

Moderating Effect of Board Diversity on the Relationship between Environmental, Social, and Governance Disclosure Quality and Value of Listed Industrial Goods Companies in Nigeria

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Abstract:

The study examined the moderating effect of board diversity on the relationship between Environmental, Social, and Governance (ESG) disclosure quality and the value of listed industrial goods companies in Nigeria. In recent years, ESG considerations have emerged as critical determinants of corporate reputation, investor confidence, and financial performance globally. While ESG disclosures provide non-financial information that informs stakeholders about a firm's sustainability practices, the quality of these disclosures varies widely across firms and sectors. Corporate governance, particularly board diversity, is theorized to influence the effectiveness of ESG reporting by bringing multiple perspectives, enhancing oversight, and promoting transparency. Using a panel dataset of 13 industrial goods firms listed on the Nigerian Exchange between 2015 and 2024, this study employs multiple regression and moderation analysis to examine how board diversity affects the link between ESG disclosure quality and firm value, proxied by market capitalization and Tobin's Q. Preliminary findings indicate that high-quality ESG disclosure is positively associated with firm value, but the strength of this relationship is significantly enhanced when boards are diverse in terms of gender, expertise, and tenure. The results suggest that board diversity acts as a critical governance mechanism that amplifies the market benefits of robust ESG practices. This study contributes to the growing literature on corporate sustainability in emerging markets by highlighting the importance of integrating governance and ESG strategies to maximize firm value. It also offers practical implications for policymakers, regulators, and corporate boards aiming to strengthen ESG reporting frameworks and promote sustainable business practices in Nigeria.

Keywords:

Environmental, Social, Governance, Financial, Industrial, Markets

I. Introduction

Environmental, Social, and Governance (ESG) disclosure has increasingly been recognised as a key determinant of corporate transparency and firm value in both global and emerging capital markets. A recent hybrid literature review highlights that ESG disclosure is widely studied in relation to firm value, cost of capital, and performance outcomes, reflecting strong interest in how ESG practices influence investment decisions and market valuation (Zhang, 2025). Systematic reviews also emphasise the novelty and rapid evolution of ESG research, noting its growing policy and regulatory relevance worldwide (Emerging trends of ESG disclosure, 2024). Empirical studies in China show that higher ESG disclosure scores are significantly associated with firm value, suggesting that markets reward transparency and quality in sustainability reporting (An, Ran & Gao, 2024).

Globally, firms face increasing pressure to improve ESG disclosure quality in response to sustainability risks and investor demand for non-financial information, particularly in environmentally sensitive industries such as manufacturing and industrial production. Investors are integrating ESG metrics into valuation frameworks as measurement barriers diminish and reporting standards evolve (Serafeim & Grewal, 2025). Despite this trend, empirical evidence on the value relevance of ESG disclosure remains mixed, with findings varying across sectors, institutional contexts, and methodological approaches (Hamdouni, 2025; Ahmad et al., 2024; Mensah & Tumelo, 2022).

In Nigeria and Sub-Saharan Africa, ESG research has largely focused on financial services, oil and gas, and consumer goods, while industrial goods companies remain underexplored. Regional studies indicate that ESG reporting and board characteristics influence firm valuation, but detailed sector-specific dynamics in heavy manufacturing are less understood (Aigienohuawa & Imonitie, 2025). This is particularly important as industrial goods firms are among the most environmentally intensive in Nigeria, with implications for environmental compliance, community welfare, and regulatory oversight. Sector-specific evidence suggests that robust ESG disclosure enhances firm value, yet studies isolating industrial goods firms remain limited (Exploring ESG thresholds in Nigeria, 2025).

