistics, classical assumption tests, path analysis, hypothesis testing, and mediation significance testing using SPSS version 22. The results show that environmental management accounting has a positive and significant effect on financial performance, while green innovation has no significant effect on financial performance. Furthermore, environmental management accounting does not significantly affect environmental performance, while green innovation has a positive and significant effect on environmental performance. Environmental performance does not significantly affect financial performance and does not mediate the relationship between environmental management accounting and green innovation with financial performance.

**KEYWORDS :** *Environmental management accounting, environmental performance, financial performance, green innovation*

### I. INTRODUCTION

Environmental damage and climate change have become pressing concerns in recent years. In Indonesia, the growth of the manufacturing sector, particularly the diversified industry subsector has led to significant environmental consequences due to high energy usage, chemical materials, and excessive industrial waste. These industries are major contributors to environmental pollution, including air, water, and soil contamination.

For instance, coastal areas in northern Central Java have experienced land subsidence linked to industrial activity, which contributes 34.5% to the provincial economy but also emits large amounts of carbon from power plants (Nurhadi Sucahyo, 2021). The Citarum River is heavily polluted by textile industries, with microplastics mainly polyester fibers accounting for 85% of river waste (Ahmad Arif, 2022). In Bantaeng Regency, PT. Huadi Nickel Alloy Indonesia's direct disposal of waste into the sea and air emissions caused health and environmental problems (Wahyu Chandra, 2023).

These cases indicate that manufacturing operations, if not managed responsibly, can lead to significant environmental degradation. This environmental damage results in financial consequences for companies such as restoration costs, fines, and litigation that ultimately affect profitability and financial performance. Conversely, good environmental management can enhance a company's financial standing and attract investor interest. Therefore, companies need to demonstrate sound financial performance as part of their environmental accountability to stakeholders.

One effective approach to improve both environmental and financial performance is the implementation of Environmental Management Accounting (EMA) and green innovation. EMA provides accurate, relevant, and detailed information on environmental costs both visible and hidden, and supports resource efficiency. It reflects a company's responsibility to address environmental issues and supports long-term sustainability by improving product quality and resource optimization (Agustia et al., 2019; Endiana & Suryandari, 2021).

Green innovation, gaining popularity in recent years, is seen as a solution to environmental challenges such as global warming. It emphasizes eco-friendly technologies and practices that improve resource and energy efficiency, reduce production costs, and ultimately enhance profitability (Miao et al., 2017; Küçükoğlu & Pinar, 2015).

Good environmental performance also strengthens stakeholder trust and has a positive impact on financial outcomes. According to Bennett et al. (2017), environmental performance reflects a company's ability to manage the environmental impact of its operations, including minimizing waste and maximizing resource use. Companies demonstrating responsible environmental management send positive signals to stakeholders, indicating that they are not solely profit-oriented but also socially and environmentally responsible.

Therefore, the integration of EMA and green innovation is not only a strategy to improve environmental and financial performance but also serves as indirect communication with stakeholders. Companies that adopt these practices show commitment to sustainability, which enhances stakeholder confidence and can improve access to investment. Companies must implement EMA and green innovation efficiently to enhance environmental performance, reduce costs, and ultimately improve financial outcomes.

## II. LITERATUR REVIEW AND HYPOTHESIS DEVELOPMENT

### Stakeholder Theory

Stakeholder theory highlights the company's obligation to consider the interests of both internal and external parties involved in or affected by its operations (Freeman & Reed, 1983). As businesses grow, public concern over corporate activities increases, requiring companies to act responsibly not only toward shareholders but also toward all stakeholders. These include primary stakeholders such as investors, employees, and local communities and secondary stakeholders like media and social groups (Ethics, 1999). The implementation of environmental management accounting and green innovation reflects a company's commitment to stakeholders. These practices help prevent environmental damage, build public trust, and ultimately support improved financial performance.

### Signaling Theory

Signaling theory, first introduced by Spence in 1973, explains how companies convey future prospects through specific actions or strategies (Brigham et al., 1999). In essence, signaling serves as an indirect form of communication with stakeholders. Within this study, environmental management accounting and green innovation act as positive signals, indicating a company's commitment to environmental responsibility. These signals help build stakeholder trust and can attract investors by showing that the company is forward-looking and accountable.

