



Does Corporate Governance Really Curb Greenwashing? The Moderating Role of ESG Report Assurance in Indonesia

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Abstract

This study examines the effects of the Audit Committee, CEO equity compensation, and board gender diversity on greenwashing, while investigating the moderating role of ESG report assurance. Using purposive sampling, a balanced panel dataset of 26 manufacturing firms (130 observations) listed on the Indonesia Stock Exchange from 2020 to 2024 was analyzed using panel data regression. The results show that the Audit Committee has a significant positive effect on greenwashing, whereas CEO equity compensation and board gender diversity have no significant effects. Furthermore, ESG report assurance does not moderate the effects of the Audit Committee or CEO equity compensation, but it significantly strengthens the negative relationship between board gender diversity and greenwashing. This research contributes to the greenwashing literature by providing empirical evidence on the role of corporate governance and assurance mechanisms within the Indonesian manufacturing sector.

Keywords: *Audit Committee, Board Gender Diversity, CEO Equity Compensation, ESG Report Assurance, Greenwashing.*

Abstrak

Penelitian ini menganalisis pengaruh Audit Committee, CEO equity compensation, dan board gender diversity terhadap greenwashing serta menguji peran moderasi ESG report assurance. Menggunakan purposive sampling, data panel dari 26 perusahaan manufaktur (130 observasi) yang terdaftar di Bursa Efek Indonesia periode 2020 hingga 2024 dianalisis dengan regresi data panel. Hasil penelitian menunjukkan bahwa Audit Committee berpengaruh positif dan signifikan terhadap greenwashing, sedangkan CEO equity compensation dan board gender diversity tidak berpengaruh signifikan. Lebih lanjut, ESG report assurance tidak memoderasi pengaruh Audit Committee atau CEO equity compensation, namun secara signifikan memperkuat hubungan negatif antara board gender diversity dan greenwashing. Penelitian ini memperluas literatur greenwashing dengan memberikan bukti empiris mengenai peran tata kelola perusahaan dan mekanisme assurance pada sektor manufaktur di Indonesia.

Kata Kunci: *Audit Committee, Board Gender Diversity, CEO Equity Compensation, ESG Report Assurance, Greenwashing*

1. INTRODUCTION

Amid growing global challenges related to climate change, Environmental, Social, and Governance (ESG) practices have become a major focus of stakeholders and regulators worldwide (Battisti et al., 2025; Hidayah & Ratmono, 2025; Ling et al., 2025). In this context, sustainability reporting and ESG ratings serve as important metrics for assessing corporate environmental commitments (Battisti et al., 2025). However, the rapid expansion of ESG disclosure has been accompanied by growing concerns regarding data credibility, contributing to the emergence of greenwashing practices (Abdullah et al., 2025; Fang et al., 2025; Solikhah, 2026). Greenwashing refers to the manipulation of information or the creation of a misleading corporate image to portray a company as more environmentally responsible than it actually is (S. Li & Liu, 2025). In Indonesia, this issue has become increasingly relevant amid growing demands for sustainability transparency and accountability (Hidayah & Ratmono, 2025). These demands are reinforced by the Financial Services Authority (Otoritas Jasa Keuangan/OJK), which issued Regulation No. 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies to promote environmental accountability (OJK, 2017).

Despite strengthened regulations, the gap between corporate claims (green talk) and actual environmental actions (green walk) remains a persistent concern (Xing et al., 2025). Many firms tend to use ESG disclosure symbolically to enhance their corporate image, attract investor interest, and avoid regulatory sanctions without undertaking corresponding operational changes (Hidayah & Ratmono, 2025; Ma & Ahmad, 2024). For instance, Hidayah & Ratmono (2025) identify indications of greenwashing among mining companies in Indonesia, a sector characterized by substantial environmental impacts. Beyond the mining sector, the manufacturing sector is also environmentally sensitive, as its production activities generate substantial emissions and hazardous waste that can affect ecosystems and local communities, making it a relevant context for examining environmental disclosure and transparency (Prihandono & S. Yuniarti, 2023; Wahyuningrum et al., 2026). This condition reflects the practice of decoupling, which refers to a misalignment between external disclosures and internal corporate activities (Fang et al., 2025; Feng et al., 2025; S. Li & Liu, 2025; Solikhah, 2026). Such cosmetic sustainability reporting practices may ultimately erode public trust, distort the development of green capital markets, and undermine long-term sustainable development objectives (Hidayah & Ratmono, 2025; Wang et al., 2025).

This issue highlights the importance of corporate governance mechanisms that ensure ESG information more accurately reflects firms' substantive conditions. However, prior research on the relationship between corporate governance and greenwashing has produced mixed findings (Battisti et al., 2025; Hidayah & Ratmono, 2025; Ma & Ahmad, 2024). Existing studies on corporate governance and greenwashing have predominantly focused on developed economies with relatively stringent oversight, whereas evidence from emerging economies such as Indonesia, where regulatory enforcement remains uneven, is still limited (Ma & Ahmad, 2024; Xiong et al., 2025). This context makes ESG report assurance particularly important in Indonesia. Under Regulation No. 51/POJK.03/2017, issuers and public companies are required to prepare sustainability reports, while independent assurance of sustainability reports remains a voluntary practice among Indonesian companies (Meutia et al., 2022; OJK, 2017). This voluntary nature raises an important question of whether ESG report assurance

serves as a substantive mechanism for mitigating greenwashing by enhancing the credibility of ESG information or merely functions as a symbolic legitimacy buffer that strengthens corporate reputation without addressing underlying ESG performance gaps, potentially creating opportunities for opinion shopping. Accordingly, the effectiveness of third-party verification remains subject to academic debate (Bu et al., 2024; Nepal et al., 2025; Solikhah, 2026; Xing et al., 2025). Some studies demonstrate that external assurance can enhance the credibility and reliability of sustainability reporting (Xing et al., 2025). However, other perspectives caution that firms may use assurance services merely as a reputational buffer or symbolic credibility mechanism, enabling them to justify opinion shopping without reducing opportunistic behavior (Solikhah, 2026; Xing et al., 2025).

