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The Effect of Profitability and Corporate Governance on Greenwashing in Indonesian Basic Materials Companies

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Abstract

This study examines the effect of profitability and corporate governance mechanisms on greenwashing in Indonesian basic materials companies. Profitability is measured by profit margin, while corporate governance is proxied by board size and board independence. The study uses a quantitative approach with secondary data obtained from annual reports, sustainability reports, ESG reports, financial statements, and official company sources. The sample consists of 55 basic materials companies listed in Indonesia from 2022 to 2025, resulting in 220 firm-year observations. Panel data regression is performed using EViews. The empirical results show that profit margin and board size have negative effects on greenwashing, while board independence has no effect on greenwashing. Firm size and cash flow from operations also show negative effects on greenwashing. This study contributes to the greenwashing literature by providing evidence from an environmentally sensitive sector in an emerging market and by explaining how profitability and board characteristics relate to symbolic sustainability reporting.

Keywords: Greenwashing, Profit Margin, Board Size, Board Independence, Basic Materials

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INTRODUCTION

Sustainability reporting has become an important instrument for companies to communicate environmental, social, and governance responsibilities to stakeholders. However, the expansion of sustainability reporting also creates a risk of greenwashing, which occurs when companies present a sustainability image that is more positive than their actual environmental actions or performance. Greenwashing may appear through selective disclosure, general narratives, unsupported claims, or inconsistencies between sustainability communication and substantive corporate actions (Janik & Ryszko, 2026; Sneideriene & Legenzova, 2025).

Greenwashing is a relevant issue because sustainability information is used by investors, regulators, creditors, consumers, and society to evaluate corporate commitment to sustainability. When this information does not reflect actual conditions, stakeholders may make decisions based on misleading signals. In sustainability reporting, disclosure quality is not only reflected in the amount of information disclosed, but also in the connection between disclosure, performance, innovation, and environmental responsibility (Liu et al., 2023). Therefore, the quality of sustainability disclosure is important to distinguish substantive commitment from merely symbolic communication.

The basic materials sector is important to examine because its operations are closely related to natural resource use, raw material processing, emissions, waste, and high environmental impact. Companies in this sector face stronger pressure to show sustainability commitment to the public. This pressure can encourage substantive sustainability disclosure, but it can also create an opportunity for greenwashing when disclosure is directed more toward image building than toward reporting real sustainability practices (Montgomery et al., 2024; de Freitas Netto et al., 2020).

Profitability is one internal factor that can affect the tendency to engage in greenwashing. Companies with higher profitability have greater resources to implement real environmental programs, which may reduce greenwashing. At the same time, profitable companies may also strengthen their sustainability image to maintain legitimacy and market trust. Therefore, the relationship between profitability and greenwashing still needs empirical testing, especially in sectors with high environmental exposure (Delmas & Burbano, 2011; Lee & Raschke, 2023).

Corporate governance mechanisms also play an important role in monitoring the quality of sustainability disclosure. Board size may influence monitoring effectiveness because a larger board can provide broader perspectives, expertise, and oversight capacity. However, a board that is too large may create coordination problems and slow decision

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making. Board independence is also important because independent commissioners are expected to provide objective oversight, reduce conflicts of interest, and limit opportunistic disclosure practices (Birindelli et al., 2024; Ma & Ahmad, 2024). Independent commissioners strengthen corporate supervision because they are not affiliated with management or controlling shareholders. Their presence may reduce agency conflict and align managerial decisions with stakeholder interests (Suri & Aryati, 2026).

Prior studies have examined greenwashing, sustainability reporting quality, and the relationship between corporate governance and ESG disclosure. Nevertheless, research gaps remain. First, many studies position greenwashing as a consequence of corporate communication strategy rather than as a dependent variable explained by profitability and governance mechanisms. Second, empirical evidence on the effects of board size and board independence on greenwashing is still mixed. Third, evidence from Indonesian basic materials companies is limited, even though this sector has strong environmental characteristics and is highly relevant to greenwashing research (Solikhah, 2026; Ghitti et al., 2024).

Based on these gaps, this study aims to examine the effects of profit margin, board size, and board independence on greenwashing in Indonesian basic materials companies. Firm size and cash flow from operations are included as control variables to reduce potential bias from company characteristics. The contribution of this study is to strengthen empirical evidence on greenwashing determinants in an emerging market context and to explain how profitability and board structure may reduce or encourage symbolic sustainability reporting.

THEORETICAL REVIEW

Legitimacy theory explains that companies seek social acceptance by aligning corporate activities and disclosure with societal expectations. In environmentally sensitive sectors, companies face strong legitimacy pressure because their operations may generate visible environmental impacts. Sustainability reporting can become a tool to maintain legitimacy. However, when disclosure is dominated by broad claims and is not supported by measurable programs or achievements, it may become a symbolic strategy that increases greenwashing.

