



A Quantitative Study with SPSS 26: The Influence of Environmental Costs on Financial Performance with Managerial Ownership as Moderating

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ABSTRACT

Purpose: This study investigates and evaluates how managerial ownership moderates the impact of environmental costs on financial performance. **Methodology:** 14 firms in the basic materials industry were listed on the Indonesia Stock Exchange for the 2021 - 2023 period as a consequence of the sample technique's usage of purposive sampling. The association between variables was examined using moderated regression analysis, which was performed using SPSS 26. **Results:** According to the study, financial performance is impacted by both environmental costs and managerial ownership, but the impact of environmental costs on financial performance is not mitigated by managerial ownership. **Findings:** Although managerial ownership can enhance financial performance, and this study emphasizes the significance of environmental costs, the relationship between environmental costs and financial performance is not moderated by the level of management's shareholdings. **Novelty:** It resides in combining corporate governance elements which are comparatively understudied with environmental concerns. **Originality:** The study's integration of management ownership and environmental cost viewpoints into a single model adds to Indonesia's corporate governance and sustainability literature. **Conclusion:** The study's results show that environmental costs reflect the company's responsibility for environmental issues important to stakeholders. The insignificance of managerial ownership moderation suggests that environmental decisions are not entirely determined by shareholders but rather by external stakeholder pressure and regulation.

INTRODUCTION

The ability of a business to manage and use its resources, is referred to as financial performance. Financial reports provide information about the economic status and outcomes of the business in question during a specific period (Maritza et al., 2022) . In addition to providing information, financial performance functions as a gauge of a company's success, a tool for holding management accountable to owners, and a factor in decision-making (Mustafani et al., 2021). Return on Equity (ROE) functions as a stand-in for financial success in this study.

One of the profitability ratios that analysts and investors use to assess how well a business uses its equity capital to create profits is return on equity (ROE) (Wairisal, 2024). The more efficiently a corporation results in gains from its equity, the better its ROE. That implies that it makes it possible for internal and external stakeholders to comprehend the company's financial performance in a straightforward and quantifiable manner. As the industry grows, businesses need to be able to take into account not just the financial situation but also a variety of other effects that may occur, such as disregard for environmental management.

The following are examples of Indonesian businesses that disregard their environmental impact, which has an impact on their financial performance is PT Timah Tbk, which engaged in illegal mining and caused environmental pollution in 2015 - 2022, costing the state IDR 271,06 trillion in total damages to both forest and non-forest areas (Antaranews, 2024).

Table 1. Financial Condition of PT Timah Tbk 2021 - 2023 (in Million Rupiah)

Year	Assets	Liabilities	Capital	Sales	Profit/Loss
2020	14.571.700	9.577.564	4.940.136	15.215.980	(340.602)
2021	14.690.989	8.382.569	6.308.420	14.607.003	1.302.843
2022	13.066.976	6.025.071	7.041.903	12.504.297	1.041.563
2023	12.853.277	6.610.928	6.242.349	8.391.907	(449.672)

Source: (Rosmanidar et al., 2024)

Regarding PT Timah Tbk's example in Table 1, 2021 as capital rose in comparison to the year before, although debt and sales continued to decline. In contrast, sales, debt, assets, and profit or loss all decreased in 2022 and 2023. This is because, for those who have obtained permits from PT Timah Tbk, several private companies engage in illegal mining in the company's business permit area without considering environmental factors. This leads to environmental harm to PT Timah Tbk, which ultimately has a major impact on financial performance in 2023 (Rosmanidar et al., 2024).

One example of a case related to the environment is PT Aneka Tambang in 2021, which establishes sungai and pantai pesisir to support the mangrove and reef ecosystems in the Buli harbor while addressing the biological and chemical oksigen needs (Jatam, 2021). In addition, according to Bantennews (2022), PT Unggul Indah Cahaya Tbk has a PROPER merah for 2020 - 2021. Another example of a pabrik is Chandra Asri Group in Ciwandan, Anyer, in 2024. Any bau menyengat atau tidak sedap from pabrik pembakaran activities that result in the public experiencing health problems (Kompas, 2024).