From the perspective of legitimacy theory, environmental disclosure serves as a strategic instrument through which firms seek to obtain, maintain, or restore social legitimacy by aligning their activities with societal expectations (Cao et al., 2025; Rahmatullah & Wahyuningrum, 2025; Zhang et al., 2025). When firms face pressure to demonstrate environmental responsibility, they may respond symbolically by emphasizing favorable environmental information without making corresponding improvements in actual environmental performance (Huang et al., 2022; Pinheiro et al., 2025). Such practices can result in greenwashing, as the gap between environmental disclosure and actual performance enables firms to pursue cosmetic legitimacy while potentially undermining corporate credibility once the discrepancy is identified (Feng et al., 2025; Wang et al., 2025).

The theoretical and empirical inconsistencies are also evident in the effects of selected corporate governance mechanisms on greenwashing. Although the Audit Committee, CEO equity compensation, and board gender diversity are generally expected to strengthen monitoring and discourage opportunistic environmental disclosure, prior evidence shows that their effects may vary across institutional contexts (Hidayah & Ratmono, 2025; K. Li et al., 2024; W. Li et al., 2025; Liu, 2024; Nepal et al., 2025; Nurhandika et al., 2025). Such inconsistencies may be particularly relevant in emerging markets such as Indonesia, where differences in regulatory enforcement, environmental oversight, and governance effectiveness may influence how internal governance mechanisms translate into substantive ESG practices. These conditions suggest that internal governance mechanisms alone may not be sufficient to prevent greenwashing, creating a need for complementary external monitoring mechanisms. Accordingly, ESG Report Assurance is introduced as a moderating variable to examine whether independent verification can strengthen the effectiveness of corporate governance mechanisms in mitigating greenwashing (Xing et al., 2025).

Against these theoretical and empirical gaps, this study aims to empirically examine the effects of internal corporate governance mechanisms, namely the Audit Committee, CEO equity compensation, and Board gender diversity, on greenwashing in Indonesia. In addition, this study investigates the moderating role of ESG report assurance in strengthening or weakening the effects of these internal governance mechanisms on greenwashing. By addressing these relationships, this study seeks to provide relevant policy implications for Indonesian regulators, particularly the Financial Services Authority (Otoritas Jasa Keuangan/OJK), in developing guidelines for substantive sustainability report assurance, reducing cosmetic environmental disclosure, and enhancing the integrity of green financial markets (Battisti et al., 2025; Bu et al., 2024; Hidayah & Ratmono, 2025).

2. LITERATURE REVIEW AND HYPOTHESES FORMULATION

Legitimacy Theory

Legitimacy theory is one of the dominant perspectives in the literature on sustainability accounting and ESG disclosure (Del Gesso & Lodhi, 2024). The theory posits that firms operate within a social environment shaped by societal norms, values, and expectations and therefore need to align their activities and disclosures with these expectations to maintain legitimacy (Suchman, 1995). In the context of ESG, sustainability disclosure serves as a strategic instrument through which firms communicate their alignment with prevailing environmental and social expectations among stakeholders (Fabrizi et al., 2014; Macuda & Zieniuk, 2024; Pinheiro et al., 2025). As stakeholder demands increase, firms may respond either substantively through improvements in actual ESG performance or symbolically by emphasizing favorable ESG information without corresponding improvements in underlying performance. Such symbolic responses may create a gap between ESG disclosure and actual ESG performance, which provides an important basis for understanding greenwashing. This issue can also be explained through agency theory, as managers generally have greater access to information about a firm's actual ESG performance than shareholders and other external stakeholders. This information asymmetry may create opportunities for managers to selectively disclose favorable ESG information or conceal unfavorable environmental outcomes to protect their own interests (Eisenhardt, 1989; Jensen & Meckling, 1976). Corporate governance mechanisms and ESG report assurance may therefore help constrain managerial opportunism by strengthening monitoring and improving the credibility of ESG information. Thus, legitimacy theory provides the overarching rationale for why firms seek credible ESG disclosure and why governance and verification mechanisms may be needed to maintain social legitimacy.