Agency theory explains the conflict of interest between managers and stakeholders. Managers may use sustainability disclosure to protect reputation, reduce external pressure, or improve corporate image even when the disclosure is not supported by substantive actions. Corporate governance mechanisms are expected to reduce this agency problem by improving monitoring and limiting opportunistic reporting. Board size and board

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independence are therefore relevant mechanisms for assessing whether governance can reduce greenwashing.

The study tests three main hypotheses. Profit margin is expected to have a negative effect on greenwashing because profitable companies have more resources to support substantive sustainability programs. Board size is expected to have a negative effect on greenwashing because a larger board may improve monitoring capacity. Board independence is also expected to have a negative effect on greenwashing because independent commissioners are expected to provide objective oversight of sustainability disclosure quality.

METHOD

Research Design

This study uses a quantitative approach because it examines relationships among variables using numerical data and statistical testing. The object of the study is companies in the basic materials sector in Indonesia. The data are secondary data obtained from annual reports, sustainability reports, ESG reports, financial statements, and official company sources. The observation period covers 2022 to 2025.

Population and Sample

The population consists of basic materials companies listed in Indonesia during the observation period. The sample is selected using purposive sampling based on the availability of annual reports, sustainability reports or ESG reports, complete financial data, and information on the board of commissioners. Based on these criteria, the final sample consists of 55 companies with 220 firm-year observations.

Data Analysis

The analytical method is panel data regression using EViews. Panel regression is appropriate because the data combine time-series and cross-section dimensions. Model selection is performed using the Chow test, Hausman test, and Lagrange Multiplier test to determine the most appropriate model among the Common Effect Model, Fixed Effect Model, and Random Effect Model. Hypothesis testing in this study uses the Random Effect Model based on the final panel regression output.

Variables and Measurement

The research model is specified as follows:

$$GWit = \alpha + \beta 1PMit + \beta 2BSIZEit + \beta 3BINDit + \beta 4SIZEit + \beta 5CFOit + \varepsilon it$$

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GW represents greenwashing, PM represents profit margin, BSIZE represents board size, BIND represents board independence, SIZE represents firm size, and CFO represents cash flow from operations. The symbol α represents the constant, β represents the regression coefficient, ε represents the error term, i represents the company, and t represents the year of observation.

Greenwashing is measured using the GreenIndex, which is the ratio of symbolic disclosure to substantive disclosure. Symbolic disclosure refers to general sustainability claims, narrative statements, or disclosures not supported by concrete evidence. Substantive disclosure refers to sustainability disclosure supported by evidence, data, targets, programs, achievements, or real corporate actions. The GreenIndex formula is as follows:

GreenIndex = Symbolic / (Substantive + 1)

The addition of 1 to the substantive component is used to avoid division by zero. A higher GreenIndex indicates a higher tendency toward greenwashing because symbolic disclosure is more dominant than substantive disclosure. Profit margin is measured by net income divided by net sales. Board size is measured by the number of board commissioners. Board independence is measured by the number of independent commissioners divided by the total board of commissioners. Firm size is measured by the natural logarithm of total assets. CFO is measured by operating cash flow divided by total assets.

RESULTS

Descriptive Statistics

Descriptive statistics provide an overview of the data characteristics. The mean value of greenwashing is 0.939772 with a standard deviation of 0.946673, indicating that greenwashing levels vary across companies. Profit margin has a negative mean value of -0.988864 and a median value of 0.042536, indicating the presence of companies with very low profit margins during the observation period. Board size has a mean value of 3.663636, while board independence has a mean value of 0.429075. Firm size has a mean value of 28.177070 and CFO has a mean value of 0.060854.

Table 1: Descriptive Statistics

Variable	Mean	Median	Minimum	Maximum	Std. Dev.
GW	0.939772	0.642857	0.000000	4.750000	0.946673
PM_W	-0.988864	0.042536	-75.791510	0.564498	8.816620

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BSIZE	3.663636	3.000000	2.000000	9.000000	1.640121
BIND	0.429075	0.375000	0.200000	0.750000	0.120967
SIZE_W	28.177070	28.245810	24.476930	31.947560	1.756379
CFO_W	0.060854	0.061397	-0.169482	0.282462	0.082216

Panel Data Model Selection and Multicollinearity Test

Panel model selection is performed using the Chow test and Hausman test. The Chow test shows a cross-section F probability of 0.0000 and a cross-section chi-square probability of 0.0000. These values are below 0.05, indicating that the Fixed Effect Model is more appropriate than the Common Effect Model. The Hausman test shows a cross-section random probability of 1.0000, indicating that the Random Effect Model is more appropriate than the Fixed Effect Model. However, the Hausman output also notes that the cross-section test variance is invalid and the Hausman statistic is set to zero. Therefore, the Hausman result should be interpreted carefully. Based on the available final output, this study uses the Random Effect Model for hypothesis testing.