Environmental expenditures must be recorded individually according to their burden classification when businesses employ environmental management strategies to boost financial performance (Surotenojo et al., 2019). Ningsih et al. (2022) defines environmental costs as expenses resulting from or potentially output from poor environmental quality. Companies view environmental charges as a long-term investment since current expenditures can enhance the company's brand and subsequently increase stakeholder trust (Asjuwita & Agustin, 2020) . That supports studies by Syaputra & Arsjah (2024) and Al-Waeli et al. (2022) that show environmental expenses significantly and favorably impact financial performance.

However, one significant element that may have an impact on financial performance is managerial ownership. The ratio of managerial share ownership to the total number of outstanding shares is known as managerial ownership (Romadoni & Pradita, 2021). The percentage of firm shares owned by management that is revealed in the financial statements' notes serves as an indicator of this status. To reduce losses for stakeholders, managers can effectively manage these interactions and comprehend the stakeholder environment with the aid of stakeholder theory (Hermawansah, 2023). The findings of studies by Sari & Praselia (2024) and Holly & Lukman (2021) demonstrate that managerial ownership has a favorable and noteworthy impact on financial success.

The stakeholder theory, put forth by Freeman (1984), is used in this study. It states that a company is not an entity that merely conducts its operational activities rather, it must establish reciprocal relationships and benefits for stakeholders, play the role of a policy maker, and have the ability to influence stakeholders' positions and vice versa. Additionally, to highlight the significance of recognizing, quantifying, and evaluating environmental expenses that could be associated with any business's production activities.

The confluence of various factors from earlier research, including financial performance, managerial ownership, and environmental expenses, accounts for the study's similarities. This study differs in that it uses ROE as a proxy for financial performance. That it, done because of the widespread environmental pollution that many companies are committing, which makes them think about their role in environmental sustainability (Safitri et al., 2024).

Investors, stakeholders, and shareholders are drawn to the company's application of environmental expenses, which takes the form of open reporting of environmental costs. Companies that are dedicated to environmental issues see an increase in sales and draw in more clients who care about sustainability. A company's concern for the environment increases with the amount of environmental costs it incurs. A study by Aliamutu et al. (2023) found a positive and significant correlation between financial success and environmental expenses. The results of this study are in line with research conducted by Harvest & Ephraim (2024), Putri (2023), Rini & Desi (2021), and (Hapsari et al., 2021).

H₁: Environmental costs impact on financial performance

The percentage of shareholders that originate from the management side is known as managerial ownership, according to (Nisak, 2022). As a result, managers will be enthusiastic about increasing profitability. Greater managerial ownership leads to improved oversight, which increases the business's profitability. Yuniarti et al. (2023) state that the corporate sector uses stakeholder theory as a tactic to maintain relationships and consider the interests of stakeholders, including creditors, employees, suppliers, consumers, investors, the government, employees, and the local community. Research by Nasution et al. (2024) research, indicates that financial performance is impacted by managerial ownership. In the meantime, Fibriani et al. (2022), Nazhila & Amin (2024), Islami & Wulandari (2023), and Sari et al. (2020) conducted studies that yielded findings consistent with that.

H₂: Managerial ownership impact on financial performance

Because management prioritizes long-term, sustainable methods that boost firm value, high managerial ownership can reinforce the link between environmental costs and financial performance (Rohman et al., 2024). This is consistent with the viewpoint of stakeholder theory, which emphasizes that businesses have obligations to all stakeholders, including the environment, society, the government, and customers, in addition to shareholders (Saputri et al., 2024). The percentage of a company's shares held by management is known as managerial ownership, and it has the power to influence how much environmental expenses effect financial results.

