Environmental Performance and Financial Performance on Greenwashing Practices

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Abstract

Greenwashing has emerged as an increasingly critical concern as stakeholders demand stronger corporate environmental accountability, particularly within the energy sector given its substantial environmental footprint. The disparity between environmental disclosure and actual environmental performance risks misleading stakeholders and undermining the effectiveness of climate-related policies. This study examines the effects of environmental performance and financial performance on greenwashing practices, with particular attention to the moderating role of financial performance in this relationship. The research gap addressed here stems from inconsistent findings in prior studies and the scarcity of empirical evidence from the Indonesian context. Employing a quantitative approach, this study draws on secondary data from energy sector companies listed on the Indonesia Stock Exchange (IDX) during the 2021–2023 period. A purposive sampling technique yielded a final sample of 36 companies, corresponding to 108 firm-year observations. Data were analyzed using panel data regression with an interaction model in Stata. Greenwashing was measured via a greenwashing index, environmental performance was proxied by environmental capital expenditure relative to revenue, and financial performance was assessed using Return on Assets (ROA). The results indicate that environmental performance has a positive and significant effect on greenwashing practices, whereas financial performance exerts no significant direct effect. Notably, financial performance significantly moderates the relationship between environmental performance and greenwashing: the negative coefficient of the interaction term suggests that stronger financial performance attenuates the positive association between environmental performance and greenwashing behavior. Based on these findings, this study recommends enhancing the quality of sustainability disclosure and adopting output-based environmental performance indicators in future research.

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1. Introduction

Environmental awareness has increasingly become a central focus of business practice, serving as a key indicator of corporate health and long-term viability. Climate change, air and water pollution, industrial waste, and biodiversity loss expose companies to both physical and transition risks, ranging from operational disruptions to asset impairment. International commitment to corporate environmental performance is reflected in a series of global agreements, regulations, and reporting standards, including

the Paris Agreement (2015), which calls for limiting global temperature increases; the United Nations Sustainable Development Goals (SDGs) 2030, particularly Goals 12 and 13 on responsible consumption and production and climate action; and disclosure frameworks such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD), which promote transparent reporting on climate-related impacts and risks. These policy pressures have encouraged companies to more actively communicate "green" claims in their annual reports. However, such claims are not always aligned with concrete environmental actions, thereby increasing the risk of greenwashing.

This gap between environmental disclosure and actual environmental performance manifests as greenwashing, a practice whereby companies engage in strategic environmental communication that creates an impression of being "greener" than their actual environmental performance warrants (Lee & Raschke, 2023; Marquis et al., 2016; Yu et al., 2020). Greenwashing obscures firms' genuine quality signals and potentially undermines the effectiveness of climate policy. Accordingly, it is important to examine the factors that drive firms toward greenwashing, particularly by distinguishing substantive environmental action from symbolic narrative. One such factor with strong theoretical relevance is corporate environmental performance.

Corporate environmental performance refers to a firm's efforts to mitigate its negative environmental impact (Li et al., 2023; Zhang et al., 2023), typically achieved through sustainable operational and investment measures such as natural resource management, carbon emission reduction, energy efficiency, and waste management. Firms genuinely committed to environmental sustainability tend to allocate substantial resources toward these initiatives, and environmental performance thus reflects the extent to which a firm fulfills its sustainability obligations and contributes to broader global environmental goals.

A second factor hypothesized to influence greenwashing is financial performance, which reflects a firm's capacity to generate profit from its resources. Return on Assets (ROA) is among the most widely used indicators of financial performance, capturing how effectively management utilizes assets to generate earnings. Prior research suggests that financial performance can shape corporate behavior in sustainability practices; however, limited attention has been given to its role in moderating the relationship between environmental performance and greenwashing.

Firms with higher profitability possess a "resource cushion" that enables greater investment in environmental initiatives, regulatory compliance, and beyond-compliance sustainability efforts. When financial capacity is strong, environmental investments tend to be more credible and substantive, reducing firms' incentives to rely on symbolic, surface-level green claims. Conversely, when financial performance is weak, financial constraints may limit a firm's ability to fully translate environmental commitment into action, even amid improving environmental performance, thereby creating conditions conducive to greenwashing (Fan et al., 2024; Hassan & Guo, 2017).