Many analyses rely on pre-2021 data and fail to capture recent developments in ESG guidance from the Nigerian Exchange Group, improvements in board diversity, and evolving investor scrutiny (Offiaeli, Salawu & Nwobu, 2025). Methodologically, most Nigerian studies examine direct effects of ESG disclosure or board diversity on performance without assessing potential moderating effects, while relying on aggregate indices that do not distinguish between disclosure quality and quantity. Limitations such as short panel periods, single performance metrics, and lack of interaction analyses further restrict the robustness of prior findings (Offiaeli et al., 2025).

Given these domain, period, and methodological gaps, there is insufficient empirical evidence on how ESG disclosure quality affects firm value in Nigeria's industrial goods sector and under what conditions board diversity may enhance its effectiveness. This presents challenges for regulators, investors, and corporate boards in improving disclosure frameworks and governance practices. Consequently, there is a compelling need for a contemporary, sector-specific, and methodologically robust study to examine the moderating role of board diversity in the relationship between ESG disclosure quality and firm value among listed industrial goods companies. Addressing this gap will provide nuanced insights into governance–sustainability linkages and offer practical guidance for enhancing the value relevance of ESG disclosures in emerging markets.

1.1 Hypotheses

H01: Board gender diversity does not significantly influence the value of listed industrial goods companies in Nigeria.

H02: Board gender diversity does not significantly influence the relationship between environmental disclosure quality and firm value.

H03: Board gender diversity does not significantly moderate the relationship between social disclosure quality and firm value.

H04: Board gender diversity does not significantly moderate the relationship between governance disclosure quality and firm value.

II. Review of Literature

2.1 Concept of Firm Value

Bello Marvis, and Okafor (2024) conceptualize firm value in terms of equity market value relative to book value, commonly measured using proxies such as the price-to-book ratio (PBV) and Tobin's Q, indicating that market perceptions are closely linked to reported financial metrics. Sixpence, Adeyeye, and Rajaram (2021), in a South African study, distinguish between enterprise value, which accounts for both equity and debt, and market capitalization, representing equity value alone, and they show that operating earnings are a critical determinant of market-assessed firm value. Nur Wahyuni and Gani (2022) similarly link firm value to profitability, growth, and leverage, suggesting that these financial characteristics shape how markets assess a firm's worth.

Alwan and Risman (2024) describe firm value as the total worth of a company as determined by financial metrics and market perceptions, emphasizing its connection to the potential for generating future cash flows. Collectively, these studies illustrate that firm value is multidimensional, encompassing expected cash flows, profitability, growth prospects, leverage, governance quality, and investor perceptions, and that it can be measured through various proxies such as market capitalization, Tobin's Q, price-to-book ratio, or enterprise value.

Concept of ESG Disclosure Quality

Global Reporting Initiative (GRI, 2002) defines disclosure quality as the process through which companies publicly communicate performance in critical areas, including environmental conservation, social development, and ethical governance. According to GRI, high-quality disclosure enables organizations to demonstrate how they integrate economic, social, and environmental considerations into decision-making. Both definitions position disclosure quality as a strategic tool for enhancing stakeholder trust, engagement, and confidence in a company's commitment to sustainability.

Kolk (2003) provides a more nuanced definition, emphasizing that disclosure quality is a company's disclosure of its strategies, policies, and practices related to corporate social responsibility (CSR). He highlights the importance of such reporting in demonstrating a company's commitment to environmental protection and social equity. According to Kolk, disclosure quality helps companies enhance their legitimacy, particularly in the face of stakeholder concerns about environmental and social impacts. Adams (2004) expands the definition further by focusing on the integration of disclosure quality within a company's overall strategy and governance structure. She contends that disclosure quality is not just about disclosing corporate performance in environmental and social areas but also about embedding these disclosures into the company's broader organizational culture.

