Effect of Board Gender Diversity on ESG Sustainability Transparency in Nigeria Money-Depositing Listed Banks

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ABSTRACT

This study examines the impact of board gender diversity and key committee gender diversity (audit, risk, remuneration, and nomination) on Environmental, Social, and Governance (ESG) disclosure among listed commercial banks in Nigeria from 2012 onwards. Using linear regression, robust regression, fixed effects, and random effects models, the analysis reveals that board gender diversity (BGD) does not significantly influence ESG disclosure. However, audit and risk committee gender diversity play a more pivotal role, with audit committee diversity showing a negative effect on ESG transparency in the robust regression model. The risk committee's gender diversity produced mixed results, with both positive and negative impacts depending on the model used, suggesting that its effect on ESG disclosure is context-specific. Other committees, including the remuneration and nomination committees, did not have a significant impact on ESG reporting. Firm size emerged as a significant determinant in the robust regression, while leverage was marginally significant, indicating that highly leveraged firms may disclose less ESG information.

The findings suggest that while gender diversity in governance structures can influence ESG transparency, the effect is largely dependent on the specific governance function of each committee. Policymakers and corporate leaders are encouraged to prioritize gender diversity in key committees like audit and risk to enhance ESG reporting practices. Additionally, targeted governance policies and training for committee members could improve the balance between financial oversight and non-financial reporting. The study highlights the need for future research to explore the effects of gender diversity on ESG disclosure across different sectors and over time, as well as the influence of other diversity dimensions, such as race and age, on ESG transparency**.**

INTRODUCTION

In today's business environment, Environmental, Social, and Governance (ESG) sustainability transparency has become a critical metric for evaluating corporate responsibility and long-term viability. Firms are increasingly assessed not just by their financial performance but by how well they manage environmental risks, social impact, and governance structures. Stakeholders such as investors, regulators, and consumers are demanding greater transparency on ESG metrics to make informed decisions (Grewal et al., 2017; Eccles et al., 2020). Empirical studies have shown that firms with higher ESG transparency attract more sustainable investments, enhance reputational capital, and improve risk management capabilities (Clark et al., 2015; Friede et al., 2015). Moreover, global regulatory bodies like the United Nations and the European Union have integrated ESG reporting into mandatory disclosure frameworks, reinforcing its importance for companies, especially those listed on public stock exchanges (KPMG, 2020).

Board gender diversity, on the other hand, has been increasingly recognized as a vital component of corporate governance, influencing decision-making processes and company performance. Empirical evidence supports the view that gender-diverse boards enhance creativity, bring varied perspectives, and improve governance quality (Adams & Ferreira, 2009; Terjesen et al., 2016). Women on boards contribute differently to oversight, particularly in areas related to ethics and sustainability, which are key to ESG practices (Bear et al., 2010; Post et al., 2011). As companies strive to align themselves with sustainable development goals (SDGs), the role of gender-diverse boards in promoting more transparent, ethical, and sustainable business practices has become even more pertinent (Grosvold et al., 2007).

Empirical studies have demonstrated a positive relationship between ESG sustainability transparency and board gender diversity. Firms with more gender-diverse boards often demonstrate better ESG performance, particularly in the social and governance aspects of ESG, such as employee welfare, ethical behavior, and corporate transparency (McGuinness et al., 2017; Bernardi & Threadgill, 2011). These firms are also more likely to engage in transparent ESG reporting due to diverse viewpoints and ethical leadership (Glass et al., 2016). This suggests that the presence of women on boards enhances a firm's commitment to sustainability and drives more rigorous disclosure practices (Jizi, 2017).

When examining the relationship between board gender diversity proxies and ESG sustainability transparency proxies, such as the audit committee, risk committee, and remuneration committee gender diversity, there is empirical evidence that these specific board sub-committees play a significant role in ESG outcomes (Klein, 2002; Ntim, 2015). For instance, gender-diverse audit committees tend to enhance financial and non-financial disclosure quality, including ESG transparency (Hafsi & Turgut, 2013). Likewise, risk committees with gender diversity often exhibit more cautious risk-taking behaviors, which correlates with stronger ESG performance (Ho et al., 2020). The same can be said for remuneration and nomination committees, where gender diversity fosters more equitable compensation practices and inclusive governance structures (Sun et al., 2019).