This study examines the effects of environmental performance and financial performance on greenwashing practices, as well as the moderating role of financial performance in the relationship between environmental performance and greenwashing. This inquiry is motivated by the mixed findings reported in prior literature regarding these relationships (Gil-Cordero et al., 2021; Li et al., 2023; Zhang et al., 2023). The study focuses on energy sector companies in Indonesia, addressing a notable empirical gap, as most prior research has drawn on samples from energy firms in other countries, leaving the Indonesian context comparatively underexplored. The energy sector was selected given its substantial environmental footprint: the energy and transportation sectors together accounted for 50.6% of Indonesia's total emissions in 2022, equivalent to approximately 1 gigaton of CO2eq (LCDI Indonesia, 2022).

This study addresses a theoretical gap in the greenwashing literature by conceptualizing greenwashing as the divergence between symbolic environmental communication and substantive

environmental performance. While prior studies have extensively examined the direct relationships among environmental performance, financial performance, and greenwashing, comparatively little attention has been paid to how financial performance may condition the relationship between environmental performance and greenwashing, particularly within the Indonesian energy sector.

The novelty of this study lies in positioning financial performance not merely as an independent determinant of greenwashing, but as a moderating variable. This framing offers a more nuanced understanding of whether financially stronger firms are better positioned to translate environmental commitment into substantive action, thereby reducing their propensity for greenwashing. In other words, the study investigates whether financial strength enhances the credibility of environmental performance in curbing symbolic sustainability claims.

This study contributes to the sustainability accounting literature by demonstrating that environmental performance should be understood not merely as a disclosure issue, but as evidence of substantive environmental accountability. By employing greenwashing as the outcome variable, this study assesses whether firms' environmental claims are underpinned by genuine environmental commitment or function primarily as symbolic communication in response to stakeholder pressure. In doing so, the study extends stakeholder theory by illustrating that firms may respond to sustainability expectations through either authentic environmental action or symbolic green narratives. The findings of this study are intended to advance a more comprehensive understanding of the factors driving greenwashing practices in Indonesia, while offering practical implications for stakeholders, investors, and regulators seeking to evaluate corporate sustainability commitments more objectively.

2. Literature Review

A. Stakeholder Theory

Stakeholder theory, first proposed by Freeman (1984), posits that a firm's survival depends on its ability to manage and balance the interests of diverse stakeholder groups. Within the sustainability context, stakeholder pressures and expectations shape firms' choices between substantive actions, such as environmental investment, and symbolic actions, including selective disclosure and normative claims unsupported by actual performance (Lyon & Montgomery, 2015; Walker & Wan, 2012). Stakeholder theory thus offers a comprehensive lens for understanding the underlying causes of greenwashing: such practices arise when firms prioritize projecting a green image to secure public trust, even in the absence of substantive evidence of sustainability performance.

B. The Influence of Environmental Performance on Greenwashing Practices

Environmental performance describes the extent to which a company's processes and outputs align with sustainability principles, encompassing activities such as emission reduction, energy efficiency, waste management, and resource conservation (Zhang et al., 2023). In practice, however, stakeholder pressure is not always met with substantial operational improvements. Some firms instead adopt a green branding strategy that emphasizes claims and symbols without corresponding concrete action, using this approach as a quick means of maintaining reputation and securing market position (Frendy et al., 2024; Gil-Cordero et al., 2021). Recent empirical findings indicate that improved environmental performance tends to reduce a firm's propensity to engage in greenwashing, as it narrows the gap between "talk" and "walk" (Frendy et al., 2024; Zhang et al., 2023). Other evidence, however, suggests that disclosing environmental performance without verified performance improvements is insufficient to curb greenwashing; indeed, such disclosure may even facilitate greenwashing when unsupported by control mechanisms or third-party audits (Du et al., 2022). Based on this theoretical and empirical foundation, the following hypothesis is proposed:

H1. Environmental performance negatively impacts greenwashing practices

C. The Influence of Financial Performance on Greenwashing Practices

Financial performance reflects a company's effectiveness in utilizing its resources to generate profits over a given period. In practice, some firms engage in greenwashing to maintain their reputation and attract investors. This behavior arises in response to stakeholder pressure and expectations, as well as firms' efforts to preserve legitimacy in the public sphere (Du et al., 2022; Xu et al., 2025). This aligns with stakeholder theory, which suggests that external expectations can prompt firms to adjust their communication narratives, even when such adjustments do not fully correspond to actual internal practices. Empirical findings indicate that greenwashing can foster positive market perceptions, which in turn may be associated with improved financial performance (Purnamasari & Umiyati, 2024). Conversely, other evidence suggests that firms with weaker financial conditions are more susceptible to engaging in greenwashing as a means of preserving corporate image (Du et al., 2022). Based on this theoretical and empirical foundation, the following hypothesis is proposed:

H2. Financial performance has a positive effect on greenwashing practices

D. The Effect of Environmental Performance on Greenwashing Practices, Moderated by Financial Performance

Companies with high profitability possess greater financial flexibility, or a "resource cushion," that can be allocated to environmental investments, regulatory compliance, and sustainability initiatives beyond minimum requirements (Velte, 2022; Malik et al., 2025). Within the context of stakeholder theory, firms are expected to respond to stakeholder pressure for environmental responsibility. However, the extent to which firms can respond through substantive environmental action may depend on their financial capacity. Firms with stronger financial performance are generally better positioned to support environmental claims with real investments, such as green technology, emission reduction programs, waste management systems, and external sustainability assurance (de Freitas Netto et al., 2020; Velte, 2022), and are therefore less likely to rely on symbolic strategies that merely create an impression of environmental responsibility.

Conversely, firms with weaker financial performance may face resource constraints that limit their ability to fully implement substantive environmental initiatives. Under such conditions, even when firms attempt to improve environmental performance, limited financial resources may prevent them from sustaining consistent and measurable environmental action. As a result, these firms may continue to rely on symbolic green narratives to maintain legitimacy and stakeholder trust, allowing greenwashing practices to persist (de Freitas Netto et al., 2020; Berrone et al., 2023). This reasoning is consistent with prior studies suggesting that financial capacity shapes firms' ability to support environmental disclosure and sustainability practices (Fan et al., 2024; Hassan & Guo, 2017).

Thus, financial performance is expected to function as a boundary condition in the relationship between environmental performance and greenwashing. Specifically, the negative effect of environmental performance on greenwashing is predicted to be stronger among firms with higher financial performance, given their greater capacity to translate environmental commitment into substantive action (Velte, 2022; Malik et al., 2025). Conversely, this negative effect may be weaker among firms with lower financial performance, as financial constraints can limit the credibility and consistency of their environmental initiatives. Based on this reasoning, the following hypothesis is proposed:

H3. Financial performance moderates the relationship between environmental performance and greenwashing practices

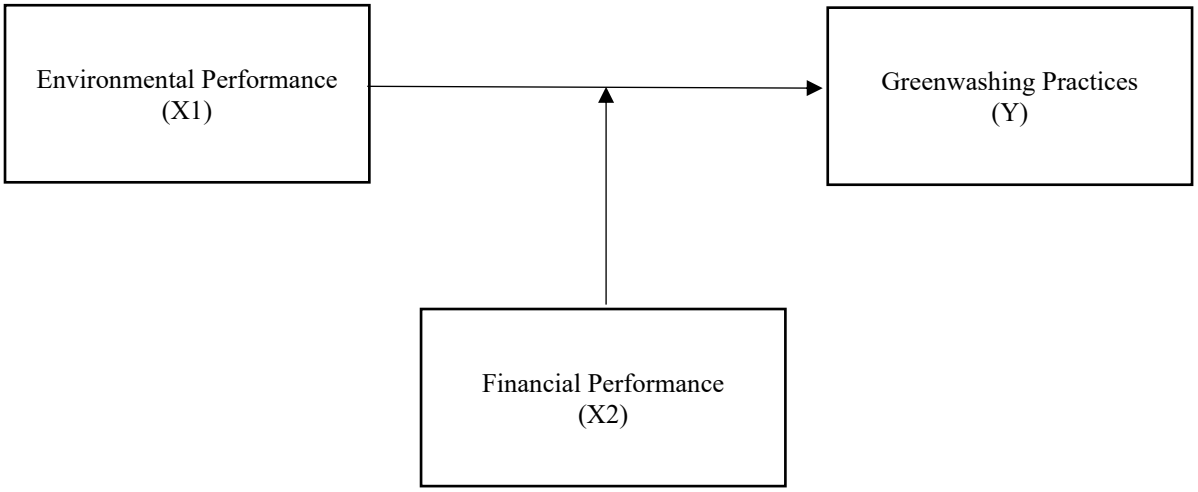

Figure 1. Research Framework

3. Method

A. Research Design

This study adopts a quantitative approach using secondary data. The population comprises energy sector companies listed on the Indonesia Stock Exchange during the 2021 to 2023 period. The sample was selected using purposive sampling, restricted to companies that published complete annual reports and sustainability reports for all three years. Of the 90 listed energy companies, 36 met these criteria and were selected, yielding 108 firm-year observations (36 companies multiplied by 3 years). Given that the data possess both cross-sectional and time-series dimensions, this study applies panel data regression analysis. The regression model is used to examine the effects of environmental performance and financial performance on greenwashing practices, as well as the moderating role of financial performance in this relationship. In addition, CSR, firm size, and leverage are included as control variables to mitigate potential omitted variable bias. Hypothesis testing is conducted at a 5% significance level, and all data processing and statistical analyses are performed using Stata software.