### The Influence of Environmental Management Accounting on Financial Performance.

A study by Maysaroh & Murwaningsari (2023) confirmed that environmental management accounting has a significant and positive effect on financial performance. Likewise, Agustia et al. (2019) emphasized the importance of detailed and relevant environmental cost information to support long-term sustainability strategies. These practices allow companies to send positive signals to stakeholders about their environmental responsibility, aligning with both signaling theory and stakeholder theory.

H1: Environmental management accounting has a positive and significant effect on financial performance.

### The Influence of Green Innovation on Financial Performance.

A study by Putri Fabiola & Khusnah (2022) was found to positively and significantly influence financial performance. Green innovation involves adopting environmentally friendly techniques and improving operational systems to reduce environmental impact. These practices support sustainability while maintaining product quality and operational efficiency. In line with stakeholder theory, such efforts signal a company's environmental commitment, while signaling theory suggests that green innovation communicates positive future prospects to stakeholders.

H2: Green innovation has a positive and significant effect on financial performance.

### The Influence of Environmental Management Accounting on Environmental Performance.

A study by Raino Wirjono & Bramanda Deva (2024) Findings supports the view that environmental management accounting contributes positively to improving a firm's environmental performance. By integrating environmental considerations into business decisions, companies can manage resources more efficiently and minimize negative environmental impacts. The more consistently environmental management accounting is implemented, the better a company can manage its operational impact. In line with stakeholder theory, this reflects the company's responsibility toward stakeholders, particularly regulatory bodies. Signaling theory also supports that such practices signal environmental accountability to stakeholders.

H3: Environmental management accounting has a positive and significant effect on environmental performance

### The Influence of Green Innovation on Environmental Performance.

According to Jermstiparsert et al. (2020) found that green innovation plays a crucial role in improving environmental performance. Through the adoption of green innovation, companies communicate their environmental responsibility and commitment to sustainability. In line with stakeholder theory, this practice builds stakeholder's especially from the public and government showing the company's responsiveness to social and environmental demands. According to signaling theory, green innovation also serves as a positive signal of the company's sustainability values and environmental awareness.

H4: Green innovation has a positive and significant effect on environmental performance

### The Influence of Environmental Performance on Financial Performance.

A study by Rizka Annisya Putri Latifah & Nikmah (2024) found that environmental performance has a significant positive effect on financial performance. One way companies fulfill their responsibilities to stakeholders is by demonstrating strong environmental performance. Through environmental reporting, companies signal transparency and a commitment to managing environmental impact. According to stakeholder theory, good environmental performance reflects the company's accountability to stakeholder expectations. In line with signaling theory, it also serves as a positive indicator that can foster trust, loyalty, and long-term support-ultimately contributing to improved profitability and financial stability.

H5: Environmental performance has a positive and significant effect on financial performance.

### The Mediating Role of Environmental Performance in the Relationship between Environmental Management Accounting and Financial Performance.

Environmental performance, in turn, contributes to financial improvement by enhancing trust and reputation. As stated by Henri & Journeault (2010), environmental performance serves as a bridge linking environmental control with financial outcomes. Environmental management accounting is instrumental in aligning environmental and financial performance. In line with signaling theory, improvements in environmental performance send positive signals to stakeholders, boosting corporate image and financial results. H6: Environmental management accounting has an indirect effect on financial performance through environmental performance.

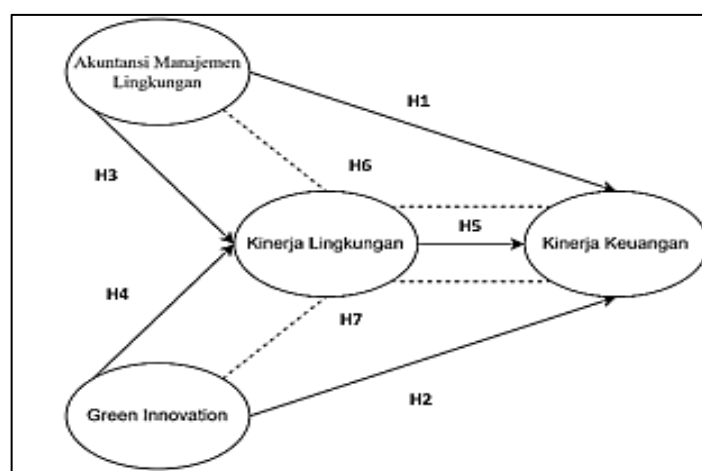
### The Mediating role of Environmental Performance in the relationship between Green Innovation and Financial Performance.

