THE CREDIBILITY GAP IN CLIMATE REPORTING: GOVERNANCE AS A PREDICTOR OF EMISSIONS DATA ACCURACY

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Abstract

The increasing adoption of climate-related disclosures has intensified concerns regarding the credibility and accuracy of reported greenhouse gas (GHG) emissions. This study empirically examines the extent to which corporate governance quality predicts emissions data accuracy, thereby addressing the credibility gap in climate reporting. Using a panel dataset of 120 publicly listed firms across energy, manufacturing, and financial sectors from 2019 to 2024, the study employs fixed-effects regression analysis. Emissions accuracy is proxied by the deviation between self-reported emissions and benchmark estimates derived from industry-adjusted intensity models. The results reveal that governance quality significantly improves emissions data accuracy, with board independence and sustainability governance structures exerting strong negative effects on reporting discrepancies. The findings remain robust across alternative model specifications. The study contributes to ESG literature by shifting emphasis from disclosure quantity to disclosure credibility and provides policy-relevant insights for strengthening governance frameworks in climate reporting.

Keywords: *Climate reporting, ESG disclosure, governance quality, emissions accuracy, greenwashing, corporate transparency*

Introduction

Climate change has emerged as one of the most pressing global challenges of the 21st century, with far-reaching implications for economic stability, environmental sustainability, and social welfare. In response, governments, regulators, investors, and other stakeholders have intensified pressure on corporations to disclose their greenhouse gas (GHG) emissions and climate-related risks (Jiang et al., 2025). Consequently, climate reporting has evolved from a voluntary corporate social responsibility practice into a central component of Environmental, Social, and Governance (ESG) frameworks and corporate accountability systems. In recent years, regulatory initiatives and market-driven mechanisms have significantly expanded the scope and depth of climate-related disclosures. Frameworks such as sustainability reporting standards and carbon disclosure initiatives have encouraged firms to provide detailed information on emissions, climate strategies, and transition risks. However, despite the rapid growth in the volume of disclosures, concerns persist regarding their credibility, comparability, and reliability. The increasing complexity of emissions accounting, particularly with respect to indirect emissions (Scope 2 and Scope 3) has further complicated accurate measurement and reporting. Empirical evidence suggests that ESG disclosures frequently diverge from actual environmental performance, raising concerns about greenwashing, where firms selectively disclose favorable information to create a misleading impression of sustainability (Jiang et al., 2023). This divergence is often attributed to managerial incentives to enhance corporate image, attract investment, or comply superficially with regulatory expectations. In addition, inconsistencies across reporting frameworks and the absence of universally accepted measurement standards contribute to significant variability in emissions data (Christensen et al., 2021). These factors collectively give rise to what is increasingly described in the literature as the credibility gap in climate reporting, wherein disclosed emissions figures may not accurately reflect firms' true environmental impact.

From a theoretical perspective, this credibility gap can be understood through the lens of agency theory, which posits that managers may engage in opportunistic behavior when monitoring mechanisms are weak, leading to biased or incomplete disclosures. Similarly, signaling theory suggests that firms with superior environmental performance may use credible disclosures to signal their quality, whereas firms with poorer performance may mimic such disclosures without substantive improvements. The coexistence of these dynamics contributes to heterogeneity in reporting quality across firms. Corporate governance has been widely recognized as a critical mechanism for mitigating these challenges. Effective governance structures, characterized by board independence, strong audit functions, and robust oversight mechanisms play a vital role in enhancing transparency, reducing information asymmetry, and constraining managerial opportunism (Gillan et al., 2021). In the context of climate reporting, governance mechanisms can influence not only the extent of disclosure but also the accuracy and integrity of reported data.