H₃: Environmental costs affect financial performance with managerial ownership as a moderating variable

METHOD

Type of Research

This study uses a quantitative methodology and secondary data from annual reports, sustainability reports, and PROPER accomplishments in basic materials sector companies listed on the Indonesia Stock Exchange for the years 2021 - 2023, all accessed through the official Indonesia Stock Exchange website, www.idx.co.id.

Research Variables

Financial Performance is the capacity of the business to efficiently manage and govern its resources throughout a specific time frame. The Return on Equity (ROE) formula serves as a proxy for the financial performance evaluation scale, which is a ratio as follows (Arifianti & Widianingsih, 2023).

$$ROE = \frac{\text{Net profit}}{\text{Total equity}} \times 100\%$$

Environmental Costs is the expense incurred when environmental quality is harmed or degraded as a result of the company's production process. The ratio used in this study's environmental cost measuring scale can be calculated using the following formula Azizah & Cahyaningtyas (2023), as follows:

$$\text{Environmental Costs} = \frac{\text{Environmental costs}}{\text{Net profit after tax}}$$

Managerial Ownership this is when managers, including directors and commissioners, own shares in the company so since the value of their shares is directly tied to the company's ability to operate and expand. The study's measurement scale is the ratio as determined by the Agatha et al. (2020) formula, which is as follows:

$$\text{Kepemilikan manajerial} = \frac{\text{Total managerial shares}}{\text{Total outstanding shares}} \times 100\%$$

Population and Sample

Table 2. Selection and Sampling Criteria

Sample Selection Process	Total of Companies That Fill the Criteria	Total of Companies That Do Not Fill the Criteria
Total basic materials sector companies listed on the Indonesia Stock Exchange for the period 2021 - 2023.	103	
Total basic materials sector companies that published annual report 2021 - 2023.	73	30
Total basic materials sector companies that published sustainability report for the period 2021 - 2023.	30	43
Total basic materials sector companies that received PROPER for 2021 - 2023.	14	16
Total samples that fill the criteria.	14 x 3 Tahun = 42	

Sources: *Processed Data, 2025*

Table 3. Research Sample

No.	Company Name	Code
1.	Aneka Tambang Tbk	ANTM
2.	Avia Avian Tbk	AVIA
3.	Barito Pacific Tbk	BRPT
4.	Cemindo Gemilang Tbk	CMNT
5.	Vale Indonesia Tbk	INCO
6.	Indocement Tunggul Prakarsa Tbk	INTP
7.	Steel Pipe Industry of Indonesia Tbk	ISSP
8.	Lautan Luas Tbk	LTLS
9.	Madusari Murni Indah Tbk	MOLI
10.	Pinago Utama Tbk	PNGO
11.	Solusi Bangun Indonesia Tbk	SMCB
12.	Semen Indonesia (Persero) Tbk	SMGR
13.	Timah Tbk	TINS
14.	Chandra Asri Petrochemical Tbk	TPIA

Sources: *Idx, 2025*

RESULTS AND DISCUSSION

RESULTS

The moderated regression analysis test tool using SPSS 26 software was employed as the data analysis method in this investigation.

Table 4. Descriptive Statistics

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Environmental Costs	42	-.130188	.9559566	.0849740	.1671356
Managerial Ownership	42	.000000	.7944117	.1433961	.2627681
Financial Performance	42	-.053183	.2961037	.0907183	.0701681
Valid N (listwise)	42				

Sources: *SPSS 26, 2025*

The standard deviation is higher than the average, indicating bad outcomes since the standard deviation reflects the variation from the variable; the data are rather large. The average value is 0,0849740660, and the standard deviation is 0,1671356106. However, because the data is varied and normally distributed, statistically, it is not an issue.

The standard deviation is larger than the average value, 0,2627681021, while the average value is 0,1433961954. This suggests that the data is heterogeneous and has a wide range of variance.