B. Definition and Operationalization of Variables

The dependent variable in this study is greenwashing practices. Referring to previous research, greenwashing practices are measured using the company greenwashing index scale (Zhang et al., 2023).

$$\text{Green Index} = \frac{Total\ Skor\ Simbolik}{Total\ Skor\ Substantif + 1} \quad (1)$$

The independent variable in this study is environmental performance. Environmental performance is measured using the ratio of a company's Environmental Capital Expenditure to total revenue (Zhang et al., 2023)

$$\text{Environmental Performance} = \frac{Environmental\ capital\ expenditures}{Revenue} \quad (2)$$

The moderating variable in this study is financial performance, measured using the company's Return on Assets (ROA) (Li et al., 2023).

$$\text{Return on Assets (ROA)} = \frac{Laba\ Bersih}{Total\ Aset} x\ 100\% \quad (3)$$

To reduce potential omitted variable bias and improve the robustness of the regression model, this study includes several control variables that have been widely used in prior greenwashing research,

namely Corporate Social Responsibility (CSR), Firm Size (SIZE), and Leverage (LEV). CSR is measured using the Corporate Social Responsibility Disclosure Index (CSRDI), calculated based on the proportion of CSR items disclosed in the company's annual report and sustainability report. Firm size is measured as the natural logarithm of total assets, while leverage is measured as the ratio of total liabilities to total assets.

4. Result and Discussion

A. Research Data

The population consists of energy sector companies listed on the Indonesia Stock Exchange during the 2021 to 2023 period. The sample was selected using purposive sampling, restricted to companies that published complete annual reports and sustainability reports for all three years. Of the 90 listed energy companies, 36 met these criteria and were selected, yielding 108 observations (36 companies multiplied by 3 years). Based on the descriptive statistics presented in Table 1, the greenwashing variable (GW) has a mean value of 1.134 and a standard deviation of 0.184, ranging from a minimum of 0.857 to a maximum of 1.833. Environmental performance (EP) has a mean value of 0.140 and a standard deviation of 0.620, ranging from a minimum of 0.000 to a maximum of 4.851. Financial performance, measured by Return on Assets (ROA), has a mean value of 0.166 and a standard deviation of 0.207, ranging from a minimum of 0.001 to a maximum of 1.684. Among the control variables, CSR has a mean value of 0.392 and a standard deviation of 0.185, with minimum and maximum values of 0.088 and 0.835, respectively. Firm size (SIZE) has a mean value of 28.760, a standard deviation of 2.826, a minimum value of 20.943, and a maximum value of 40.030. Leverage (LEV) has a mean value of 0.006 and a standard deviation of 0.018, ranging from a minimum of 0.000 to a maximum of 0.094.

In short, these descriptive statistics in Table 1 indicate considerable variation among the sample firms in greenwashing practices, environmental performance, financial performance, CSR disclosure, firm size, and leverage. The relatively high maximum value of EP compared to its mean suggests that several firms allocate substantially higher environmental expenditure relative to revenue than others in the sample. Meanwhile, the low mean value of LEV indicates that the sampled energy companies generally maintained relatively low leverage during the observation period.

B. Pearson Correlation Analysis

The Pearson correlation analysis was conducted to examine the bivariate relationships among the study variables and to identify potential multicollinearity issues. As shown in Table 2, greenwashing (GW) is negatively correlated with CSR disclosure ($r = -0.163$, $p < 0.10$) and firm size (SIZE) ($r = -0.283$, $p < 0.01$), indicating that firms with broader CSR disclosure and larger organizational size tend to exhibit lower levels of greenwashing practices. In contrast, leverage (LEV) is positively associated with greenwashing ($r = 0.262$, $p < 0.01$), suggesting that firms with higher debt levels may have a greater tendency to engage in symbolic environmental communication. Environmental performance (EP) is positively associated with CSR disclosure ($r = 0.162$, $p < 0.10$) and leverage ($r = 0.544$, $p < 0.01$), while showing a negative relationship with firm size ($r = -0.267$, $p < 0.01$). Financial performance (ROA) does not exhibit significant correlations with greenwashing, environmental performance, or the control variables, indicating that its relationship with these variables may not be adequately captured through simple bivariate analysis.