Moreover, the growing integration of climate risk into financial decision-making has heightened the demand for reliable emissions data. Institutional investors increasingly incorporate environmental metrics into portfolio allocation and risk assessment processes, recognizing that climate-related risks can have material financial implications (Krueger et al., 2020). Inaccurate or misleading emissions data therefore poses significant risks, not only to investors but also to broader market efficiency and policy effectiveness. Despite the recognized importance of governance in shaping disclosure practices, existing empirical research has largely focused on the quantity and determinants of ESG disclosures, rather than their accuracy or credibility. This represents a critical gap in the literature, particularly in light of increasing regulatory scrutiny and the growing importance of high-quality environmental data. Accordingly, this study seeks to extend the literature by empirically examining whether corporate governance quality serves as a predictor of emissions data accuracy. By focusing on the credibility dimension of climate reporting, the study provides new insights into the role of governance in enhancing the reliability of ESG disclosures. The rapid expansion of ESG and climate-related disclosures has not been matched by a corresponding improvement in the accuracy and reliability of reported emissions data. While firms increasingly report detailed information on their environmental performance, substantial discrepancies persist between disclosed emissions figures and independently estimated or actual emissions levels. These discrepancies represent a fundamental challenge to the credibility of climate reporting and raise serious concerns about the integrity of ESG information.

One of the central issues underlying this problem is the lack of standardized and enforceable reporting frameworks (Jiang et al., 2025). Although several guidelines and standards exist, their voluntary nature and methodological differences allow firms considerable discretion in how emissions are measured and reported. This flexibility, while beneficial in accommodating diverse industry contexts, also creates opportunities for selective disclosure and manipulation. Furthermore, the complexity of emissions accounting, particularly for Scope 3 emissions, which involve indirect emissions across supply chains introduces significant measurement uncertainty. Firms often rely on estimates, assumptions, and third-party data, which may vary in quality and consistency. As a result, reported emissions figures may not accurately reflect actual environmental impact, thereby widening the credibility gap. Another critical factor contributing to this problem is managerial opportunism, driven by incentives to enhance corporate reputation, meet stakeholder expectations, or comply with regulatory requirements at minimal cost. In the absence of strong governance mechanisms, managers may engage in symbolic reporting practices, emphasizing disclosure over substantive environmental performance improvements. This behavior is consistent with findings that ESG disclosures do not always translate into better environmental outcomes (Jiang et al., 2023).

While prior research has extensively examined the determinants of ESG disclosure levels, relatively little attention has been paid to the quality and accuracy of the disclosed information. This represents a significant gap in the literature, as the usefulness of climate reporting ultimately depends on its reliability. Without accurate data, stakeholders, including investors, regulators, and policymakers are unable to make informed decisions, thereby undermining the effectiveness of climate governance frameworks. Corporate governance is expected to play a crucial role in addressing these challenges by enhancing oversight, improving internal controls, and ensuring the integrity of reporting processes. However, empirical evidence on the relationship between governance quality and emissions data accuracy remains limited. Existing studies have primarily focused on financial reporting quality, with less emphasis on non-financial disclosures such as climate reporting. Therefore, the central problem addressed in this study is the lack of empirical evidence on whether and how corporate governance influences the accuracy of emissions data in climate reporting. Addressing this problem is essential for bridging the credibility gap and improving the effectiveness of ESG disclosures in promoting sustainable corporate behavior.

The objectives of this study are:

1. To examine the extent of emissions reporting discrepancies among firms.
2. To evaluate the effect of governance quality on emissions data accuracy.
3. To assess the role of board independence and sustainability governance structures in improving emissions reporting credibility.

In order to address these objectives, the study explores the following research questions:

1. To what extent do firms exhibit discrepancies in emissions reporting?
2. How does governance quality influence emissions data accuracy?
3. Do board independence and sustainability governance structures improve the credibility of climate reporting?

Based on these research questions, the study proposes the following hypotheses:

H1: Governance quality has a significant negative effect on emissions reporting discrepancies

H2: Board independence is significantly negatively associated with emissions reporting discrepancies.

H3: Sustainability governance structures are significantly negatively associated with emissions reporting discrepancies.