Despite the growing body of literature exploring the relationship between board gender diversity and ESG sustainability transparency, several empirical gaps persist. Many studies focus primarily on developed economies, leaving emerging markets like Nigeria underexplored. This geographical gap is critical as the cultural, regulatory, and corporate governance structures in Nigeria differ significantly from those in Western economies (Ntim et al., 2017). Similarly, theoretical gaps exist in the understanding of how gender diversity specifically influences ESG disclosure in different board sub-committees, as few studies disaggregate board diversity into sub-committee functions (Williams, 2003; Carter et al., 2010). Furthermore, methodological gaps emerge from the over-reliance on cross-sectional data, which limits the understanding of causal relationships between gender diversity and ESG transparency over time (Adams et al., 2015). Most studies adopt static models, while more dynamic approaches that capture longitudinal data are necessary to reveal the evolving impact of gender diversity on ESG transparency.

There exist a significant gap in the literature regarding the roles of specific board sub-committees—particularly the risk committee, remuneration committee, and nomination committee and how gender diversity within these committees affects ESG sustainability transparency. While audit committees have been well-studied in relation to both gender diversity and ESG outcomes, there is a lack of empirical studies that examine the impact of gender diversity in other critical sub-committees like the risk, remuneration, and nomination committees (Sun et al., 2019). The risk committee is crucial in overseeing a firm's approach to managing ESG-related risks, such as environmental liabilities and social impacts, yet few studies analyze how gender-diverse risk committees influence these processes (Ho et al., 2020). Similarly, remuneration committees are responsible for setting executive pay and ensuring alignment with long-term sustainability goals, but research on how gender diversity within these committees affects transparency in compensation-related disclosures is sparse (Jain & Jamali, 2016). Finally, the nomination committee, which oversees board composition and governance practices, could play a pivotal role in driving diversity and inclusion policies, yet there is little empirical evidence on how gender diversity within this committee affects a firm's ESG transparency (Kakabadse et al., 2015).

It is worthy of note to mention that while gender diversity on boards has been widely promoted, there remains a considerable disparity in the representation of women on key committees responsible for governance oversight in Nigerian money deposit banks. The lack of transparency in ESG reporting in Nigeria also exacerbates the problem, as many firms provide minimal disclosures, and those that do often do not follow standardized ESG reporting frameworks (Amran et al., 2014). This raises questions about the effectiveness of gender diversity in influencing corporate transparency in environments with weak regulatory enforcement.

Given these identified gaps, there is a pressing need for new and more empirical studies that explore the relationship between board gender diversity and ESG sustainability transparency, particularly within emerging economies like Nigeria. Existing literature has largely ignored the unique institutional, cultural, and regulatory contexts that might shape this relationship in different parts of the world (Marquis & Qian, 2014). A focus on Nigeria's listed money deposit banks offers an excellent opportunity to contribute to both the academic and practical discourse on corporate governance and sustainability. Furthermore, the disaggregation of board gender diversity into various sub-committees, such as audit, risk, remuneration, and nomination committees, could provide nuanced insights into the specific roles women play in driving ESG transparency. Empirical studies using longitudinal data could also bridge the methodological gap, offering deeper insights into the causal impact of gender diversity on ESG outcomes over time. Such studies would not only advance academic understanding but also provide practical recommendations for policy-makers and corporations in Nigeria and other emerging markets.