2.2 Concept of Board Diversity

Board diversity refers to the inclusion of individuals from varied backgrounds, perspectives, and experiences within the governance structure of a company, particularly the board of directors. Board diversity refers to the variation present in the make up of an organization's board (Song et al., 2020). Furthermore, Ozgur (2020) explicated board diversity to be a diverse blend of features, qualities, and proficiency made available by the individuals in the board room as an input to the decision-making process. A board with variety can facilitate the effective overseeing of the managers because the varying inputs they seek to provide will make the work more effective (Wahid, 2019). Congruently, the resource dependency theory as advanced by Pfeffer and Salancik (1978) affirms that board diversity can equally sharpen the

abilities of board members as they can benefit from the various resources that is embedded in their unique identities. Thus, they can create stronger networks with the further avenue to gain uniquely different information crucial to the decision-making process.

2.3 Empirical Review

Ahmed et al. (2025) explored the role of environmental disclosure in enhancing firm value for 40 nonfinancial companies listed on the Dubai Financial Market between 2020 and 2024. Using panel regression and controlling for firm Size, Leverage, Risk, Industry classification, and Big Four audit presence, the findings demonstrate that high-quality environmental disclosures significantly improve Tobin's Q and market-to-book ratios. The study emphasizes that ESD enhances investor confidence and market perception, particularly in emerging economies with evolving regulatory frameworks.

El-Sayed and Farouk (2025) investigated the impact of social disclosure quality on firm value for 45 nonfinancial firms listed on the Egyptian Exchange from 2019 to 2024. Using panel regression models, the study controlled for Social Disclosure, firm Size, Leverage, Profitability, Risk, Industry classification, and Audit quality. Results show a positive and significant relationship between SSD and Tobin's Q. Firms with robust social reporting practices attract higher investor confidence. The study emphasizes transparency in labor relations and community programs. SSD was found to reduce perceived investment risk. The study does not account for potential endogeneity between SSD and firm value, which may bias the results.

Alvarez and Torres (2023) studied 55 nonfinancial Mexican firms from 2017–2022. Panel regression included Governance Disclosure, firm Size, Profitability, Leverage, Industry classification, and Audit quality. Findings reveal a positive and significant relationship between governance disclosure and firm value. Reporting on board structure, executive oversight, and shareholder rights improved investor confidence. Governance disclosure complements social and economic disclosures. Transparency in governance reduced perceived managerial risk. Cultural and regulatory differences in Mexico may limit applicability to other Latin American countries.

2.4 Theoretical Framework

Signaling Theory: Signaling theory explains how firms communicate valuable information to external stakeholders to reduce information asymmetry and influence perceptions of firm quality. The theory was first introduced by Spence (1973) in the labour market context, but it has since been widely applied in corporate finance, accounting, and sustainability research. The core premise of the theory is that companies possess private information about their performance, strategies, or ethical conduct that external stakeholders, such as investors or regulators, cannot directly observe. Firms use credible signals such as financial statements, ESG disclosures, or corporate governance practices to convey this information and distinguish themselves from less responsible or lower-quality firms.

In the context of ESG reporting, signaling theory suggests that high-quality disclosure acts as a signal of a firm's commitment to sustainability, social responsibility, and effective governance. By voluntarily reporting environmental, social, and governance practices, companies communicate to stakeholders that they are managing risks, adhering to ethical standards, and striving for long-term value creation. For example, environmental disclosures, social responsibility initiatives, and transparent governance reporting serve as signals that a

company is responsive to stakeholder concerns and proactive in addressing societal and environmental challenges (Spence, 1973; Connelly et al., 2011).

Signaling theory is particularly relevant to this study because industrial goods companies in Nigeria operate in sectors with significant environmental and social impacts, where investors and regulators may have limited access to reliable information. High-quality ESG disclosures can act as credible signals that reduce information asymmetry, enhance investor confidence, and potentially increase firm value. Moreover, the presence of a diverse board, including gender diversity, may strengthen these signals, as research suggests that diverse boards are more likely to produce reliable, transparent, and stakeholder-oriented disclosures (Lawal, Igbekoyi & Dagunduro, 2024; Owolabi & Uwuigbe, 2023). In this sense, board diversity can enhance the credibility of ESG signals, thereby improving the market's perception of the firm's value.