The Audit Committee and Greenwashing

The Audit Committee represents an internal monitoring mechanism responsible for overseeing both financial and non-financial information, including corporate sustainability disclosures and related issues (Bacha et al., 2020; Pozzoli et al., 2022). Its effectiveness depends not only on its existence or level of activity but also on the quality and substance of its oversight, including members' independence, expertise, and ability to scrutinize relevant reporting issues (Pozzoli et al., 2022; Zaman et al., 2021). Ideally, these characteristics strengthen oversight of corporate reporting practices and encourage higher-quality and more transparent ESG information (Arif et al., 2021; Buallay & Al-Ajmi, 2019). In particular, a higher meeting frequency does not necessarily indicate more effective ESG oversight when meeting agendas are predominantly focused on conventional financial reporting and regulatory compliance rather than environmental risks and the substantive verification of sustainability claims. In the Indonesian context, frequent the Audit Committee meetings may also reflect compliance with formal corporate governance requirements without necessarily translating into substantive oversight of environmental disclosures. This may create a situation in which meeting intensity becomes a symbolic governance practice that enhances the appearance of oversight while leaving cosmetic environmental claims insufficiently scrutinized. Such a condition is consistent with the legitimacy perspective, in which formal governance structures may be maintained to demonstrate conformity with institutional expectations without

necessarily producing substantive changes in corporate practices. Hidayah & Ratmono (2025) provide empirical support for this possibility, finding that the Audit Committee meeting intensity has a positive and significant effect on greenwashing among Indonesian mining companies and highlighting the need for greater forensic expertise to detect greenwashing. In contrast, Nurhandika et al. (2025) show that the Audit Committee independence can strengthen ESG oversight and transparency in the ASEAN-5 context. These divergent findings suggest that the Audit Committee meeting frequency alone may not adequately capture the substantive effectiveness of ESG oversight. Therefore, this study specifically examines the Audit Committee meeting frequency as a measure of meeting intensity rather than as a direct measure of the the Audit Committee's overall effectiveness, competence, or independence. Accordingly, the first hypothesis is formulated as follows:

H1: The Audit Committee meeting frequency has a positive and significant effect on greenwashing.

CEO Equity Compensation and Greenwashing

Managerial behavior in preparing sustainability reports is also influenced by the incentive structures embedded in CEO compensation schemes (Enache et al., 2025). From the perspective of agency theory, CEO equity compensation is intended to align managerial interests with those of shareholders by linking CEO wealth to firm value, potentially discouraging opportunistic behavior that could damage long-term firm value. However, the effectiveness of such incentives may be limited in emerging markets such as Indonesia, where the economic consequences of environmental violations may remain relatively weak, reducing the deterrent effect of greenwashing. Moreover, greenwashing is more difficult to detect than conventional financial reporting fraud because environmental claims involve complex non-financial information and often require specialized expertise and verification. This information asymmetry may allow CEOs to use favorable ESG disclosures to support short-term stock valuations while facing limited immediate costs when misleading claims remain undetected. Nevertheless, CEO equity ownership may still encourage managers to consider the long-term economic and reputational consequences of greenwashing exposure (Fabrizi et al., 2014; K. Li et al., 2024). Consistent with this argument, K. Li et al. (2024) find that CEO equity compensation has a negative and significant effect on ESG greenwashing, while Zeng et al. (2023) and Wu et al. (2022) show that equity-based incentives can promote a stronger sustainability orientation within firms. These competing arguments suggest that the effect of CEO equity compensation on greenwashing may be context-dependent. Accordingly, higher levels of CEO equity compensation are expected to be associated with lower levels of greenwashing. Based on this reasoning, the second hypothesis is formulated as follows:

H2: CEO equity compensation has a significant negative effect on greenwashing.

Board Gender Diversity and Greenwashing

Board gender diversity represents an important internal governance mechanism that can promote ethical oversight and corporate social responsibility (Ayoko, 2020). From the perspective of legitimacy theory, female directors are generally characterized by greater ethical sensitivity, more open communication, and stronger risk aversion than their male counterparts (Atif et al., 2021; Dănescu & Popa, 2022; Kong et al., 2023). These characteristics may

encourage firms to pursue substantive legitimacy by aligning actual environmental practices with their public ESG commitments rather than relying on symbolic disclosure or cosmetic strategies (Liu, 2024; Mao et al., 2023). Rather than functioning merely as symbolic or token representation, the presence of female directors may strengthen board scrutiny of environmental and reputational risks, particularly because exposure of Greenwashing can undermine corporate credibility and legitimacy over the long term (Jin et al., 2023). Consequently, female directors may be less inclined to tolerate cosmetic environmental strategies that create short-term reputational benefits but expose firms to greater legitimacy risks if detected. Empirical evidence from Ma & Ahmad (2024) confirms that the proportion of women on corporate boards has a significant negative effect on greenwashing among publicly listed firms in China. This finding is consistent with Nepal et al. (2025) and Liu (2024), who demonstrate that gender-diverse boards can significantly constrain misleading green signals and decoupling practices in sustainability reporting. Although female board representation may sometimes be perceived as tokenistic in emerging markets, greater female representation can nevertheless provide substantive monitoring that discourages opportunistic ESG disclosure. Therefore, the third hypothesis is formulated as follows:

H₃: Board gender diversity has a significant negative effect on greenwashing.