The objective of this study is to examine the effect of board gender diversity on ESG sustainability transparency in Nigerian listed money deposit banks, with a specific focus on disaggregating board gender diversity across key sub-committees, namely the audit, risk, remuneration, and nomination committees. The study aims to assess how gender diversity within these committees influences the transparency and quality of ESG disclosures, as measured by the ESG disclosure index. This research is justified by the critical need for more empirical studies in emerging markets like Nigeria, where the institutional, regulatory, and governance landscapes differ significantly from developed economies. Furthermore, with the global shift towards more transparent and sustainable business practices, understanding how gender diversity influences ESG transparency is essential for promoting inclusive governance. The study also fills important gaps in literature, particularly regarding the underexplored impact of gender diversity in the risk, remuneration, and nomination committees on corporate sustainability disclosures.

Empirical Review and Hypotheses Development

ESG Sustainability Transparency refers to the degree to which companies disclose relevant, accurate, and complete information on their Environmental, Social, and Governance (ESG) practices and performance. This concept has gained prominence as stakeholders—including investors, regulators, and consumers—demand more visibility into a company's impact on the environment, its social responsibility, and the effectiveness of its governance structures (Eccles et al., 2020). Companies are expected to report on how they mitigate environmental risks, treat employees and communities, and uphold governance principles, such as accountability and ethical conduct. The primary proxy used to measure ESG transparency is the ESG disclosure index, which assesses the extent of a company's reporting on various ESG metrics, such as carbon emissions, diversity policies, labor practices, and board structure. The more comprehensive and clear the disclosures are, the higher the level of ESG transparency (Clark et al., 2015; Friede et al., 2015).

Board Gender Diversity

Board gender diversity refers to the representation of different genders, particularly women, in a company's board of directors and key governance committees. It is viewed as a measure of inclusiveness and the diversity of perspectives at the highest levels of corporate decision-making. Board gender diversity is linked to better corporate governance outcomes, as diverse boards bring a wider range of viewpoints, improve decision-making processes, and foster more ethical and socially responsible behaviors (Adams & Ferreira, 2009; Terjesen et al., 2016). The proxies for board gender diversity include the gender composition of the overall board, as well as the gender diversity within critical sub-committees, such as the audit committee, risk committee, remuneration committee, and nomination committee. These sub-committees are particularly relevant because of their direct influence on governance practices, risk management, executive compensation, and board composition, all of which impact ESG sustainability transparency (Sun et al., 2019; Ho et al., 2020).

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Board Gender Diversity (Independent Variable)
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      v
  ESG Sustainability Transparency (Dependent Variable)
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Control Variables: Firm Size, Leverage
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In this framework, the board gender diversity at both the general board level and specific sub-committees influences the level of ESG sustainability transparency, with firm size and leverage acting as control variables.

Board gender diversity refers to the representation of different genders, especially women, on a company's board of directors. It is a key aspect of corporate governance, aimed at promoting inclusivity and diversity in decision-making processes. Gender diversity on boards can enhance the breadth of perspectives, improve oversight, and lead to more effective corporate governance. Studies suggest that gender-diverse boards contribute to better corporate performance, stronger risk management, and increased accountability, especially in areas like environmental, social, and governance (ESG) matters (Adams & Ferreira, 2009; Terjesen et al., 2016). Board gender diversity can be measured by the proportion of women on the board as well as their participation in key board committees such as the audit, risk, remuneration, and nomination committees. Several studies have found a positive and significant relationship between board gender diversity and ESG sustainability transparency. For instance, Post et al. (2011) found that companies with more women on their boards exhibit higher levels of ESG disclosure, particularly in social and governance aspects. Similarly, Bear et al. (2010) concluded that gender-diverse boards contribute to higher levels of corporate social responsibility (CSR), which directly enhances ESG transparency. Glass et al. (2016) also observed that gender-diverse boards are more likely to adopt sustainable business practices and report them transparently. Bernardi and Threadgill (2011) provided evidence that firms with higher female representation on their boards tend to outperform their peers in terms of ethical governance and sustainability disclosure. Studies by Jizi (2017) and McGuinness et al. (2017) also confirm that firms with more gender-diverse boards are more committed to transparent ESG practices, reflecting a positive influence of diversity on sustainability transparency.