Recent studies have applied signaling theory to examine ESG reporting and firm performance. For instance, Cheng, Ioannou, and Serafeim (2021) found that firms with superior ESG reporting experienced positive market reactions, as investors interpreted disclosures as credible signals of sustainability performance. In Nigeria, Uwuigbe et al. (2023) demonstrated that high-quality social and governance disclosures acted as signals that reduced perceived risks and enhanced firm valuation among industrial and consumer goods firms. Similarly, Adeyemi and Oboh (2022) observed that firms that invested in transparent environmental reporting were rewarded with increased investor confidence and market value, supporting the signaling perspective that credible information influences stakeholder decision-making.

The signaling theory provides a robust theoretical foundation for understanding how ESG disclosure quality communicates a firm's sustainability and governance performance to stakeholders. In the context of this study, signaling theory explains how environmental, social, and governance disclosures can serve as credible signals that enhance firm value and how board gender diversity may amplify these signals by increasing the credibility and transparency of reported information.

III. Research Methods

This study employed an ex-post facto research design, a methodological approach chosen deliberately due to its reliance on secondary quantitative data. The population of this study comprises all listed industrial goods companies on the Nigerian Exchange Group (NGX). Industrial goods companies were selected because they operate in capital-intensive and environmentally sensitive sectors, making ESG disclosure particularly relevant to their operations. This study employs a secondary data collection method, relying on archival data rather than primary sources. The study used panel regression for the listed sampled financial companies on the Nigerian Exchange Group in the estimation of the regression equation under consideration.

3.1 Model Specification

$$FV = f(EDQ, SDQ, GDQ, BGD)$$

$$FV_{it} = \beta_{0it} + \beta_1 EDQ_{it} + \beta_2 SDQ_{it} + \beta_3 GDQ_{it} + \beta_4 BGD_{it} + \beta_5 GDQ_{it} * BGD_{it} + \beta_6 EDQ_{it} * BGD_{it} + \beta_7 SDQ_{it} * BGD_{it} + \beta_9 GDQ_{it} * BGD_{it} + e_{it}$$

Where:

FV = Firm value

EDQ = Environment Disclosure Quality
SDQ = Social Disclosure Quality
GDQ = Governance Disclosure Quality
BGD = Board Gender Diversity
 β_0 = Intercept
 β_{1-4} = Coefficient of the independent variables
e = Error term
i = Firm i
t = Time t

Table 1: Measurement of Variable

S/N	Variable	Measurement	Source
1	Firm value	Tobin's Q is calculated by the ratio of the market value of the firm plus debt divided by the book value of its assets.	Endri 2019 Almaqoushi & Powell (2017), Agyemang-Mintah & Schadewitz (2017), Zubair (2016) GRI (2023)
2	Environmental disclosure quality	Global Reporting Initiative G4 Index	(GRI, 2023)
3	Economic disclosure quality	A disclosure of activities related to company operations or activities related to the achievement of company profits	Rezaee & Tuo, (2019) Nugrahani and Artanto (2022)
4	Social disclosure quality	Company's disclosure about the company's social activities.	GRI (2023) Dewi & Sudana, (2015); Nugrahani and Artanto (2022)
5	Governance disclosure quality	Disclosure quality disclosure index for corporate governance	GRI (2023)
6	Board Gender Diversity Firm Size	Proportion of female members to total number of Board members	Uwugbe et al., (2019), Akintayo and Salman (2018)

Source: Researcher's Compilation, 2026

IV. Results and Discussion

The descriptive statistics presented in Table 2 provide an overview of the central tendencies, variability, and distributional properties of the key variables used in this study. The dependent variable, firm value (FV), has a mean of 0.380, a minimum of 0.139, and a maximum of 0.545, with a standard deviation of 0.070. This indicates moderate variation in firm valuation among the sampled industrial goods companies. The negative skew (-0.666) suggests that the distribution of firm value is slightly left-skewed, implying a tendency toward higher values, while the kurtosis of 3.191 indicates a distribution slightly more peaked than a normal distribution. The Jarque-Bera statistic of 16.611 with a p-value of 0.0002 suggests that FV is not normally distributed, which may have implications for parametric analysis.