Literature Review

The rapid evolution of climate reporting reflects the increasing importance of environmental accountability in corporate practice. However, the expansion of ESG disclosures has not necessarily translated into improved data reliability. Instead, the literature reveals persistent concerns regarding inconsistencies, measurement challenges, and credibility issues in emissions reporting. These concerns are particularly relevant in understanding the extent of reporting discrepancies, the role of governance mechanisms, and the effectiveness of specific governance structures in ensuring emissions data accuracy.

Emissions Reporting Discrepancies and the Credibility Gap

According to Obizue, Enomah & Onyebu (2025), a growing body of research highlights the existence of significant discrepancies between reported emissions and actual environmental performance. Although firms increasingly disclose greenhouse gas (GHG) emissions, the absence of standardized and universally enforced reporting frameworks has resulted in substantial variation in how emissions are measured, calculated, and presented. This lack of standardization reduces comparability across firms and limits the reliability of ESG disclosures (Christensen et al., 2021). Recent empirical evidence further demonstrates that increased disclosure does not necessarily equate to improved transparency. For instance, firms with higher emissions levels are often more likely to disclose ESG information, not necessarily to reflect actual performance improvements, but to manage reputational risk. This phenomenon is closely linked to greenwashing, where disclosures are used strategically to create a perception of environmental responsibility (Jiang et al., 2025). Moreover, ESG datasets themselves are often characterized by missing data, estimation errors, and methodological inconsistencies, which introduce uncertainty into emissions reporting. Studies show that differences in data imputation and estimation techniques can significantly affect ESG scores and emissions metrics, further undermining reliability (Caprioli et al., 2024). These challenges are particularly pronounced in Scope 3 emissions, where firms rely heavily on indirect estimates and third-party data.

Governance Quality and Emissions Data Accuracy

Corporate governance is widely recognized as a key mechanism for enhancing the quality and credibility of corporate disclosures. Governance structures such as board oversight, audit independence, and internal control systems play a critical role in reducing information asymmetry and constraining managerial opportunism. In ESG contexts, governance quality is particularly important because environmental disclosures are often less regulated and more susceptible to

manipulation than financial reporting. Empirical evidence indicates that strong governance mechanisms significantly improve disclosure quality. For example, audit governance, characterized by auditor independence, expertise, and transparency has been shown to enhance the credibility and reliability of ESG information (Zhang et al., 2024). Similarly, firms with stronger internal controls and governance structures tend to produce higher-quality ESG disclosures, which are associated with improved firm performance and risk management outcomes (Li et al., 2025). From a theoretical perspective, agency theory provides a robust explanation for these findings. In the absence of effective governance, managers may have incentives to misreport or selectively disclose information to achieve personal or organizational objectives. Governance mechanisms act as monitoring tools that align managerial actions with stakeholder interests, thereby improving reporting accuracy. Additionally, signaling theory suggests that firms with strong governance are more likely to provide credible disclosures as a means of differentiating themselves from lower-quality firms. Furthermore, the role of ESG disclosure in reducing market uncertainty and enhancing investor confidence underscores the importance of data accuracy. Studies show that reliable ESG and carbon disclosure reduces information asymmetry and improves market outcomes (Moussa & Elmarzouky, 2024). This reinforces the argument that governance quality is a critical determinant of emissions data accuracy. Overall, the literature strongly supports the expectation that governance quality improves emissions reporting reliability.

Board Independence, Sustainability Governance, and Reporting Credibility

Beyond aggregate governance quality, specific governance mechanisms, particularly board independence and sustainability governance structures play a crucial role in shaping emissions reporting outcomes. Board independence is widely regarded as a cornerstone of effective governance, as independent directors are better positioned to provide objective oversight and challenge managerial decisions. Empirical studies show that independent boards are associated with higher levels of transparency and improved disclosure quality. Independent directors enhance monitoring effectiveness, reduce conflicts of interest, and ensure that disclosures reflect actual performance rather than managerial bias (Jiang et al., 2025). This is particularly important in ESG reporting, where subjective judgments and estimation techniques create opportunities for manipulation. In addition to board independence, the establishment of sustainability committees or dedicated ESG governance structures represents an institutional response to the increasing complexity of climate reporting. These committees provide specialized oversight, focusing on environmental risks, emissions measurement, and disclosure practices. Their presence signals a firm's commitment to sustainability and enhances accountability in climate reporting processes. The literature on greenwashing further emphasizes the importance of these governance mechanisms. Firms may engage in symbolic disclosure practices, overstating environmental performance to influence stakeholders. However, effective governance, particularly through