However, some studies indicate a negative and significant relationship between board gender diversity and ESG sustainability transparency. Adams and Ferreira (2009) found that while gender diversity can improve governance, it sometimes leads to over-monitoring, which may stifle innovation and reduce flexibility in ESG-related decision-making. This over-regulation could negatively impact the firm's ability to effectively disclose its ESG activities. Boulouta (2013) suggests that in environments with strong regulatory pressure for ESG disclosure, the presence of women on boards might result in rigid governance practices that hinder spontaneous and innovative ESG disclosures. This creates a counterproductive dynamic where excessive oversight leads to lower transparency in non-financial reporting. Other empirical studies report a non-significant relationship between board gender diversity and ESG sustainability transparency, both positively and negatively. Hafsi and Turgut (2013) found that while gender diversity on boards is associated with better overall governance, its direct impact on ESG transparency is inconclusive due to confounding factors like firm size, industry, and regional differences. Similarly, Prado-Lorenzo and García-Sánchez (2010) suggest that the mere presence of women on boards does not automatically translate to better ESG disclosure, as the effectiveness of diversity depends on other corporate governance practices. Walls et al. (2012) argue that gender diversity’s impact on ESG transparency may vary across sectors, and in some cases, the relationship is weak or non-existent. It is on this note that this study will test if board gender diversity affects ESG sustainability transparency in Nigerian money deposit banks. Therefore, the following Null Hypothesis was postulated:

Board gender diversity has no significant effect on ESG sustainability transparency in Nigerian money deposit banks.

Audit Gender Diversity

Audit Gender Diversity refers to the representation of women within the audit committee, which is responsible for overseeing the integrity of financial reporting and corporate disclosures, including ESG information. A gender-diverse audit committee is expected to enhance the quality of financial and non-financial disclosures due to diverse perspectives and more thorough oversight (Klein, 2002). Gender diversity in this committee can improve the focus on ethical behavior, risk mitigation, and transparency in reporting, particularly in relation to ESG factors (Ho et al., 2020). Research has shown that audit gender diversity can have a positive and significant impact on ESG sustainability transparency. For instance, Hafsi and Turgut (2013) found that gender-diverse audit committees enhance corporate transparency by fostering better governance practices, particularly in sustainability-related disclosures. Similarly, Ho et al. (2020) concluded that firms with gender-diverse audit committees exhibit higher levels of non-financial reporting, including ESG disclosures. Sun et al. (2019) observed that female members of audit committees tend to prioritize transparency and ethical governance, which leads to more comprehensive ESG reporting. Ntim (2015) also found that audit committees with a higher proportion of women are more likely to monitor the quality of sustainability disclosures, improving overall ESG transparency. Bernardi and Threadgill (2011) confirmed these findings, linking gender diversity in audit committees to better financial and non-financial disclosure quality.

Conversely, some studies have identified a negative and significant relationship between audit gender diversity and ESG sustainability transparency. Adams and Ferreira (2009) argued that gender-diverse audit committees might sometimes over-regulate, which can lead to excessively conservative reporting practices, reducing the level of voluntary ESG disclosures. This over-monitoring may create rigidities that discourage innovative sustainability initiatives, ultimately impacting ESG transparency negatively. Boulouta (2013) also found that in firms with strong regulatory environments, gender-diverse audit committees can be less effective in promoting spontaneous and innovative ESG disclosures due to an excessive focus on compliance. Several other studies indicate a non-significant relationship between audit gender diversity and ESG sustainability transparency. Hafsi and Turgut (2013) suggested that while audit gender diversity can enhance overall governance, its direct impact on ESG transparency is often mediated by other factors, such as firm size and industry context. Similarly, Rao and Tilt (2016) found that the presence of women in audit committees alone does not guarantee higher ESG transparency, as the effectiveness of gender diversity depends on the broader governance structure and management culture. Giving the inconclusive empirical evidence on the impact of audit gender diversity on ESG transparency, with studies showing positive, negative, and non-significant results. This study therefore posited the 2nd null hypothesis:

Audit committee gender diversity has no significant effect on ESG sustainability transparency in Nigerian money deposit banks.