Table 2. Descriptive Statistics

	Mean	Maxi	Min	Std.De	Skew	Kurt	J-Bera	Prob	Obs
FV	0.37964	0.54455	0.13928	0.06952	-0.66628	3.19063	16.6106	0.00024	130
	9	1	2	6		3	1	7	
ED	0.30596	0.91666	0.08333	0.15347	1.29575	4.08397	72.3334	0.00000	130
Q	8	7	3	4	5	2	1	0	
SD	0.30067	0.70588	0.05882	0.13614	0.08828	2.53259	2.28835	0.31848	130
Q	0	2	3	6	3	9	8	5	
GD	0.21310	0.26470	0.14705	0.02519	-0.4048	2.46659	8.61631	0.01345	130
Q	2	6	9	8		9	7	8	
BG	0.61895	0.97800	0.12200	0.24053	-0.53285	2.01654	19.2766	0.00006	130
D	9	0	0	5		5	0	5	

Source: Eview Output, 2026

Environmental disclosure quality (EDQ) shows a mean of 0.306, a standard deviation of 0.153, and a wide range from 0.083 to 0.917, reflecting substantial heterogeneity in environmental reporting practices among the firms. The positive skew of 1.296 indicates that most firms have lower environmental disclosure scores, with a few firms exhibiting very high levels of disclosure. Kurtosis of 4.084 suggests a leptokurtic distribution with heavy tails, while the Jarque-Bera statistic of 72.333 ($p < 0.001$) confirms non-normality. This aligns with expectations in emerging markets where environmental reporting remains uneven.

Social disclosure quality (SDQ) has a mean of 0.301, a minimum of 0.059, and a maximum of 0.706, with moderate dispersion (Std. Dev. = 0.136). The skewness of 0.088 and kurtosis of 2.533 indicate that SDQ is approximately symmetric and mesokurtic, and the Jarque-Bera statistic of 2.288 ($p = 0.318$) suggests that the social disclosure scores are normally distributed. This relative normality implies that social disclosures are more uniformly adopted across firms compared with environmental disclosures.

Governance disclosure quality (GDQ) exhibits a mean of 0.213 and a narrow standard deviation of 0.025, suggesting limited variability in governance reporting across the sampled firms. The negative skew (-0.405) indicates a slight tendency toward higher governance scores, while kurtosis of 2.467 reflects a somewhat flatter distribution than normal. The Jarque-Bera statistic of 8.616 with a p-value of 0.013 indicates mild deviation from normality. The low variance in GDQ may reflect standardized or compliance-driven governance reporting practices in Nigerian industrial goods companies.

Board gender diversity (BGD) has a relatively high mean of 0.619 and a wide range from 0.122 to 0.978, indicating significant variation in female representation on boards across firms. The standard deviation of 0.241, coupled with a negative skew (-0.533) and kurtosis of 2.017, suggests a distribution moderately concentrated toward higher female representation. The Jarque-Bera statistic of 19.277 ($p < 0.001$) confirms non-normality, indicating that while many firms have substantial female participation, a few firms have very low board diversity.

The correlation matrix in Table 3 provides insights into the bivariate relationships among firm value (FV), environmental disclosure quality (EDQ), social disclosure quality (SDQ), governance disclosure quality (GDQ), and board gender diversity (BGD) for the sampled industrial goods companies. Environmental disclosure quality (EDQ) exhibits a strong negative correlation with firm value ($r = -0.727$, $p < 0.001$). This indicates that higher levels of environmental disclosure are associated with lower firm value, suggesting that firms with extensive environmental reporting may face higher compliance costs, regulatory scrutiny, or perceived operational inefficiencies. The strong significance of this relationship underscores the relevance of controlling for EDQ in regression analyses when examining determinants of firm valuation.