Green innovation enhances environmental performance, reflecting a company's commitment to sustainability and responsibility. According to stakeholder theory, this commitment strengthens trust, loyalty, and investor confidence—key drivers of financial performance. Green innovation also supports eco-conscious decisions without compromising efficiency. In line with signaling theory, improved environmental performance sends a positive signal to stakeholders, boosting corporate image and attracting investment. As supported by Intari & Khusnah (2023), environmental performance mediates the relationship between green innovation and financial outcomes.

H7: Green innovation has an indirect effect on financial performance through environmental performance.

## III. CONCEPTUAL FRAMEWORK

This study is conducted to analyze the effect of EMA and green innovation on financial performance, with environmental performance as a mediating variable. Based on a review of the literature and supported by findings from previous studies, a conceptual framework is formulated as shown in Figure 1:



Description:

—————▶ : Direct Effect  
 - - - - -▶ : Indirect Effect

Figure 1: Conceptual Framework

#### IV. RESEARCH METHOD

This study aims to provide empirical evidence on how the implementation of environmental management accounting (EMA) and green innovation affects a company's financial performance, with environmental performance as a mediating variable. The research focuses on manufacturing companies within the diversified industrial sub-sector listed on the Indonesia Stock Exchange (IDX) during the period 2021–2023. Data analysis was conducted using path analysis with the assistance of SPSS software. Financial and sustainability report data were collected from the official websites of each company and [www.idx.co.id](http://www.idx.co.id).

The sample was selected using purposive sampling, focusing on companies that met specific criteria relevant to the research objectives. Out of 45 companies, 13 met the requirements and were selected as the study sample. With a three-year observation period, a total of 39 data points were analyzed. This purposive approach was intended to ensure that the selected sample aligned with the research focus and objectives.

#### V. RESULT AND DISCUSSION

**Table 1. R Square Analysis**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.528 <sup>a</sup>	.279	.202	.02899
2	.847 <sup>a</sup>	.718	.698	.73768

Source: Data processed with SPSS 22

Based on Table 1, The coefficient of determination ( $R^2$ ) for financial performance is recorded at 0.202. The model explains 20.2% of the variation in financial performance through the variables of EMA, green innovation, and environmental performance, with the remaining 79.8% influenced by external or unobserved factors.

Meanwhile, the  $R^2$  value for the environmental performance variable is 0.698, meaning that environmental management accounting and green innovation explain 69.8% of the variation in environmental performance, an additional 30.2% is influenced by variables excluded from this study.

**Table 2. F Square Analysis**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.009	3	.003	3.613	.025 <sup>b</sup>
	Residual	.024	28	.001		
	Total	.033	31			
2	Regression	40.094	2	20.047	36.840	.000 <sup>b</sup>
	Residual	15.781	29	.544		
	Total	55.875	31			

Source: Data processed with SPSS 22

Based on Table 2, The F-test significance in Model 1 is 3.613, exceeds the F-table threshold of 2.90 and its significance level (0.025) is below 0.05, the model is considered valid. Similarly, Model 2 yields an F-value of 36.840 with a significance level of 0.000, indicating strong statistical validity for both models.

**Table 3. Hypothesis Test Results**

#### Hypothesis Test

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.013	.013		1.058	.299
	AML	7.983E-8	.000	.387	2.285	.030
	Green innovation	.027	.029	.276	.932	.359
	Environmental Performance	-4.350E-5	.007	-.002	-.006	.995
2	(Constant)	.032	.323		.098	.923
	AML	9.537E-7	.000	.112	1.095	.283
	Green innovation	3.273	.412	.812	7.953	.000

Source: Data processed with SPSS 22

**Hypothesis 1**

EMA contributes meaningfully and significantly to the improvement of financial performance, as indicated by a beta coefficient of 0.387 and a p-value of 0.030 ( $<0.05$ ). This suggests a direct and statistically significant relationship, thus Hypothesis H1 is accepted.

**Hypothesis 2**

The influence of green innovation on financial performance is found to be insignificant, as indicated by a positive beta coefficient of 0.276 and a p-value of 0.359 ( $>0.05$ ). This means the relationship is not statistically significant, and therefore, the hypothesis stating that green innovation has a positive and significant effect on financial performance is rejected.

**Hypothesis 3**

Environmental management accounting does not have a significant effect on environmental performance, as indicated by a positive beta coefficient of 0.112 and a p-value of 0.283 ( $>0.05$ ). This suggests that the relationship is not statistically significant. As a result, the hypothesis regarding the positive and significant impact of environmental management accounting on environmental performance fails to gain empirical support.