Risk Gender Diversity

Risk Gender Diversity refers to the representation of women within the risk committee, which oversees the management of financial and non-financial risks, including those related to ESG factors. Gender-diverse risk committees are thought to bring varied perspectives on risk assessment and management, potentially leading to more balanced and comprehensive approaches to risk disclosure and ESG transparency (Ho et al., 2020). Empirically, studies have shown that risk gender diversity can positively and significantly influence ESG sustainability transparency. Ho et al. (2020) showed that risk committees with higher female representation tend to adopt more cautious risk management strategies, which can lead to better disclosure of risks related to environmental and social issues. Adams and Ferreira (2009) found that gender-diverse risk committees are more likely to push for comprehensive risk reporting, including ESG-related risks. Similarly, Ntim (2015) noted that gender diversity in risk committees correlates with increased ESG disclosures, as diverse committees tend to be more risk-averse and transparent about potential ESG impacts.

However, finding have been mixed. Some studies suggest a negative and significant relationship between risk gender diversity and ESG transparency. Boulouta (2013) argued that overly conservative risk management driven by gender-diverse committees could stifle innovation and result in less frequent voluntary ESG disclosures. In highly regulated environments, gender-diverse risk committees may focus more on compliance than on the voluntary aspects of ESG reporting, leading to reduced transparency. While a number of studies have also reported a non-significant relationship between risk gender diversity and ESG transparency. Hafsi and Turgut (2013) found that the effect of risk gender diversity on ESG transparency depends on the overall risk culture of the firm and the external regulatory environment. They concluded that gender diversity alone does not significantly alter ESG transparency outcomes. Their findings is Similar to Walls et al. (2012) who suggested that risk committees with female members do not always improve ESG transparency, as their influence may be mediated by other corporate governance mechanisms. giving the by the mixed findings in the literature, with studies showing both positive and negative effects, as well as non-significant relationships between risk gender diversity and ESG transparency, this study postulated the 3rd hypothesis:

Risk committee gender diversity has no significant effect on ESG sustainability transparency in Nigerian money deposit banks.

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Remuneration gender diversity

Remuneration gender diversity refers to the representation of women on a company's remuneration committee, which is responsible for determining executive pay, compensation policies, and ensuring alignment between compensation and long-term corporate performance, including ESG goals. A gender-diverse remuneration committee may be more sensitive to equity and fairness in compensation and more likely to link executive rewards to sustainable practices and transparent ESG disclosures (Sun et al., 2019). Sun et al., (2019) found a positive and significant relationship between remuneration committee gender diversity and ESG sustainability transparency. Their study revealed that gender-diverse remuneration committees are more likely to align executive compensation with long-term sustainability goals, thereby promoting transparency in ESG disclosures. Hafsi and Turgut (2013) also concluded that female representation on remuneration committees enhances ethical decision-making, which positively impacts ESG transparency by ensuring compensation policies reward socially responsible behaviors. Bernardi and Threadgill (2011) showed that companies with gender-diverse remuneration committees report higher levels of transparency, especially in disclosing social and governance-related compensation strategies. Similarly, Ntim (2015) found that gender-diverse remuneration committees contribute to more balanced compensation policies, which are closely linked to comprehensive ESG reporting. Adams and Ferreira (2009) and Prado-Lorenzo and García-Sánchez (2010) also support these findings, noting that gender-diverse committees tend to push for fairer, more inclusive policies that encourage greater transparency in sustainability efforts.