independent oversight and specialized committees can mitigate such behavior by enforcing stricter reporting standards and improving transparency (Jiang et al., 2025). Additionally, studies in emerging markets highlight that governance structures significantly influence ESG disclosure practices, with stronger governance leading to more transparent and reliable reporting (Adardour et al., 2025). This suggests that governance mechanisms are not only relevant but also essential in diverse institutional contexts.

Climate Risk, Investment Decisions, and the Demand for Reliable Data

The increasing integration of climate risk into financial decision-making has further amplified the importance of emissions data accuracy. Investors, asset managers, and financial institutions increasingly rely on ESG metrics to assess long-term risks and opportunities. However, the effectiveness of these assessments depends critically on the reliability of the underlying data. Recent evidence indicates that poor-quality ESG data remains a major barrier to effective investment decision-making, with inconsistencies and gaps in emissions data limiting comparability and reducing confidence in ESG metrics. This highlights the broader implications of the credibility gap, extending beyond corporate reporting to affect capital allocation and market efficiency. Moreover, the growing reliance on ESG disclosures in financial markets underscores the need for robust governance mechanisms to ensure data accuracy. Without reliable emissions data, investors may misprice climate risks, leading to inefficient allocation of resources and increased systemic risk (Obizue, Chuu-Uzomah & Joel Isaih, 2025).

Research Gap and Contribution

Despite the extensive literature on ESG disclosure and corporate governance, a critical gap remains regarding the accuracy and credibility of emissions data. Most existing studies focus on the determinants, extent, or consequences of disclosure, rather than examining whether the disclosed information accurately reflects actual environmental performance. Furthermore, while governance has been widely linked to disclosure quality, its role as a predictor of emissions data accuracy remains underexplored. This gap is particularly significant given the increasing importance of climate reporting in regulatory, investment, and corporate contexts. This study addresses this gap by empirically examining the relationship between governance quality, board independence, sustainability governance structures, and emissions reporting accuracy. By doing so, it provides a more nuanced understanding of the mechanisms required to bridge the credibility gap in climate reporting and aligns directly with the study's objectives, research questions, and hypotheses.

METHODOLOGY

This study adopted a quantitative and explanatory research approach to investigate the relationship between corporate governance mechanisms and emissions data accuracy, with particular emphasis

on addressing the credibility gap in climate reporting. The explanatory design was considered appropriate because the study sought not only to describe the extent of emissions reporting discrepancies but also to establish causal linkages between governance structures and the reliability of reported greenhouse gas (GHG) emissions. To achieve this, the study employed a panel data framework, which enabled the simultaneous analysis of cross-sectional variations across firms and time-series changes over the study period. This approach enhanced analytical rigor by controlling for unobserved heterogeneity and capturing dynamic changes in both governance practices and reporting behavior. The population of the study consisted of publicly listed firms operating in the energy, manufacturing, and financial services sectors. These sectors were purposively selected due to their significant contributions to global emissions and their heightened exposure to environmental scrutiny, regulatory pressures, and stakeholder expectations regarding sustainability disclosures. A purposive sampling technique was employed to ensure that only firms with relevant and sufficient data were included in the analysis. Specifically, firms were selected based on the availability of sustainability or ESG reports, the disclosure of emissions data (Scope 1 and Scope 2, and where available, Scope 3), and accessible information on corporate governance structures such as board composition and oversight mechanisms. Based on these criteria, a final sample of 120 firms was obtained, covering a six-year period from 2019 to 2024, resulting in a balanced panel dataset of 720 firm-year observations. This sample size was considered adequate for panel regression analysis and ensured both statistical power and generalizability of findings. The study relied on secondary data collected from multiple credible and publicly available sources, including corporate annual reports, sustainability reports, carbon disclosure reports, and recognized ESG databases. Data collection involved careful extraction and cross-verification across these sources to ensure consistency and reliability. This triangulation approach was particularly important in ESG research, where data quality can vary significantly across reporting platforms. By validating emissions and governance data across multiple sources, the study minimized measurement errors and enhanced the credibility of the dataset.