**Hypothesis 4**

The analysis reveals that green innovation has a strong positive effect on environmental performance, with a beta value of 0.812 and a highly significant p-value of 0.000. As such, the hypothesis asserting this positive relationship is confirmed.

**Hypothesis 5**

The analysis indicates that environmental performance exerts no meaningful influence on financial performance, as shown by a negative beta value of  $-0.002$  and a non-significant p-value of 0.995. Consequently, the corresponding hypothesis is rejected.

**Hypothesis 6**

Input:		Test statistic:	p-value:
$t_a$	7.953	Sobel test:	0.006
$t_b$	0.006	Aroian test:	0.00595312
		Goodman test:	0.006048
		Reset all	Calculate

Figure 2: Sobel Test Result

Result of the Sobel test and reviewed from the coefficient statistics, the calculated Sobel value is smaller, with a p-value of 0.995, which is greater than the 0.05 significance level. Therefore, there is no significant indirect effect. The proposed indirect effect of environmental management accounting on financial performance via environmental performance is statistically unsupported, leading to the rejection of the hypothesis.

**Hypothesis 7**

Input:		Test statistic:	p-value:
$t_a$	1.095	Sobel test:	0.00599991
$t_b$	0.006	Aroian test:	0.00443044
		Goodman test:	0.01472558
		Reset all	Calculate

Figure 3: Sobel Test Result

Results of the Sobel test show a p-value of 0.995, which is greater than the 0.05 significance level, indicating the absence of a significant indirect effect. Consequently, the hypothesis positing an indirect influence of green innovation on financial performance via environmental performance is not supported.

## Discussion

The results confirm that the application of Environmental Management Accounting (EMA) contributes positively and significantly to enhancing financial performance. This result suggests that EMA helps improve financial outcomes through better cost control and long-term planning. This aligns with Agustia et al. (2019) and Ikhsan (2008), who highlighted EMA's role in achieving eco-efficiency and attracting investors. These results are supported by stakeholder and signaling theories, suggesting that companies committed to environmental responsibility enhance reputation and investor confidence.

In contrast, green innovation did not significantly affect financial performance. Although it reflects environmental responsibility, green innovation requires substantial upfront costs that may reduce short-term profits. This finding aligns with Budi & Zuhrohtun (2023) and Mariawati et al. (2024), and contradicts Putri Fabiola & Khusnah (2022), emphasizing sectoral and financial limitations.

Furthermore, the analysis revealed that EMA does not significantly impact environmental performance. Limited disclosures and low eco-efficiency suggest that EMA practices remain symbolic and lack follow-through, consistent with Afazis & Handayani (2020).

In contrast, green innovation significantly influences the environment. This confirms Jermstittiparsert et al. (2020) and reflects the alignment of green practices with environmental sustainability and stakeholder expectations. However, environmental performance itself did not significantly influence financial performance. This suggests that while environmental efforts improve image, they do not immediately yield financial gains, as noted by Anggraeni (2015) and Kurnia et al. (2024).

Mediation tests also showed that environmental performance did not mediate the effect of EMA or green innovation on financial performance. These findings indicate that despite environmental initiatives, the costs incurred and lack of concrete environmental improvements may hinder financial benefits in the short term, consistent with Sari (2024) and contrary to Henri & Journeault (2010) and Intari & Khusnah (2023).

## VI. CONCLUSION AND SUGGESTION

Drawing upon the results of the comprehensive analysis previously discussed, this study arrives at several key conclusions aligned with its research objectives, specifically that (1) Environmental Management Accounting exerts a positive and statistically significant influence on financial performance; (2) Green innovation does not have a significant effect on financial performance; (3) Environmental Management Accounting does not have a significant effect on environmental performance; (4) Green innovation has a positive and significant effect on environmental performance; (5) Environmental performance was found to have no statistically significant impact on financial performance; (6) Environmental performance fails to mediate the relationship between Environmental Management Accounting and green innovation with financial performance. This study suggests that future research includes additional variables such as environmental audit and moderating variables like media exposure and leverage. Future researchers are advised to utilize a mixed-methods approach to obtain a more comprehensive understanding of how environmental management accounting and green innovation are implemented in corporate practices. One limitation of this study is its three-year time-series coverage and the use of purposive sampling, which led to a relatively small sample size.

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