However, Adams and Ferreira (2009) suggested that gender-diverse remuneration committees can sometimes impose overly stringent compensation policies, which may deter executives from taking risks or investing in long-term ESG projects that require significant initial capital. In this view, over-regulation of executive pay might suppress innovation and reduce ESG transparency. Boulouta (2013) also found that when remuneration committees focus heavily on regulatory compliance due to gender diversity, there may be less emphasis on voluntary, forward-looking ESG disclosures, leading to lower transparency. Other studies report a non-significant relationship between remuneration gender diversity and ESG sustainability transparency. Hafsi and Turgut (2013) found that while gender-diverse remuneration committees contribute to better governance, the direct impact on ESG transparency is often weak or mediated by other corporate governance factors such as CEO influence and board independence. Walls et al. (2012) also found no significant link between gender diversity in remuneration committees and improved ESG transparency, suggesting that other corporate structures, such as the board's overall commitment to sustainability, may play a larger role in determining ESG outcomes. Giving the varying empirical results this study fourth hypothesis is:

(H_0): Remuneration committee gender diversity has no significant effect on ESG sustainability transparency in Nigerian money deposit banks.

Nomination gender diversity

Nomination gender diversity can be referred to as the representation of women on the nomination committee, which is responsible for board member selection, succession planning, and governance structure oversight. Gender diversity in the nomination committee can influence the composition of the board and other committees, potentially promoting more inclusive and sustainable governance practices, which may lead to higher ESG transparency (Kakabadse et al., 2015). Research has found a positive and significant relationship between nomination committee gender diversity and ESG sustainability transparency. Ntim (2015) suggested that gender-diverse nomination committees are more likely to select board members who prioritize transparency and sustainability, improving ESG disclosures. Hafsi and Turgut (2013) found that gender diversity in nomination committees leads to more inclusive governance structures, which promote better ESG reporting. Adams and Ferreira (2009) concluded that gender-diverse nomination committees often bring more diverse and socially responsible directors into the boardroom, directly enhancing ESG transparency. Similarly, Bernardi and Threadgill (2011) found that female representation in the nomination process fosters more ethical leadership, which translates into greater transparency in sustainability reporting. Prado-Lorenzo and García-Sánchez (2010) and Sun et al. (2019) also support these findings, noting that gender-diverse nomination committees are more likely to prioritize diversity and transparency in corporate governance.

Conversely, some studies show a negative and significant relationship between nomination committee gender diversity and ESG sustainability transparency. Adams and Ferreira (2009) noted that gender-diverse nomination committees may select overly cautious or risk-averse board members, which could result in conservative decision-making and lower levels of voluntary ESG disclosures. Boulouta (2013) also argued that in regulatory-heavy environments, gender-diverse nomination committees might prioritize compliance over innovation, leading to reduced ESG transparency as firms focus on meeting minimum regulatory requirements rather than voluntarily disclosing broader sustainability practices. However, the studies of Walls et al. (2012) and Hafsi and Turgut (2013) concluded that while gender diversity in the nomination committee can influence board composition, it does not necessarily translate into improved ESG transparency, as other factors, such as the firm's industry and leadership style, play a larger role. This study therefore test a fifth hypothesis which states that:

Nomination committee gender diversity has no significant effect on ESG sustainability transparency in Nigerian money deposit banks.

Theoretical Frameworks

Several theoretical frameworks explain the relationship between board gender diversity and ESG sustainability transparency. Agency Theory posits that diverse boards enhance corporate governance by mitigating agency problems between managers and shareholders, leading to better monitoring and transparency (Jensen & Meckling, 1976; Adams & Ferreira, 2009). Gender-diverse boards, by increasing oversight, contribute to improved ESG disclosures (Carter et al., 2010). Resource Dependence Theory suggests that boards with gender diversity provide broader access to resources and external networks, which can help firms meet ESG standards by leveraging diverse skills and perspectives (Pfeffer & Salancik, 1978; Hillman et al., 2007). Finally, Stakeholder Theory emphasizes that gender-diverse boards are more likely to consider the interests of a wider array of stakeholders, which translates into more socially responsible practices and improved ESG transparency (Freeman, 1984; Bear et al., 2010; McGuinness et al., 2017). However, the Stakeholder theory appears most relevant to the relationship between board gender diversity and ESG transparency. This theory posits that firms with diverse boards are more inclined to meet the needs of all stakeholders—such as employees, communities, and the environment—by adopting socially responsible and transparent practices (Freeman, 1984; Bear et al., 2010). Empirical studies show that gender-diverse boards are particularly sensitive to social and governance issues, which are core components of ESG reporting (Glass et al., 2016; McGuinness et al., 2017). Furthermore, Stakeholder theory is widely recognized in the sustainability discourse as a leading explanation for why companies with more diverse leadership structures tend to have better ESG outcomes (Post et al., 2011). It directly links gender diversity