Among the control variables, CSR disclosure is positively correlated with firm size ($r = 0.280$, $p < 0.01$), suggesting that larger firms tend to provide more extensive sustainability disclosures. Furthermore, leverage is strongly and negatively correlated with firm size ($r = -0.672$, $p < 0.01$), indicating that larger firms generally maintain lower leverage ratios during the observation period. Overall, the correlation coefficients are below the commonly accepted threshold of 0.80, indicating that

multicollinearity is unlikely to be a serious concern in the regression analysis. Therefore, all variables are retained for subsequent hypothesis testing.

Table 1. Descriptive Statistics

Variable	N	Mean	SD	Min	Median	Max
GW	108	1.134	0.184	0.857	1.105	1.833
EP	108	0.140	0.620	0.000	0.003	4.851
ROA	108	0.166	0.207	0.001	0.102	1.684
CSR	108	0.392	0.185	0.088	0.346	0.835
SIZE	108	28.760	2.826	20.943	28.932	40.030
LEV	108	0.006	0.018	0.000	0.000	0.094

Source: Processed data (2026)

Table 2. Pearson Correlation Matrix

Variables	(1) GW	(2) EP	(3) ROA	(4) CSR	(5) SIZE	(6) LEV
(1) GW	1.000					
(2) EP	0.061	1.000				
	(0.530)					
(3) ROA	0.005	0.042	1.000			
	(0.963)	(0.664)				
(4) CSR	-0.163*	0.162*	0.133	1.000		
	(0.092)	(0.095)	(0.169)			
(5) SIZE	-0.283***	-0.267***	0.128	0.280***	1.000	
	(0.003)	(0.005)	(0.187)	(0.003)		
(6) LEV	0.262***	0.544***	-0.036	-0.030	-0.672***	1.000
	(0.006)	(0.000)	(0.714)	(0.758)	(0.000)	

***p < 0.01, **p < 0.05, p < 0.10

Source: Processed data (2026)

Table 3. Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
EP	5.876	0.170
ROA	1.063	0.941
EP × ROA	6.150	0.163
CSR	1.285	0.778
SIZE	2.156	0.464
LEV	2.628	0.381
Year 2022	1.398	0.715
Year 2023	1.503	0.665
Mean VIF	**2.757**	-

Source: Processed data (2026)

Table 4. Breusch-Pagan Heteroskedasticity Test

Test Statistic	Value
Test	Breusch-Pagan / Cook-Weisberg Test
Dependent Variable	Fitted Values of GW
Null Hypothesis (H0)	Constant Variance (Homoskedasticity)
$\chi^2(1)$	26.43
Prob > χ^2	0.0000

Source: Processed data (2026)

C. Multicollinearity Test

A multicollinearity test was conducted to determine whether high correlations exist among the independent variables included in the regression model. Multicollinearity was assessed using the Variance Inflation Factor (VIF), where a value below 10 indicates that multicollinearity is not a serious concern. As presented in Table 3, the VIF values range from 1.063 to 6.150, with a mean VIF of 2.757. The highest VIF value is observed for the interaction term between environmental performance and financial performance (EP × ROA), at 6.150, which remains below the commonly accepted threshold of 10. Furthermore, all tolerance values (1/VIF) exceed 0.10. It can therefore be concluded that multicollinearity is not a concern in the regression model, and all variables can be retained for further analysis.

D. Heteroskedasticity Test

The heteroskedasticity test was conducted using the Breusch–Pagan/Cook–Weisberg test to examine whether the variance of the residuals remains constant across observations. The null hypothesis of this test states that the residuals are homoskedastic, indicating constant variance. The results of the Breusch–Pagan test are presented in Table 4. The test produces a chi-square statistic of 26.43 with a probability value of 0.0000. Since the probability value is below the 5 percent significance level, the null hypothesis of constant variance is rejected. This result indicates the presence of heteroskedasticity in the regression model. To address this issue and ensure reliable statistical inference, the regression analysis is estimated using robust standard errors. The use of robust standard errors corrects for heteroskedasticity and provides more reliable coefficient estimates and significance tests.