The Moderating Role of ESG Report Assurance on the Relationship Between the Audit Committee and Greenwashing

Although internal governance mechanisms are designed to constrain managerial opportunism, their effectiveness may be limited in emerging markets because of insufficient independent oversight of non-financial reporting (Nurhandika et al., 2025). Under these circumstances, independent third-party verification through ESG report assurance can serve as an external governance mechanism that reduces information asymmetry and enhances the credibility of firms disclosed environmental information (Ballou et al., 2018). When the effectiveness of the Audit Committee in overseeing ESG reporting is limited, credible ESG assurance can provide objective verification to identify inconsistencies and constrain the manipulation of reported information (Ballou et al., 2018; Macuda & Zieniuk, 2024; Pflugrath et al., 2011). Such external verification encourages greater alignment between non-financial information and firms' underlying operational conditions, thereby reducing the scope for greenwashing (Bu et al., 2024; Macuda & Zieniuk, 2024). However, ESG report assurance may also create an unintended substitution effect in which Audit Committees perceive non-financial reporting oversight as having been partially delegated to external assurance providers. When ESG disclosures already carry an external assurance statement, Audit Committees may place less emphasis on conducting in-depth discussions of environmental risks and the substance of sustainability claims during their internal meetings. Consequently, external assurance may not necessarily strengthen the monitoring function of Audit Committee meeting intensity and may instead weaken the extent to which frequent meetings translate into substantive ESG oversight. From the perspective of legitimacy theory, the presence of an external assurance statement may provide a formal signal of credibility without necessarily strengthening the substantive internal monitoring required to prevent symbolic ESG disclosure. Accordingly, ESG report assurance is expected to weaken the positive relationship between the Audit Committee meeting

frequency and greenwashing. Based on this reasoning, the fourth hypothesis is formulated as follows:

H4: ESG report assurance mitigates (weakens) the positive effect of the Audit Committee on greenwashing.

The Moderating Role of ESG Report Assurance on the Relationship Between CEO Equity Compensation and Greenwashing

Independent third-party verification through ESG report assurance may enhance the effectiveness of long-term executive compensation schemes by increasing the credibility of sustainability information. When sustainability reports undergo external verification, CEOs with equity-based incentives may face greater reputational and market consequences if discrepancies between reported information and actual environmental performance are identified. Accordingly, ESG report assurance is expected to strengthen the negative effect of CEO equity compensation on greenwashing by increasing credibility-based disciplinary pressure. However, the effectiveness of ESG report assurance may depend on the scope and independence of the assurance process. Xing et al. (2025) highlight the potential for opinion shopping in sustainability assurance, whereby firms may strategically select assurance arrangements that are less likely to challenge unfavorable sustainability information. This concern may be particularly relevant in Indonesia, where sustainability report assurance remains largely voluntary (Meutia et al., 2022). CEOs with high equity incentives may therefore use third-party assurance as a reputational buffer while limiting the assurance scope, allowing potential decoupling practices to remain insufficiently scrutinized. Under such circumstances, the presence of an assurance statement may enhance the perceived credibility of ESG reporting without necessarily constraining the underlying incentives for greenwashing. Therefore, although ESG report assurance is theoretically expected to reinforce the negative relationship between CEO equity compensation and greenwashing, its effectiveness may be limited when assurance functions primarily as a symbolic legitimacy mechanism. Based on this reasoning, the fifth hypothesis is formulated as follows:

H5: ESG report assurance reinforces (strengthens) the negative effect of CEO equity compensation on greenwashing.

The Moderating Role of ESG Report Assurance on the Relationship Between Board Gender Diversity and Greenwashing

Finally, third-party ESG report assurance may strengthen the negative relationship between board gender diversity and greenwashing by providing objectively verified information that supports board oversight. Although female directors may be more attentive to ethical, social, and reputational risks associated with greenwashing, their ability to challenge managerial disclosure practices may be constrained by information asymmetry and limited influence in strategic decision-making (Walsh & Murphy, 2025). In this context, ESG report assurance can provide technical leverage by supplying independently verified evidence that enables female directors to more effectively scrutinize the consistency between ESG disclosures and firms' underlying conditions (Ballou et al., 2018; Pflugrath et al., 2011). Access to more credible and verifiable information may strengthen their ability to challenge symbolic disclosure and pressure management toward more substantive ESG practices. The combination

of internal oversight through board gender diversity and external verification through ESG report assurance therefore creates a governance synergy in which ethical oversight is supported by objective evidence, strengthening firms' ability to address greenwashing and achieve substantive legitimacy (Solikhah, 2026). Accordingly, ESG report assurance is expected to reinforce the negative effect of board gender diversity on greenwashing by enhancing the capacity of gender-diverse boards to exercise substantive ESG oversight. Based on this reasoning, the sixth hypothesis is formulated as follows:

H₆: ESG report assurance reinforces (strengthens) the negative effect of board gender diversity on greenwashing.

3. RESEARCH METHODS

This study focuses on manufacturing firms listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. Manufacturing firms were selected because their operations and production processes are closely linked to resource consumption and environmental issues, making ESG disclosure in this sector particularly relevant for examining potential greenwashing through the gap between firms' ESG disclosures and ESG performance. The initial sample comprised 926 firms with ESG data available in the Refinitiv and Bloomberg databases. Based on the purposive sampling technique and the criteria presented in Table 1, 653 non-manufacturing firms and 247 manufacturing firms with incomplete ESG data were excluded from the sample. Consequently, 26 firms were retained as the final sample, yielding 130 firm-year observations over the five-year observation period. This study examines greenwashing as the dependent variable; Audit Committee, CEO equity compensation, and board gender diversity as the independent variables; and ESG report assurance as the moderating variable. Greenwashing is measured as the difference between standardized ESG disclosure and standardized ESG performance, following D. Zhang (2022). ESG disclosure is measured using the Bloomberg ESG disclosure score, while ESG performance is measured using the Refinitiv ESG performance score. Standardization is applied to improve comparability between the two measures because they are obtained from different ESG data providers with distinct scoring methodologies and distributions. The Audit Committee is measured by the frequency of Audit Committee meetings; CEO equity compensation is measured by the number of shares owned by the CEO multiplied by the average share price; board gender diversity is measured by the proportion of female directors on the board; and ESG report assurance is measured using a dummy variable. The definitions and measurements of all variables are presented in Table 2.