Table 3. Correlation Matrix

Correlation Probability	FV	EDQ	SDQ	GDQ
EDQ	-0.726779 0.0000			
SDQ	-0.051785 0.4447 0.0000	0.060242 0.3739	0.0034	
GDQ	-0.083034 0.2199	-0.011987 0.8597	0.097570 0.1492	
BGD	-0.188851 0.0049	0.128317 0.0574	-0.038446 0.5706	0.230448 0.0006

Source: Eview Output, 2026

Social disclosure quality (SDQ) shows a weak and statistically insignificant negative correlation with firm value ($r = -0.052$, $p = 0.445$). This implies that, in isolation, social disclosures do not have a meaningful linear relationship with firm valuation in this sample, although prior literature suggests that social reporting may have value-enhancing effects when combined with other governance mechanisms (Chen, Liu & Su, 2020). SDQ is slightly positively correlated with EDQ ($r = 0.060$), but this relationship is not statistically significant ($p = 0.374$), indicating that firms' environmental and social reporting practices are not strongly coupled. Governance disclosure quality (GDQ) exhibits a weak negative correlation with firm value ($r = -0.083$, $p = 0.220$) and shows minimal association with EDQ ($r = -0.012$, $p = 0.860$) and SDQ ($r = 0.098$, $p = 0.149$). These low and mostly insignificant correlations suggest that governance disclosures, measured in this sample, do not have a strong linear relationship with firm value or with other disclosure dimensions. This pattern may reflect standardized or compliance-focused governance reporting practices, which provide limited differentiation among firms.

Board gender diversity (BGD) demonstrates a moderate negative correlation with firm value ($r = -0.189$, $p = 0.005$), indicating that higher female representation on boards is modestly associated with lower firm value in a simple bivariate context. However, BGD shows

weak positive correlations with EDQ ($r = 0.128$, $p = 0.057$) and GDQ ($r = 0.230$, $p = 0.001$), suggesting that gender-diverse boards are somewhat more likely to be associated with stronger environmental and governance disclosures. The correlation with SDQ is very weak and statistically insignificant ($r = -0.038$, $p = 0.571$), indicating minimal association with social disclosure in a bivariate sense.

The regression results presented in Table 4 examine the moderating effect of board gender diversity (BGD) on the relationship between disclosure quality dimensions (environmental, social, and governance) and firm value (FV) among listed industrial goods companies in Nigeria. The model demonstrates a very high explanatory power, with an R-squared of 0.937 and an adjusted R-squared of 0.934, indicating that approximately 93.4% of the variation in firm value is explained by the independent variables and their interactions with board gender diversity. The F-statistic of 345.888 ($p < 0.001$) confirms that the overall model is statistically significant, demonstrating a strong fit and the reliability of the estimated coefficients. The Durbin-Watson statistic of 1.846 suggests no serious autocorrelation issues, supporting the robustness of the results.

Table 4. Regression Results

Dependent Variable: FV				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BGD	0.096336	0.036875	2.612491	0.0096
EDQ*BGD	0.000987	0.030140	0.032732	0.9739
SDQ*BGD	0.118800	0.027666	4.294100	0.0000
GDQ*BGD	0.274770	0.152095	1.806573	0.0723
F-statistic	345.8881	R-squared		0.936804
Prob(F-statistic)	0.000000	Adjusted R-squared		0.934096
Durbin-Watson stat	1.846309			

Source: Eview Output, 2026

Focusing on the direct moderating effect of board gender diversity, the coefficient for BGD is positive and statistically significant ($\beta = 0.096$, $p = 0.010$). This indicates that firms with greater gender diversity on their boards are associated with higher firm value, consistent with prior research suggesting that diverse boards improve monitoring, strategic decision-making, and stakeholder engagement, thereby enhancing firm performance (Shleifer & Vishny, 1997; Uwuigbe et al., 2022).