E. Model Selection Test

To determine the most appropriate estimation model, a Hausman test was conducted to assess whether the Fixed Effect Model (FEM) or the Random Effect Model (REM) should be adopted. The test results indicate a statistically significant difference between the coefficient estimates of the two models. Accordingly, the null hypothesis that the Random Effect Model is more efficient is rejected, and the Fixed Effect Model is selected as the most appropriate estimation technique. This selection implies that unobservable firm-specific characteristics may influence greenwashing practices and are correlated with the explanatory variables included in the model. By controlling for these time-invariant firm-specific effects, the Fixed Effect Model provides more consistent and reliable coefficient estimates. Accordingly, all subsequent regression analyses in this study are estimated using the Fixed Effect Model.

F. Regression Test

Table 5 presents the regression results examining the effect of environmental performance, financial performance, and their interaction on greenwashing practices. Three regression models are estimated. Model 1 includes the main independent variables, namely environmental performance (EP), financial performance (ROA), and the interaction term (EP × ROA). Model 2 incorporates the control variables, including CSR disclosure, firm size (SIZE), and leverage (LEV). Model 3 further includes year fixed effects to control for potential time-specific influences. The results in Model 1 show that environmental performance (EP) has a positive and statistically significant effect on greenwashing practices ($\beta = 0.097$, $p < 0.10$). However, the interaction term between environmental performance and financial performance (EP × ROA) exhibits a negative and significant coefficient ($\beta = -0.295$, $p < 0.10$), indicating that financial performance weakens the positive relationship between environmental performance and greenwashing practices. Financial performance (ROA) itself does not have a significant direct effect on greenwashing.

Table 5. Regression Results

Variables	(1) Model 1	(2) Model 2	(3) Model 3
EP	0.097*	0.078**	0.075**
	(0.052)	(0.030)	(0.033)
ROA	0.018	0.064	0.064
	(0.092)	(0.087)	(0.091)
EP X ROA	-0.295*	-0.399***	-0.387***
	(0.148)	(0.124)	(0.137)
CSR		-0.098	-0.106
		(0.116)	(0.120)
SIZE		-0.009	-0.008
		(0.010)	(0.010)
LEV		2.572	2.636
		(2.038)	(2.039)
2022.year			-0.000
			(0.042)
2023.year			0.013
			(0.041)
Constant	1.126***	1.394***	1.382***
	(0.029)	(0.273)	(0.279)
Observations	108	108	108
R-squared	0.019	0.134	0.135
Controls	No	Yes	Yes
Year FE	No	No	Yes
Clustered SE by Firm	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Processed data (2026)

After introducing the control variables in Model 2, the coefficient of environmental performance remains positive and becomes significant at the 5 percent level ($\beta = 0.078$, $p < 0.05$). The interaction term remains negative and highly significant ($\beta = -0.399$, $p < 0.01$), suggesting that firms with stronger financial performance are less likely to translate environmental activities into symbolic environmental claims. The control variables CSR disclosure, firm size, and leverage do not exhibit statistically significant effects on greenwashing practices.

Model 3 incorporates year fixed effects and reports results that are largely consistent with those of Model 2. Environmental performance continues to have a positive and significant effect on greenwashing practices ($\beta = 0.075$, $p < 0.05$), while the interaction term between environmental performance and financial performance remains negative and statistically significant ($\beta = -0.387$, $p < 0.01$). Neither the year dummy variables nor the control variables are found to be statistically significant. The explanatory power of the model increases from an R-squared value of 0.019 in Model 1 to 0.135 in Model 3, indicating that the inclusion of control variables and year fixed effects improves the model's ability to explain variations in greenwashing practices. All models are estimated using robust standard errors clustered at the firm level to address potential heteroskedasticity and within-firm correlation.

G. Discussion of Research Findings

1) The Effect of Environmental Performance on Greenwashing Practices

Based on the regression results, environmental performance has a positive and statistically significant effect on greenwashing practices. The coefficient of environmental performance is positive and significant at the 5 percent level, indicating that firms with higher environmental performance tend to exhibit higher levels of greenwashing. Therefore, the first hypothesis (H1) is not supported. This finding suggests that environmental performance does not necessarily reduce greenwashing practices; instead, firms that invest more heavily in environmental initiatives may have stronger incentives to communicate their environmental commitment to stakeholders (de Freitas Netto et al., 2020; Lyon & Montgomery, 2015). In highly scrutinized industries such as the energy sector, companies face mounting pressure from regulators, investors, communities, and environmental groups to demonstrate environmental responsibility. As a result, firms with greater environmental activity may be more inclined to emphasize and promote these efforts through sustainability disclosures and corporate communications. In some cases, this tendency may increase the risk of selective disclosure or exaggerated environmental claims, thereby contributing to greenwashing practices (Marquis et al., 2016; Velte, 2023).