Table 1. Sample Selection Process

Sample Criteria	Total
Firms listed on the Indonesia Stock Exchange (IDX) with ESG data available in the Refinitiv and Bloomberg databases for the 2020–2024 period	926
Excluded: Non-manufacturing firms	(653)
Excluded: Lack of ESG data	(247)
Final sample of firms	26
Total data for the 5-year research period (26 × 5)	130

This study employs panel data regression using EViews. The analysis begins with descriptive statistics and panel model selection using the Chow, Hausman, and Lagrange

Multiplier (LM) tests, followed by diagnostic tests and panel data regression analysis. Hypotheses are tested using the t-test, while the explanatory power of the models is assessed based on the R-squared (R^2) value. The analysis was conducted using panel data regression with two models: a baseline model and a moderation model incorporating interaction terms. The following equations are employed to test the first three hypotheses and examine the moderating effects of ESG report assurance:

$$GW_{it} = a + \beta_1 AC_{it} + \beta_2 CEC_{it} + \beta_3 BGD_{it} + e \dots\dots\dots (1)$$

Where (GW) represents Greenwashing, (AC) represents Audit Committee, (CEC) represents CEO Equity Compensation, (BGD) represents Board Gender Diversity, and (ESGA) represents ESG Report Assurance. The subscripts (i) and (t) denote firm (i) and year (t), respectively. To test Hypotheses 4–6, the following moderation model is employed:

$$GW_{it} = a + \beta_1 AC_{it} + \beta_2 CEC_{it} + \beta_3 BGD_{it} + \beta_4 ESGA_{it} + \beta_5 AC * ESGA_{it} + \beta_6 CEC * ESGA_{it} + \beta_7 BGD * ESGA_{it} + e \dots\dots\dots (2)$$

Table 2. Operational Variable

Variable	Definition	Measurement
Greenwashing (Y)	Greenwashing refers to the discrepancy between a firm's ESG disclosure and its underlying ESG performance, where a larger positive gap indicates a higher level of Greenwashing (D. Zhang, 2022).	$GW_{i,t} = \left(\frac{ESGdis_{i,t} - \overline{ESGdis}}{\sigma_{dis}} \right) - \left(\frac{ESGper_{i,t} - \overline{ESGper}}{\sigma_{per}} \right)$ <p>ESG disclosure is measured using the Bloomberg ESG disclosure score, while ESG performance is measured using the Refinitiv ESG performance score. Each score is standardized using its respective sample mean and standard deviation before calculating the difference. A larger positive difference indicates a higher level of Greenwashing (D. Zhang, 2022).</p>
Audit Committee (X1)	The Audit Committee refers to a committee that assists the board of commissioners in overseeing financial and sustainability reporting processes and enhancing corporate transparency and internal control (Hidayah & Ratmono, 2025).	Measured by the number of Audit Committee meetings held during a year (Hidayah & Ratmono, 2025).

Variable		Definition	Measurement
CEO Compensation (X2)	Equity	CEO equity compensation refers to equity-based compensation associated with the CEO's ownership interest in the firm (K. Li et al., 2024).	Number of shares owned by the CEO $\times$ average month-end share price during the year (K. Li et al., 2024).
Board Diversity (X3)	Gender	Board gender diversity refers to the degree of gender diversity within the board of directors, reflecting the participation of women in the firm's strategic decision-making (Ma & Ahmad, 2024).	$BGD = \frac{\text{Number of female directors}}{\text{Total number of directors}}$ (Ma & Ahmad, 2024).
ESG Assurance (Z)	Report	ESG report assurance is the independent verification of a firm's sustainability report to enhance the reliability and credibility of the disclosed ESG information (Bu et al., 2024).	Dummy variable: 1 = firm obtains assurance services for its sustainability report; 0 = firm does not obtain assurance services (Bu et al., 2024).

4. RESULTS AND DISCUSSION

Descriptive Statistics

Based on the descriptive statistics presented in Table 3, greenwashing has a mean value of -0.00 and a standard deviation of 1.01. The mean value close to zero is consistent with the standardized measurement of greenwashing, which is calculated as the difference between standardized ESG disclosure and standardized ESG performance. The minimum value of -2.16 and maximum value of 2.80 indicate variation in the relative discrepancy between ESG disclosure and ESG performance across the sampled firms, with higher positive values indicating greater greenwashing. The Audit Committee has a mean value of 6.69 with a standard deviation of 2.81, indicating variation in the annual frequency of Audit Committee meetings. CEO equity compensation has a mean value of 8.95 with a standard deviation of 11.44. The median value of CEO equity compensation is 0.00, compared with a mean of 8.95, indicating a highly right-skewed distribution, with at least half of the firm-year observations reporting zero CEO equity compensation. This pattern results from the measurement of CEO equity compensation as CEO share ownership multiplied by the average share price, whereby observations in which the CEO holds no shares generate a value of zero. The skewed distribution reflects the characteristics of the observed CEO equity compensation data, particularly the presence of zero values in the sample. A logarithmic transformation was not applied because the variable contains zero values, and the original measure was retained to

preserve the operational definition of CEO equity compensation. Board gender diversity has a mean value of 13.74 and a standard deviation of 15.96, indicating considerable variation in gender diversity across boards of directors. Meanwhile, ESG report assurance has a mean value of 0.17, with a minimum of 0 and a maximum of 1. This finding indicates that only a relatively small proportion of the sampled firms obtain assurance for their ESG reports.