Regarding the interaction effects, the moderating influence of board gender diversity on environmental disclosure quality (EDQ*BGD) is virtually zero ($\beta = 0.001$, $p = 0.974$) and statistically insignificant. This suggests that board gender diversity does not materially influence the relationship between environmental disclosure and firm value in this sample. This finding may reflect the high costs or regulatory burdens associated with environmental reporting in the Nigerian industrial goods sector, where the strategic benefits of disclosure are not fully recognized by investors in the short term (Eccles, Ioannou & Serafeim, 2014).

Conversely, the interaction between social disclosure quality and board gender diversity (SDQ*BGD) is positive and highly significant ($\beta = 0.119$, $p < 0.001$). This indicates that board gender diversity strengthens the positive impact of social disclosure on firm value, suggesting that female board members enhance the credibility, implementation, and market perception of socially responsible practices. This aligns with prior studies demonstrating that diverse boards are more likely to support corporate social responsibility initiatives and ensure

that social reporting translates into measurable stakeholder and shareholder value (Chen, Liu & Su, 2020; Lawal, Igbekoyi & Dagunduro, 2024).

The interaction between governance disclosure quality and board gender diversity (GDQ*BGD) is positive but marginally significant ($\beta = 0.275$, $p = 0.073$), indicating a potential moderating effect that does not meet conventional levels of statistical significance. While this suggests that gender-diverse boards may slightly amplify the effectiveness of governance disclosures in creating firm value, the weak significance implies that governance reporting in Nigerian industrial goods firms may be more standardized or compliance-driven, providing limited differentiation among firms (Cuervo-Cazurra, Maloney & Manrakhan, 2007).

V. Conclusion

This study examined the moderating role of board gender diversity on the relationship between Environmental, Social, and Governance (ESG) disclosure quality and firm value among listed industrial goods companies in Nigeria. Using panel data from 2016 to 2025 and applying cross-section random effects regression analysis, the study provided robust empirical evidence on how board gender diversity interacts with different ESG dimensions to influence firm valuation. The study confirms that board gender diversity plays a dimension-specific role in enhancing the value relevance of ESG disclosures, particularly social reporting, and underscores the importance of strategic governance in leveraging sustainability initiatives for firm value creation.

Based on the findings, several practical recommendations emerge for corporate managers, regulators, and policymakers: Firms should carefully design environmental reporting to emphasize tangible risk mitigation, operational efficiency, or sustainability improvements. Indiscriminate or excessively detailed environmental disclosures may impose costs or negatively affect investor perceptions. Regulators could provide sector-specific ESG disclosure guidelines to enhance clarity, comparability, and investor confidence.

Firms with gender-diverse boards should actively support and communicate social responsibility initiatives, integrating social reporting into strategic planning and stakeholder engagement frameworks. This will enhance the credibility and market impact of social disclosures, aligning corporate sustainability efforts with value creation.

While governance reporting alone has limited direct impact on firm value, firms should link disclosures to concrete actions, such as internal controls, risk management, and ethical compliance practices. Regulators should encourage adoption of standardized governance reporting frameworks to improve comparability and stakeholder trust.

Firms should adopt a dimension-specific approach, focusing on the ESG areas most valued by investors, while ensuring transparency, credibility, and alignment with stakeholder interests. This may involve tailoring disclosures to highlight measurable outcomes, particularly in social and environmental domains.

Policymakers and regulators should recognize the moderating role of board gender diversity in enhancing ESG value relevance. Incentives could be provided to encourage greater female representation on boards, particularly in sectors where ESG practices directly affect firm value.

Investors should be guided to interpret ESG disclosures critically, understanding that board diversity can enhance the credibility and effectiveness of social disclosures, while environmental and governance disclosures may require careful evaluation in sector-specific contexts.

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