This finding is consistent with the perspective that greenwashing arises not only among poor environmental performers but also among firms seeking to enhance their environmental reputation. According to Marquis et al. (2016), firms may strategically disclose environmental information to shape stakeholder perceptions while selectively highlighting favourable environmental achievements. Similarly, Yu et al. (2020) argue that firms with more extensive sustainability disclosures may still engage in greenwashing when the disclosed information does not fully reflect actual environmental performance. Environmental initiatives and environmental communication may therefore coexist with greenwashing behaviour when firms place greater emphasis on symbolic legitimacy than on transparent accountability.

From a stakeholder theory perspective (Freeman, 1984), firms are expected to respond to stakeholder demands for environmental responsibility; however, such responses may take either substantive or symbolic forms. While substantive responses involve genuine environmental improvement, symbolic responses emphasize communication strategies designed to create a favourable environmental image. The positive association observed in this study suggests that environmental performance may provide firms with a stronger basis for constructing environmental narratives, thereby increasing the likelihood of symbolic environmental communication. In this context, environmental performance may function not only as evidence of environmental commitment but also as a resource that supports corporate reputation-building efforts.

This finding is particularly relevant in the energy sector, where environmental issues attract substantial public attention. Firms operating in environmentally sensitive industries often face greater legitimacy pressures and may therefore devote considerable effort to communicating their sustainability achievements (de Freitas Netto et al., 2020; Marquis et al., 2016). Consequently, environmental performance alone should not be interpreted as conclusive evidence of environmental accountability. Stakeholders should also evaluate the quality, completeness, and credibility of sustainability disclosures, as well as the consistency between environmental claims and actual environmental outcomes (Velte, 2022). A critical implication of this finding is that environmental expenditure and environmental initiatives do not automatically guarantee substantive sustainability performance, as environmental investments may be used both to improve environmental outcomes and to support favourable sustainability narratives. Stakeholders should therefore place greater emphasis on measurable environmental outcomes, external verification, and assurance mechanisms when assessing

whether corporate environmental claims reflect genuine environmental performance or merely symbolic communication (Velte, 2022; Malik et al., 2025).

2) The Effect of Financial Performance on Greenwashing Practices

Based on the regression results, financial performance, measured by Return on Assets (ROA), does not have a statistically significant direct effect on greenwashing practices. Therefore, the second hypothesis (H2), which predicts that financial performance has a positive effect on greenwashing practices, is not supported. This finding indicates that firms with higher or lower financial performance do not necessarily differ in their direct tendency to engage in greenwashing. In other words, profitability alone may not be sufficient to explain whether a firm adopts symbolic environmental communication. Although firms with stronger financial performance may possess more resources to support environmental initiatives, this financial capacity does not automatically reduce or increase greenwashing practices (de Freitas Netto et al., 2020; Velte, 2022). From a stakeholder theory perspective, greenwashing may be influenced more by external pressure, legitimacy concerns, governance quality, disclosure incentives, and industry scrutiny than by financial performance alone. In the energy sector, firms face strong environmental expectations regardless of their profitability level; consequently, both financially strong and financially weak firms may have incentives to manage stakeholder perceptions through sustainability-related communication (Marquis et al., 2016; Lyon & Montgomery, 2015).

However, the insignificant direct effect of financial performance should be interpreted with caution, as ROA plays a more substantial role within the interaction model. The regression results show that financial performance significantly moderates the relationship between environmental performance and greenwashing practices. This suggests that financial performance may not directly determine greenwashing but can instead influence how environmental performance translates into greenwashing behavior (Velte, 2022; Malik et al., 2025). Financial performance is therefore better understood as a moderating condition rather than a direct determinant of greenwashing practices. This finding implies that the role of profitability in greenwashing should be analyzed jointly with environmental performance, since the effect of environmental performance on greenwashing may vary depending on a firm's financial capacity.

3) The Effect of Environmental Performance on Greenwashing Practices, Moderated by Financial Performance

Accordingly, the interaction between environmental performance and financial performance has a negative and statistically significant effect on greenwashing practices. This indicates that financial performance moderates the relationship between environmental performance and greenwashing, and therefore the third hypothesis (H3) is supported. The negative coefficient of the interaction term suggests that financial performance weakens the positive relationship between environmental performance and greenwashing practices. In other words, although environmental performance is positively associated with greenwashing, this effect becomes weaker as firms' financial performance strengthens. Firms with higher profitability may possess greater financial resources to support environmental initiatives through more substantive action, stronger reporting systems, and more robust accountability mechanisms (Velte, 2022; Malik et al., 2025). As a result, the risk that environmental activities are used merely as symbolic communication is reduced. This finding suggests that financial performance functions as a boundary condition in the relationship between environmental performance and greenwashing. For firms with weaker financial performance, environmental initiatives may be more vulnerable to being used as legitimacy tools or reputational narratives, as limited resources can restrict firms' ability to fully implement substantive environmental improvements (de Freitas Netto et al., 2020).