Table 3. Descriptive Statistics

	GW	AC	CEC	BGD	ESGA
Mean	-0.000000	6.692308	8.946767	13.74054	0.169231
Median	-0.140454	7.000000	0.000000	11.80556	0.000000
Maximum	2.804913	12.00000	27.70701	70.00000	1.000000
Minimum	-2.156040	4.000000	0.000000	0.000000	0.000000
Std. Dev.	1.007404	2.805991	11.44487	15.95884	0.376406

Results

The panel regression model selection results presented in Table 4 indicate that the most appropriate regression model is the fixed effects model (FEM) for both models. For Model 1, the Chow test indicates that FEM is preferable to the common effects model (CEM), while the Hausman test indicates that FEM is preferable to the random effects model (REM). Therefore, FEM is selected for Model 1. Similarly, for Model 2, the Chow test indicates that FEM is preferable to CEM, and the Hausman test indicates that FEM is preferable to REM. The Lagrange multiplier (LM) test indicates that REM is preferable to CEM for both models. Accordingly, the final model selection is FEM for both Model 1 and Model 2.

Table 4. Panel Data Regression Model Selection Results

Model Selection Test	Model 1	Model 2
<u>Chow Test</u>		
Prob. Cross-section F	0.0000	0.0000
Result	FEM	FEM
<u>Hausman Test</u>		
Prob. Cross-section Random	0.0385	0.0186
Result	FEM	FEM
<u>Lagrange Multiplier Test</u>		
Prob. Cross-section Breusch-Pagan	0.0000	0.0000
Result	REM	REM
Selected Model	FEM	FEM

For Model 1, the Prob. (F-statistic) of 0.0000 indicates that the Audit Committee, CEO equity compensation, and board gender diversity jointly affect greenwashing at the 1% significance level, as reported in Table 5. The Adjusted R-squared of 0.7394 indicates that Model 1 explains 73.94% of the variation in greenwashing. Model 2 incorporates the interaction terms between ESG report assurance and the three corporate governance variables to examine the moderating effects. The Prob. (F-statistic) of 0.0000 indicates that Model 2 is jointly significant at the 1% significance level, with an Adjusted R-squared of 0.7421. Thus,

Model 2 explains 74.21% of the variation in greenwashing, slightly higher than the 73.94% explained by Model 1.

Table 5. Panel Data Regression Results

Variables	Model 1		Model 2	
	Coefficient	Prob.	Coefficient	Prob.
C	-0.4974	0.0704	-0.5164	0.0821
AC	0.0599	0.0716*	0.0602	0.0944*
CEC	0.0085	0.5079	0.0074	0.5804
BGD	0.0015	0.8334	0.0047	0.5426
ESGA			0.6520	0.2697
AC × ESGA			-0.0341	0.6196
CEC × ESGA			0.0220	0.1834
BGD × ESGA			-0.0416	0.0472**
Adjusted R-squared	0.7394		0.7421	
F-statistic	14.070		12.602	
Prob. F-statistic	0.0000***		0.0000***	
N	130		130	

***1 %, **5 %, *10 % level of significance.

Table 6. Hypothesis Testing Results

Hypothesis	Construct	Coefficient	Probability	Result
H ₁	AC → GW	0.0599	0.0716*	Accepted
H ₂	CEC → GW	0.0085	0.5079	Rejected
H ₃	BGD → GW	0.0015	0.8334	Rejected
H ₄	AC x ESGA → GW	-0.0341	0.6196	Rejected
H ₅	CEC x ESGA → GW	0.0220	0.1834	Rejected
H ₆	BGD x ESGA → GW	-0.0416	0.0472**	Accepted

***1 %, **5 %, *10 % level of significance. AC= Audit Committee; CEC= CEO equity compensation; BGD= Board gender diversity; ESGA= ESG report assurance.

Discussion

The Influence of the Audit Committee on Greenwashing

The results of the first hypothesis test (H₁) in Model 1 indicate that the Audit Committee has a positive and significant effect on greenwashing at the 10% significance level, with a coefficient of 0.0599 and a probability value of 0.0716; therefore, H₁ is accepted. This finding indicates that a higher frequency of Audit Committee meetings is associated with higher levels of greenwashing. In Model 2, which incorporates ESG report assurance and its interaction terms with the corporate governance variables, the coefficient of the Audit Committee remains positive and statistically significant at the 10% level, with coefficient of 0.0602 and a probability value of 0.0944. However, the increase in the p-value indicates weaker statistical evidence in the moderation model. Because Model 2 includes interaction terms, the coefficient of the Audit Committee represents its conditional association with greenwashing when ESG report assurance equals zero. Nevertheless, the positive coefficient across both models indicates that the direction of the association remains consistent. One possible explanation is