The key dependent variable in this study was emissions reporting discrepancy, which served as a proxy for emissions data accuracy. This variable captured the extent to which firms' reported emissions deviated from independently estimated or benchmark emissions. It was operationalized as the absolute difference between reported emissions and benchmark emissions, scaled by reported emissions. Benchmark emissions were derived using industry-adjusted emissions intensity models that accounted for firm size, sectoral characteristics, and production levels. This approach ensured that the measure reflected both firm-specific and industry-level variations, thereby providing a robust indicator of reporting accuracy. A higher value of this variable indicated greater discrepancy and, consequently, lower credibility of emissions data. The independent variables were designed to capture key dimensions of corporate governance. Governance quality was measured using a composite index that incorporated various governance attributes, including

board structure, audit effectiveness, and ownership characteristics. This index was normalized to facilitate comparability across firms. Board independence was measured as the proportion of independent directors on the board, reflecting the board's capacity to provide objective oversight and mitigate managerial opportunism. In addition, sustainability governance structures were captured using a dummy variable that indicated the presence or absence of a sustainability or ESG committee within the firm. This variable reflected the institutionalization of environmental oversight and the extent to which firms prioritized sustainability governance. To ensure that the estimated relationships were not confounded by other firm-specific factors, the study included several control variables commonly used in corporate governance and ESG research. Firm size, measured as the natural logarithm of total assets, was included to account for scale effects, as larger firms were more likely to have sophisticated reporting systems and greater public scrutiny. Leverage, measured as the debt-to-equity ratio, was included to capture financial risk, which might influence disclosure incentives. Firm performance, proxied by return on assets, was incorporated to control for the potential influence of profitability on reporting behavior. In addition, industry and year dummy variables were included to control for sector-specific characteristics and temporal effects such as regulatory changes and macroeconomic conditions.

The empirical analysis was conducted using panel regression techniques, with the fixed-effects model serving as the primary estimation method. The fixed-effects approach was particularly suitable for this study because it controlled for unobserved, time-invariant firm characteristics that might influence emissions reporting behavior, such as organizational culture or managerial philosophy. By focusing on within-firm variations over time, the model provided more reliable estimates of the impact of governance variables on emissions reporting discrepancies. The choice between fixed-effects and random-effects models was validated using the Hausman specification test, which confirmed the appropriateness of the fixed-effects approach. To further enhance the robustness of the analysis, the study employed heteroskedasticity-robust standard errors to address potential violations of classical regression assumptions. Additional diagnostic tests were conducted to ensure the validity of the model. Multicollinearity among explanatory variables was assessed using the variance inflation factor, ensuring that the independent variables were sufficiently distinct. Heteroskedasticity was tested using the Breusch–Pagan test, while autocorrelation was examined using the Wooldridge test for panel data. The Ramsey RESET test was also applied to verify the correctness of the model specification. These diagnostic procedures collectively ensured that the empirical results were reliable and free from major statistical biases.

The methodological framework was explicitly aligned with the study's research questions and hypotheses. The first research question, which examined the extent of emissions reporting discrepancies, was addressed through descriptive and comparative analysis of the dependent variable. The second research question, concerning the effect of governance quality on emissions

data accuracy, was tested through the estimated coefficient of the governance index. The third research question, which focused on board independence and sustainability governance structures, was examined through the respective coefficients of these variables in the regression model. In each case, a negative and statistically significant coefficient was interpreted as evidence that the governance mechanism in question reduced emissions reporting discrepancies and enhanced data accuracy, thereby supporting the corresponding hypotheses.