Under such conditions, firms may emphasize environmental claims to maintain stakeholder trust even when actual environmental outcomes remain limited.

From a stakeholder theory perspective, firms face pressure to demonstrate environmental responsibility; however, their ability to respond substantively to such pressure depends partly on financial capacity. Financially stronger firms are better able to translate environmental commitments into credible environmental actions and disclosures (Velte, 2022; Malik et al., 2025), whereas financially weaker firms may rely more heavily on symbolic strategies, since substantive environmental improvement requires considerable financial resources. Thus, the moderating role of financial performance offers an important explanation for why environmental performance does not always reduce greenwashing: environmental activities may increase greenwashing when firms use them as a basis for symbolic communication, but this tendency diminishes when firms possess stronger financial performance, as they are better positioned to support environmental claims with actual programs, implementation capacity, and credible sustainability reporting (Velte, 2022; Malik et al., 2025). Overall, this finding suggests that financial performance does not directly determine greenwashing but instead shapes how environmental performance is translated into greenwashing behaviour.

5. Conclusion

This study aimed to examine the influence of environmental performance and financial performance on greenwashing practices, as well as the role of financial performance as a moderating variable in the relationship between environmental performance and greenwashing. Using a sample of energy sector companies listed on the Indonesia Stock Exchange during the 2021 to 2023 period, the findings show that environmental performance has a positive and significant effect on greenwashing practices. This indicates that firms with higher environmental performance tend to exhibit higher levels of greenwashing, suggesting that environmental activities may also be used as a basis for constructing favorable sustainability narratives. Financial performance, measured by Return on Assets (ROA), does not have a significant direct effect on greenwashing, indicating that profitability alone does not determine whether a firm engages in greenwashing. However, financial performance significantly moderates the relationship between environmental performance and greenwashing practices. The negative coefficient of the interaction term indicates that financial performance weakens the positive relationship between environmental performance and greenwashing. In other words, firms with stronger financial performance are better able to support environmental activities through more substantive action and credible sustainability reporting, thereby reducing the extent to which environmental performance translates into greenwashing.

This study is subject to several limitations. First, the sample and observation period are confined to energy sector companies listed on the Indonesia Stock Exchange during the 2021 to 2023 period; consequently, the findings may not fully represent greenwashing practices in other sectors or over a longer time horizon. Second, this study measures environmental performance using environmental spending and measures greenwashing through a ratio-based index. These measurements may be sensitive to the symbolic-substantive scoring process and may not fully capture actual environmental outcomes, such as emission reduction, energy efficiency, or waste management performance.

A further limitation concerns the relatively low explanatory power of the research model. The adjusted R-squared value of 0.13 indicates that environmental performance, financial performance, and their interaction explain only a limited proportion of the variation in greenwashing practices. This result, however, should be interpreted with caution, as greenwashing remains a relatively emerging and exploratory topic, particularly within the context of sustainability accounting and the Indonesian energy sector. At this stage of research development, a low adjusted R-squared remains plausible, since greenwashing may be shaped by various organizational, governance, and external factors not fully captured in the current model.

In light of these limitations, future studies are encouraged to extend the research period and include companies from other sectors to improve the generalizability of the findings. Future research may also incorporate additional variables to enhance the model's explanatory power, such as firm size, leverage, corporate governance mechanisms, ownership structure, audit quality, ESG disclosure quality, and external sustainability assurance. In addition, future studies are encouraged to enrich the measurement of environmental performance and greenwashing by employing output-based environmental indicators, such as emissions, energy efficiency, and waste management, alongside external verification indicators. These refinements may offer a more comprehensive explanation of why firms engage in greenwashing and how sustainability accounting information can better reflect substantive environmental accountability rather than merely symbolic environmental claims.

For practical implications, companies are encouraged to strengthen the transparency and quality of sustainability disclosures by emphasizing substantive evidence over symbolic narratives. This is essential to ensure that sustainability reporting functions not merely as a communication tool, but as a credible accountability mechanism for stakeholders.

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