The standard deviation is less than the average value, indicating that the research variable data is homogeneous and shows rather good results. The average is 0,0907183916, while the standard deviation is 0,0701681955. This indicates that net profit from equity has been generated by the business.

Table 5. Tests of Normality

One-Sample Kolmogorov-Smirnov Test	
	Unstandardized Residual
Test Statistic	.079
Asymp. Sig. (2-tailed)	.200 ^{c,d}

Sources: *SPSS 26, 2025*

The regression model has been regularly distributed, and the condition of data normality has been satisfied, as indicated by the asymptotic significance level (2-tailed sig.) of 0,200 > 0,05.

Table 6. Test of Multicollinearity

Coefficients ^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Environmental Costs	.931	1.074
	Managerial Ownership	.931	1.074

Sources: SPSS 26, 2025

Because there is no significant connection between the independent variables, each variable satisfies the requirements for having a tolerance value > 0,10 and a VIF value < 10, making the study data appropriate for use.

Table 7. Test of Autocorrelation

Model Summary ^b						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
1	.457 ^a	.209	.168	.06399	1.663	

a. Predictors: (Constant), Managerial Ownership, Environmental Costs

Sources: SPSS 26, 2025

The Durbin-Watson value, as determined by the autocorrelation test, is 1,663, falling between -2 and +2.

Table 8. Test of Heteroskedasticity

Coefficients ^a				
Model		t	Sig.	
1	Environmental Costs	-3.294	.062	
	Managerial Ownership	4.207	.070	

Sources: SPSS 26, 2025

The significance values for management ownership and environmental costs are 0,070 and 0,062, respectively. Each variable's significance value indicates that there is no heteroscedasticity because it is greater than 0,05.

Table 9. Moderated Regression Analysis

Coefficients ^a			
Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	.523	.093
	Environmental Costs	-.049	.030
	Managerial Ownership	.110	.043
	Environmental Costs * Managerial Ownership	-16.197	21.146

a. Dependent Variable: Financial Performance

Sources: SPSS 26, 2025

$$Y = 0,523 - 0,049X_1 + 0,110X_2 - 16,197X_1X_2 + e$$

The environmental costs (X_1), managerial ownership (X_2), and interaction environmental costs and managerial ownership ($X_1 X_2$) all have a value of 0, according to the constant (α) value of 0,523.

The environmental cost variable hurts financial performance, as indicated by the regression coefficient value (β_1) of -0,049. This indicates that, assuming all other independent variables remain constant, there will be a 0,493 or 49,3% drop in financial performance for every 0,01 or 1% increase in environmental expenses.

The management ownership variable has a positive and unidirectional impact on financial performance, as indicated by the regression coefficient (β_2) value of 0,110. This means that, provided all other factors remain unchanged, there will be a 0,110 or 11% boost in financial performance for every 0,01 or 1% rise in environmental disclosure.

The value of the regression coefficient (β_3) is -16,197, indicating that management ownership and environmental expenses have a negative and non-uniform impact on financial performance. Assuming all other independent variables remain unchanged, the financial performance value will drop by 16,197 if management ownership and environmental costs rise by 0,01 or 1%.

Table 10. Test of R²

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.470 ^a	.221	.159	6.43322%

Sources: SPSS 26, 2025

R Square is known to be 0,221 in table 10. This illustrates the 22,1% contribution of the independent variables (managerial ownership and environmental costs) influence and interaction with the dependent variable (financial performance). In the meantime, factors not included in this study have an impact on the remaining 77,9%.

Table 11. Test of F

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	445.985	3	148.662	3.592	.022 ^b

Sources: SPSS 26, 2025

According to the F test results, H_0 is rejected and H_1 is approved since the significance value of 0,022 satisfies the requirement that the significance value be less than 0,05. We can conclude that financial performance is impacted by management ownership, interaction factors, and all environmental costs.