Finally, the study adhered to strict ethical standards by relying exclusively on publicly available data sources. No confidential or proprietary information was used, and all data were handled with transparency and academic integrity. The use of verifiable secondary data ensured that the study was replicable and consistent with established research practices in the field of ESG and corporate governance. Overall, the methodological approach adopted in this study provided a rigorous and systematic framework for examining the role of governance in improving emissions data accuracy. By combining robust data collection, carefully defined variables, and advanced econometric techniques, the study was well positioned to generate reliable empirical evidence addressing the credibility gap in climate reporting.

RESULTS

This chapter presents the empirical results of the study. The analysis is structured to address each research question and test the corresponding hypotheses. The results include descriptive statistics, correlation analysis, and panel regression estimates, followed by interpretations

Analysis of Emissions Reporting Discrepancies

Research Question 1: To what extent do firms exhibit discrepancies in emissions reporting?

To address this question, descriptive statistics of the emissions reporting discrepancy (ERD) variable were computed.

Descriptive Statistics of Emissions Reporting Discrepancy (ERD)

Statistic	Value
Mean	0.176
Median	0.162
Standard Deviation	0.082

Statistic	Value
Minimum	0.041
Maximum	0.398

Interpretation

These results indicate that the average emissions reporting discrepancy (ERD) across the sampled firms was 0.176, suggesting that, on average, firms exhibited a 17.6% deviation between reported emissions and benchmark estimates. This reflects a moderate but significant level of inaccuracy in emissions reporting. The relatively high standard deviation (0.082) indicates variability across firms, suggesting that while some firms maintain relatively accurate reporting, others exhibit substantial discrepancies. The maximum value (0.398) further highlights extreme cases where emissions reporting deviates significantly from expected benchmarks. These findings confirm the existence of a credibility gap in climate reporting, thereby providing empirical support for the first research objective. The results suggest that emissions discrepancies are widespread and not limited to isolated cases, reinforcing concerns raised in prior literature about the reliability of ESG disclosures.

Relationship Between Governance Variables and Emissions Discrepancies

Before testing the hypotheses, correlation analysis was conducted to examine the relationships between variables.

Correlation Matrix

Variable	ERD	GOV	BIND	SGOV
ERD	1.00	-0.46	-0.39	-0.34
GOV	-0.46	1.00	0.58	0.52
BIND	-0.39	0.58	1.00	0.49
SGOV	-0.34	0.52	0.49	1.00

Interpretation

The correlation results show that governance variables (GOV, BIND, SGOV) are negatively correlated with emissions reporting discrepancies (ERD). This suggests that stronger governance structures are associated with improved emissions accuracy.

The absence of excessively high correlations (above 0.80) indicates that multicollinearity is not a major concern, supporting the validity of subsequent regression analysis.

Effect of Governance Quality on Emissions Accuracy

Research Question 2: How does governance quality influence emissions data accuracy?

Fixed Effects Regression Results (Model 1)

Variable	Coefficient	Std. Error	t-value	p-value
GOV	-0.267	0.069	-3.87	0.000
SIZE	0.049	0.026	1.88	0.062
LEV	0.058	0.031	1.87	0.064
ROA	-0.041	0.019	-2.16	0.032
Constant	0.312	0.081	3.85	0.000

$R^2 = 0.47$, $p < 0.01$

Interpretation

These results show that governance quality (GOV) has a negative and statistically significant effect on emissions reporting discrepancies ($\beta = -0.267$, $p < 0.01$). This indicates that firms with stronger governance structures exhibit lower discrepancies, thereby improving emissions data accuracy. The magnitude of the coefficient suggests that a one-unit increase in governance quality leads to a 26.7% reduction in emissions discrepancies, holding other variables constant. This finding is consistent with agency theory, which posits that effective governance reduces opportunistic behavior and enhances transparency. H1 is accepted. Governance quality significantly improves emissions data accuracy.

Effect of Board Independence and Sustainability Governance

Research Question 3: Do board independence and sustainability governance structures improve emissions reporting credibility?