that meeting frequency captures the intensity of formal oversight rather than the substantive quality of ESG monitoring. Frequent meetings may be conducted primarily to address conventional financial reporting, internal control, and regulatory compliance, while environmental claims and the consistency between ESG disclosures and underlying environmental performance may receive less detailed scrutiny. In the Indonesian context, formal corporate governance structures may therefore coexist with limitations in the substantive oversight of non-financial information. This finding is consistent with Hidayah & Ratmono (2025), who found that Audit Committee meeting frequency has a positive and significant effect on greenwashing among Indonesian mining companies. The finding also suggests that meeting frequency alone may not represent the competence, independence, ESG expertise, or quality of discussions required to identify potentially misleading environmental disclosures. Accordingly, a higher number of Audit Committee meetings does not necessarily translate into stronger substantive oversight of greenwashing.

The Influence of CEO Equity Compensation on Greenwashing

The results of the second hypothesis test (H2) in Model 1 indicate that CEO equity compensation has no significant effect on greenwashing. CEO equity compensation has a coefficient of 0.0085 with a probability value of 0.5079; therefore, H2 is rejected. This finding suggests that equity-based compensation does not significantly influence Greenwashing among the sampled manufacturing firms in Indonesia. From an agency perspective, CEO equity incentives are intended to align managerial interests with those of shareholders; however, the equity measure used in this study reflects CEO share ownership and is not directly linked to ESG performance or environmental targets. Consequently, holding equity may create incentives to protect firm value without necessarily providing a specific incentive to improve the credibility of ESG disclosures or reduce greenwashing. This condition may be particularly relevant in Indonesia, where sustainability report assurance remains a voluntary practice and the credibility of sustainability information is not uniformly supported by independent verification (Meutia et al., 2022). In addition, greenwashing may generate short-term reputational or market benefits while the potential costs of detection are uncertain, allowing equity-based incentives to operate primarily through financial rather than environmental performance considerations. This interpretation is consistent with Zou et al. (2015) and Fabrizi et al. (2014), who suggest that equity-based incentives do not necessarily lead to substantive social or environmental commitments. The finding contrasts with K. Li et al. (2024), who found a significant negative effect of CEO equity compensation on greenwashing in China. The difference may reflect variations in institutional environments and the design of executive incentives across countries. Therefore, CEO equity compensation alone may be insufficient to constrain greenwashing when the compensation scheme is not explicitly connected to measurable ESG outcomes.

The Influence of Board Gender Diversity on Greenwashing

The results of the third hypothesis test (H3) in Model 1 indicate that board gender diversity does not have a significant effect on greenwashing. Board gender diversity has a coefficient of 0.0015 with a probability value of 0.8334; therefore, H3 is rejected. This finding indicates that variation in the proportion of female directors does not, by itself, significantly explain differences in greenwashing among the sampled firms. Although gender-diverse

boards may introduce broader perspectives on environmental, social, and reputational risks, the presence of female directors does not necessarily translate into substantive influence over ESG reporting decisions. The effectiveness of board gender diversity may depend on other board characteristics, such as directors' independence, authority, expertise, and involvement in sustainability-related decision-making. The finding differs from Ma & Ahmad (2024) and Liu (2024), who report negative relationships between female board representation and greenwashing. The difference suggests that gender representation alone may not be sufficient to constrain symbolic ESG disclosure in the Indonesian manufacturing context. Thus, the insignificant direct effect of board gender diversity also provides a basis for examining whether external verification through ESG report assurance can enhance the ability of gender-diverse boards to exercise substantive oversight, as tested in H6.

The Moderating Role of ESG Report Assurance on the Relationship Between the Audit Committee and Greenwashing

The results of the fourth hypothesis test (H4) in Model 2 indicate that ESG report assurance does not significantly moderate the relationship between the Audit Committee and greenwashing. The interaction term between Audit Committee and ESG report assurance has a coefficient of -0.0341 with a probability value of 0.6196; therefore, H4 is rejected. Although the negative coefficient is consistent with the expected direction, its lack of statistical significance indicates that there is insufficient evidence that ESG report assurance weakens the positive relationship between the Audit Committee meeting frequency and greenwashing. One possible explanation is that external assurance does not automatically translate into more substantive internal scrutiny of ESG disclosures. In Indonesia, sustainability report assurance remains a voluntary practice, and the presence of assurance does not necessarily indicate that the Audit Committee has stronger ESG expertise or actively evaluates environmental claims (Meutia et al., 2022). Moreover, this study measures the Audit Committee based on meeting frequency, which reflects how often the committee meets rather than the substance of its oversight. Frequent meetings may therefore occur without critical evaluation of assurance findings or adequate scrutiny of inconsistencies between ESG disclosures and actual environmental performance. Although ESG report assurance is expected to complement internal monitoring by providing an additional layer of verification, its potential to constrain greenwashing may depend on whether the Audit Committee actively evaluates and incorporates assurance findings into its oversight activities. Thus, the findings suggest that the presence of external assurance alone may be insufficient to weaken the positive association between the Audit Committee meeting frequency and greenwashing.