Table 12. Test of t

Coefficients ^a			
Model		t	Sig.
1	Environmental Costs	-2.603	.010
	Managerial Ownership	2.570	.014
	Environmental Costs* Managerial Ownership	-.766	.448

a. Dependent Variable: Financial Performance

Sources: SPSS 26, 2025

The impact of environmental costs on financial performance is known to have a significance value of 0,010, which satisfies the requirement that the significance value be less than 0,05, hence rejecting H_0 and accepting H_1 . The conclusion is that financial performance is impacted by environmental costs, or H_1 is approved.

H_0 is rejected and H_1 is approved because of the known significance value of 0,014 for managerial ownership on financial performance, which satisfies the requirement of a significance value $< 0,05$. The conclusion is that financial performance is impacted by managerial ownership, or H_2 is acknowledged.

The significant value for the relationship between managerial ownership and environmental costs on financial performance is 0.448, which is below the threshold of a significance value of less than 0.05. It is not possible to use the moderating variable as a moderating variable; instead, it only functions as an independent predictor variable in the relationship model that was created. The management ownership variable is not appropriate for use as a moderating variable in this study. The conclusion is that either H_3 is rejected.

DISCUSSION

The Impact of Environmental Costs on Financial Performance

Stakeholder theory, which views environmental costs as an investment that improves the company's relationship with the external environment because current spending has the potential to improve the company's reputation over time. This will also impact the load that the business bears, which will ultimately affect the business's profit as one of the metrics used to gauge its financial performance and which stakeholders will take into account when making choices (Putri, 2023). The results of this study are in line with research by Harvest & Ephraim (2024), Putri (2023), and Rini & Desi (2021), which discovered that environmental costs affect financial performance. According to ROE, the more environmental charges a company incurs, the better its financial performance will be.

The Impact of Managerial Ownership on Financial Performance

When it comes to financial success, managerial ownership has benefits and purposes. Therefore, greater managerial ownership tends to increase a company's financial performance. In this case, managers' interests align with those of shareholders and other stakeholders since they have a direct stake in the company's financial performance. According to stakeholder theory, the ability to shape management choices to maximize the use of all corporate resources including capital, personnel, and tangible assets to generate additional value that can boost financial performance. According to research Fibriani et al. (2022) and Nazhila & Amin (2024), environmental expenses have an impact on financial performance.

The Impact of Environmental Costs on Financial Performance with Managerial Ownership as a Moderating Variable

The relationship between environmental costs and financial performance is not much changed by the presence of managers' stock; environmental expenses have an equal impact on the company's financial performance regardless of managers' stock ownership. This is caused by a number of things, including the fact that managers control a small percentage of the company's shares, making it insufficiently powerful to affect strategic choices pertaining to environmental costs. Furthermore, corporate policies or government regulations have a greater impact on environmental investment decisions than do managers' incentives as shareholders. Because management's ownership of shares has not been able to promote the attainment of a balance between financial and non-financial interests, this finding runs counter to stakeholder theory (Almatin & Simatupang, 2025).

CONCLUSION

Financial performance is influenced by environmental expenses, according to the study's findings. The more environmental expenses the business incurs, the better its financial success will be as determined by ROE. In the meantime, financial performance is improved by managerial ownership. Because managers have a direct stake in the company's financial performance, their interests coincide with those of shareholders and other stakeholders in this situation. Consequently, a company's financial performance tends to improve with more managerial ownership. However, the impact of environmental expenses on financial performance is constant, irrespective of the degree of managerial ownership.

The author suggests that future researchers review scientific work and include other factors that can moderate the influence of environmental costs on financial performance, such as green accounting or discoveries that can be used as a source of reference or innovation. Companies can also see from the results of research that can contribute to financial performance, such as environmental costs and managerial ownership. Finally, investors should consider environmental cost implementation, corporate governance accomplishments, and financial performance before purchasing stock in a company. It is intended that by taking these factors into account, this study will assist investors in selecting a business that may actually be utilized as a suitable cooperating partner.

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