Fixed Effects Regression Results (Model 2)

Variable	Coefficient	Std. Error	t-value	p-value
BIND	-0.184	0.057	-3.23	0.002
SGOV	-0.139	0.046	-3.02	0.003
SIZE	0.045	0.025	1.80	0.073
LEV	0.061	0.030	2.03	0.045
ROA	-0.038	0.018	-2.11	0.036
Constant	0.298	0.079	3.77	0.000

$R^2 = 0.49$, $p < 0.01$

Interpretation

The results in this Table indicate that both board independence (BIND) and sustainability governance structures (SGOV) have negative and statistically significant effects on emissions reporting discrepancies. Board independence shows a coefficient of -0.184 ($p < 0.01$), suggesting that firms with a higher proportion of independent directors experience reduced discrepancies in emissions reporting. This supports the argument that independent boards enhance monitoring and limit managerial opportunism. Similarly, sustainability governance structures (SGOV) exhibit a coefficient of -0.139 ($p < 0.01$), indicating that the presence of sustainability committees contributes to improved emissions reporting accuracy. These structures likely provide specialized oversight and ensure more rigorous reporting practices. H2 is accepted. Board independence significantly reduces emissions reporting discrepancies.
H3 is accepted. Sustainability governance structures significantly reduce emissions reporting discrepancies.

Summary of Findings

The empirical analysis produced several key findings aligned with the study's objectives, research questions, and hypotheses.

First, the study found that firms exhibit significant emissions reporting discrepancies, confirming the existence of a credibility gap in climate reporting. This finding highlights the limitations of current ESG disclosure practices and underscores the need for improved reporting standards and verification mechanisms. Second, governance quality was found to have a strong and statistically significant negative effect on emissions discrepancies. This indicates that firms with stronger governance frameworks are more likely to produce accurate and reliable emissions data. This

finding supports the theoretical expectation that governance mechanisms enhance transparency and reduce opportunistic reporting behavior. Third, the study demonstrated that board independence plays a critical role in improving reporting credibility. Firms with a higher proportion of independent directors exhibited significantly lower emissions discrepancies, emphasizing the importance of independent oversight in ESG reporting. Fourth, the presence of sustainability governance structures, such as ESG committees, was found to significantly improve emissions data accuracy. These structures provide specialized oversight and reinforce accountability in climate reporting processes. Overall, the results provide robust empirical evidence that governance mechanisms are essential in bridging the credibility gap in climate reporting. The findings confirm that both general governance quality and specific governance structures significantly enhance emissions reporting accuracy.

Discussion

The analysis of emissions reporting among the sampled firms revealed substantial discrepancies between reported and benchmark greenhouse gas emissions, with deviations averaging 17.6% and reaching nearly 40% in extreme cases. These findings indicate a significant credibility gap in climate reporting, confirming that many firms' disclosures do not fully reflect their actual environmental impact. The observed variability among firms suggests that while some companies have established robust internal reporting and verification mechanisms, others may prioritize symbolic compliance over substantive reporting. Such practices are consistent with concerns highlighted in contemporary literature, which emphasizes the prevalence of greenwashing, the lack of standardized measurement methodologies, and the challenges of verifying corporate environmental performance (Christensen et al., 2021; Jiang et al., 2025). The findings further demonstrate that governance quality plays a pivotal role in reducing emissions reporting discrepancies. Firms with higher governance quality, as measured by composite indices reflecting board structure, audit effectiveness, and ownership transparency, exhibited lower reporting inaccuracies. This result is theoretically consistent with agency theory, which posits that effective governance structures reduce conflicts of interest and managerial opportunism. It also aligns with signaling theory, suggesting that strong governance serves as a credible signal of transparency and reliability to external stakeholders (Serafeim & Yoon, 2022; Li et al., 2025). Practically, this implies that governance mechanisms are not merely administrative formalities but active contributors to improving the integrity and trustworthiness of ESG disclosures. Firms with robust governance systems are better able to implement monitoring processes, ensure internal accountability, and establish verification procedures that enhance the accuracy of reported environmental data. The study also highlighted the importance of board independence in promoting credible reporting. Firms with a higher proportion of independent directors showed significantly lower deviations in emissions reporting. Independent directors provide objective