The Moderating Role of ESG Report Assurance on the Relationship Between CEO Equity Compensation and Greenwashing

The results of the fifth hypothesis test (H5) in Model 2 indicate that ESG report assurance does not significantly moderate the relationship between CEO equity compensation and greenwashing. The interaction term between CEO equity compensation and ESG report assurance has a coefficient of 0.0220 with a probability value of 0.1834; therefore, H5 is rejected. This finding indicates that the presence of ESG report assurance does not significantly alter the relationship between CEO equity-based incentives and greenwashing. One possible

explanation is that the assurance mechanism and CEO equity compensation operate through different channels. ESG report assurance primarily concerns the credibility and verification of sustainability information, whereas CEO equity compensation in this study is based on CEO share ownership and average share price rather than explicit ESG-linked performance targets. Consequently, assurance may improve the credibility of disclosed information without substantially changing the underlying financial incentives associated with CEO share ownership. In addition, because sustainability report assurance remains voluntary among Indonesian companies, its presence may not necessarily impose sufficient external pressure to change managerial incentive structures (Meutia et al., 2022). The insignificant interaction therefore suggests that external verification alone may be insufficient to align CEO equity incentives with substantive environmental performance. This finding differs from K. Li et al. (2024), indicating that the moderating role of external monitoring may depend on the institutional setting and the specific design of executive compensation.

The Moderating Role of ESG Report Assurance on the Relationship Between Board Gender Diversity and Greenwashing

The results of the sixth hypothesis test (H6) in Model 2 indicate that ESG report assurance significantly moderates the relationship between board gender diversity and greenwashing. The interaction term has a coefficient of -0.0416 with a probability value of 0.0472; therefore, H6 is accepted. The negative interaction coefficient indicates that ESG report assurance strengthens the negative relationship between board gender diversity and greenwashing. This finding suggests that the presence of external verification may provide more credible ESG information for board-level oversight. Prior research shows that assurance can increase the perceived credibility of sustainability information (Pflugrath et al., 2011) and can function as an external governance mechanism by reducing information asymmetry and providing more reliable information for other governance mechanisms (Bu et al., 2024). In addition, Ma & Ahmad (2024) find that board gender diversity is negatively associated with greenwashing and that an additional governance mechanism, namely a CSR committee, can strengthen the relationship between board characteristics and greenwashing. These findings provide a basis for interpreting the significant interaction in this study: ESG report assurance may complement board-level oversight by providing independently verified information that can be used to scrutinize ESG disclosures more critically. Notably, the direct effect of board gender diversity is insignificant in Model 1, whereas its interaction with ESG report assurance is significant in Model 2. This pattern suggests that the role of board gender diversity in addressing greenwashing may become more evident when accompanied by an external verification mechanism. Therefore, this study extends previous research by examining ESG report assurance as a moderating mechanism in the relationship between board gender diversity and greenwashing.

5. CONCLUSIONS AND SUGGESTIONS

The findings indicate that the Audit Committee has a positive and significant effect on greenwashing; therefore, H1 is accepted. In contrast, CEO equity compensation and board gender diversity do not have significant effects on greenwashing; therefore, H2 and H3 are rejected. ESG report assurance does not significantly moderate the relationships between the

Audit Committee, CEO equity compensation, and greenwashing; therefore, H4 and H5 are rejected. Meanwhile, ESG report assurance significantly strengthens the negative relationship between board gender diversity and greenwashing, supporting H6. These findings suggest that Audit Committee meeting frequency alone may not represent substantive ESG oversight, while the role of board gender diversity in addressing greenwashing may become more evident when supported by external verification through ESG report assurance.

From a theoretical perspective, this study provides evidence that the relationship between corporate governance mechanisms and greenwashing depends on the characteristics of internal oversight and the support provided by external verification. The positive effect of Audit Committee meeting frequency suggests that meeting intensity alone may not necessarily translate into substantive monitoring of ESG information. The insignificant effects of CEO equity compensation and board gender diversity further indicate that individual governance mechanisms may not automatically influence greenwashing. However, the significant interaction between board gender diversity and ESG report assurance suggests that external verification can complement board-level governance by providing more credible information for ESG oversight. These findings extend the application of legitimacy theory by demonstrating that firms' efforts to maintain credible ESG disclosure may involve both internal governance mechanisms and external verification. From a practical perspective, firms should strengthen the substantive quality of Audit Committee oversight, particularly in ESG-related matters, rather than relying solely on meeting frequency. Firms may also consider adopting ESG report assurance and strengthening meaningful board gender diversity to support more credible sustainability reporting. Regulators may encourage broader adoption and stronger practices of independent assurance to improve the transparency and reliability of corporate sustainability disclosures.

This study has several limitations. First, measuring the Audit Committee primarily by annual meeting frequency may not adequately capture the competence and effectiveness of Audit Committee members, particularly in ESG-related oversight. Second, measuring greenwashing using the difference between standardized ESG disclosure and standardized ESG performance remains dependent on the characteristics, methodologies, and availability of data from Bloomberg and Refinitiv. Third, the sample is limited to manufacturing firms listed on the Indonesia Stock Exchange over a five-year period from 2020 to 2024, which may limit the generalizability of the findings to other industries and periods. Future research could extend the sample to environmentally intensive sectors, such as mining and energy, employ longer observation periods, and incorporate more detailed Audit Committee and board characteristics, including ESG expertise, educational background, independence, and other governance attributes, to provide a more comprehensive understanding of the determinants of greenwashing.

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