The multicollinearity test is conducted using the correlation matrix among independent variables. The highest correlation is found between BSIZE and SIZE_W at 0.501771. This value is below 0.80, indicating that there is no strong multicollinearity problem in the research model.

Hypothesis Testing

Hypothesis testing is conducted using the Random Effect Model. The regression results show that profit margin has a negative coefficient of -0.004216 with a probability value of 0.0000. Board size has a negative coefficient of -0.053185 with a probability value of 0.0832. Board independence has a positive coefficient of 0.019365 with a probability value of 0.9444. Firm size has a negative coefficient of -0.252035 with a probability value of 0.0000, while CFO has a negative coefficient of -0.505102 with a probability value of 0.0965. The adjusted R-squared value is 0.141982, indicating that the variables in the model explain 14.1982 percent of the variation in greenwashing. The Prob(F-statistic) value of 0.0000 indicates that the regression model is statistically significant simultaneously.

Table 2: Panel Data Regression Results

Variable	Coefficient	Probabil-ity	Decision
C	8.254498	0.0000	Significant
PM_W	-0.004216	0.0000	Significant negative
BSIZE	-0.053185	0.0832	Significant negative at 10%

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BIND	0.019365	0.9444	Not significant
SIZE_W	-0.252035	0.0000	Significant negative
CFO_W	-0.505102	0.0965	Significant negative at 10%

The R-squared value is 0.161572 and the adjusted R-squared value is 0.141982. The F-statistic is 8.247908 with a probability value of 0.0000. Therefore, the regression model is considered appropriate for explaining the effects of profitability, corporate governance, firm size, and CFO on greenwashing.

DISCUSSION

The results show that profit margin has a negative effect on greenwashing. This finding indicates that companies with higher profitability tend to have lower greenwashing levels. Theoretically, this relationship can be explained by legitimacy theory and agency theory. More profitable companies have greater resources to implement substantive sustainability activities, so they do not need to rely only on symbolic claims in sustainability reports. Higher profitability may also reduce managerial pressure to create a sustainability image that is not aligned with actual corporate conditions.

The results also show that board size has a negative effect on greenwashing. This finding indicates that a larger board of commissioners is associated with a lower tendency to engage in greenwashing. A larger board may strengthen oversight because it provides more perspectives, experience, and monitoring capacity in evaluating corporate policies, including sustainability disclosure. With broader supervision, companies tend to be more cautious in presenting sustainability claims that are not supported by real actions.

Board independence has no effect on greenwashing. This finding indicates that the presence of independent commissioners does not necessarily reduce greenwashing in basic materials companies. In theory, independent commissioners are expected to improve the objectivity of oversight. However, monitoring effectiveness is not determined only by the proportion of independent commissioners. It also depends on competence, involvement, access to information, and the ability of the board to evaluate the quality of sustainability disclosure. Therefore, structural independence does not always reflect effective oversight of symbolic sustainability reporting.

Firm size has a negative effect on greenwashing. This finding indicates that larger companies tend to have lower greenwashing levels. Larger companies generally have stronger resources, reporting systems, and public pressure to provide credible sustainability information. They also receive more attention from investors, regulators,

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media, and the public. This reputational exposure may encourage companies to reduce disclosure that is only symbolic.

CFO has a negative effect on greenwashing. This finding indicates that companies with stronger operating cash flow tend to have lower greenwashing levels. CFO reflects the internal ability of a company to finance operational activities and sustainability programs. Companies with adequate operating cash flow have more flexibility to implement real environmental programs, so their sustainability disclosure is more likely to be substantive rather than symbolic.

CONCLUSION

This study finds that profit margin and board size negatively affect greenwashing in Indonesian basic materials companies. Board independence does not affect greenwashing. The control variables, firm size and CFO, also show negative effects on greenwashing. These results indicate that profitability, the size of the board of commissioners, company size, and operating cash flow capacity play roles in reducing symbolic sustainability reporting.

The theoretical implication of this study is that it strengthens the application of legitimacy theory and agency theory in explaining greenwashing. The findings show that greenwashing is not only related to corporate communication strategy, but also to financial condition and corporate monitoring mechanisms. The practical implication is that companies need to improve the quality of sustainability reporting so that disclosure is not merely narrative, but is supported by evidence, data, targets, programs, and measurable achievements.

This study has limitations. First, it uses secondary data that depend on the availability of annual reports, sustainability reports, ESG reports, and financial statements. Second, greenwashing measurement through the GreenIndex requires careful content analysis so that symbolic and substantive disclosures can be classified consistently. Future research can add other governance mechanisms, such as audit committee characteristics, board expertise, institutional ownership, or sustainability report assurance. Future studies can also compare the basic materials sector with other sectors that have high environmental risk.

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