oversight, challenge managerial assumptions, and help prevent biased or opportunistic reporting. These findings reinforce prior research that links board independence with enhanced monitoring capacity and reduced managerial opportunism (Adardour et al., 2025). Importantly, independent boards contribute to creating an organizational culture that prioritizes accurate reporting, which is especially critical for environmental disclosures where reputational and financial stakes are high. Similarly, the presence of sustainability governance structures, such as dedicated ESG or sustainability committees, was associated with improved emissions reporting accuracy. These structures institutionalize environmental accountability within the firm, providing specialized oversight of climate-related performance, establishing formal monitoring protocols, and ensuring compliance with recognized reporting standards. By integrating sustainability oversight into corporate governance, firms are able to align strategic decision-making with climate objectives and reduce the risk of symbolic or incomplete reporting. This finding supports the notion that ESG committees and sustainability governance mechanisms are essential for bridging the credibility gap in corporate climate disclosures (Obizue, Olowu & Ogbonna, 2025). The integration of these findings provides a clear picture: strong governance quality, independent oversight, and sustainability governance structures work in tandem to reduce discrepancies between reported and actual emissions. Firms that adopt these mechanisms not only produce more reliable ESG disclosures but also enhance investor confidence, satisfy regulatory expectations, and improve their reputational standing. The evidence suggests that credibility in climate reporting is not solely a function of compliance with regulatory frameworks but is fundamentally influenced by internal governance practices that ensure accuracy, transparency, and accountability. These results also have broader implications for corporate strategy and policymaking. For corporate leaders, the findings emphasize the need to prioritize governance reforms that embed environmental accountability into firm operations. Investors and stakeholders can use governance indicators as a proxy for the credibility of climate disclosures, allowing for more informed decision-making in the allocation of capital. For regulators, the results suggest that governance-based criteria such as board independence and ESG committee structures should be incorporated into ESG reporting standards to strengthen oversight and enhance the accuracy of reported data. In sum, the study provides robust evidence that governance mechanisms are not merely supplementary features but central determinants of reliable climate reporting.

Conclusions

This study investigated the credibility gap in climate reporting and examined the role of corporate governance in predicting the accuracy of emissions disclosures among publicly listed firms in the energy, manufacturing, and financial sectors. Using panel data from 120 firms over the period 2019–2024, the study found that significant discrepancies exist between reported and benchmark emissions, confirming a widespread credibility gap in corporate ESG reporting. The analysis

demonstrated that governance quality has a significant negative effect on emissions reporting discrepancies, indicating that firms with stronger governance structures report more accurate and reliable emissions data. Board independence and the presence of sustainability governance structures were also found to significantly reduce reporting discrepancies. Independent directors provide oversight and mitigate opportunistic reporting, while ESG committees institutionalize environmental accountability, ensuring that reporting processes reflect actual emissions performance. Collectively, these findings provide empirical support for agency and signaling theories, highlighting the role of governance mechanisms in enhancing transparency and credibility in ESG reporting. From a practical standpoint, the study underscores that bridging the credibility gap requires a deliberate focus on governance reforms. Firms should strengthen board oversight, ensure independence of directors, and establish dedicated sustainability committees to promote accurate and reliable reporting. For regulators and standard-setting bodies, incorporating governance criteria into ESG disclosure frameworks can incentivize firms to adopt practices that enhance reporting credibility and stakeholder trust. In conclusion, the credibility of climate reporting is shaped not only by regulatory compliance or disclosure frameworks but fundamentally by internal governance practices. Strong governance quality, independent oversight, and sustainability-focused governance structures collectively enhance the accuracy of emissions reporting, reduce greenwashing, and improve stakeholder confidence. By embedding these mechanisms into corporate structures, firms can achieve more transparent, accountable, and trustworthy climate disclosures, thereby contributing meaningfully to global sustainability efforts and long-term corporate resilience.

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