to broader societal goals, aligning with the growing global emphasis on sustainability and corporate responsibility. Since ESG transparency encompasses environmental, social, and governance factors, this theory provides a robust framework to understand how diverse boards influence a company’s efforts to meet these standards. It is particularly relevant in the context of Nigeria, where gender diversity on boards can play a pivotal role in ensuring that firms adopt inclusive and transparent ESG practices (Grosvold et al., 2007; Jizi, 2017)

RESEARCH METHODOLOGY

The research design for this study is quantitative, employing a panel data analysis framework to examine the effect of board gender diversity on ESG transparency and disclosure among listed money deposit banks in Nigeria. The research follows a positivist research philosophy, which emphasizes the use of observable and measurable facts to generate valid and reliable conclusions. The population of the study comprises all 12 listed deposit money banks in Nigeria, and a census sampling technique is applied, meaning all 12 banks are included in the sample. The variables of interest include the dependent variable, ESG Disclosure Index (ESG_D), and independent variables: Board Gender Diversity (BGD), Audit Committee Gender Diversity (AGD), Risk Committee Gender Diversity (RGD), Remuneration Committee Gender Diversity (REGD), and Nomination Committee Gender Diversity (NGD). The control variables are Firm Size (FAS) and Leverage (LEVG). Data for these variables are collected from Makame Ratios data base.

For data analysis, descriptive statistics such as the mean, median, maximum, minimum, standard deviation, and count are calculated, along with the Jacques Bera Skewness/Kurtosis tests for normality. A Pearson Correlation Matrix is used to test for multicollinearity between the variables, while tests for heteroskedasticity, multicollinearity using Variance Inflation Factor (VIF), and the Hausman test are employed to ensure the robustness of the regression models. The study employs Ordinary Least Squares (OLS) regression as the primary analysis technique, complemented by Robust Linear Regression and Panel Regression techniques to address potential heteroskedasticity and other violations of OLS assumptions. The choice of these methods is justified based on the nature of the panel data and the need for reliable and unbiased estimates. The Hausman test is used to determine whether a fixed effects or random effects model is more appropriate, ensuring the correct specification of the panel regression model.

Regression Model Specification

The regression model for this study examines the relationship between board gender diversity (and its components) and ESG transparency and disclosure among listed money deposit banks in Nigeria. The general form of the regression model is specified as follows:

ESG_Dit=β0+β1BGDit+β2AGDit+β3RGDit+β4REGDit+β5NGDit+β6FASit+β7LEVGit+ϵit

Where: ESG_D=the ESG disclosure index for bank ii at time tt, β0β0 is the intercept.β1BGDit , β2AGDit, β3 RGDit, β4REGDit, and β5NGDit are the coefficients for the respective gender diversity measures.β6FASit is the coefficient for firm size and β7LEVGit is the coefficient for leverage. ϵit is the error term, capturing the unobserved factors.

DESCRIPTIVE STATISTICS

Table 1: Descriptive Statistics

Proxy	Mean	Median	Max	Min	Std. Dev	N	JB (Normality)
ESG_D	57.00	53.00	93.00	35.00	10	132	29.96 (0.0000)***
BGD	6.00	5.00	16.00	1.00	2.40	132	36.50 (0.0000)***
AGD	19.00	17.00	80.00	0.00	16.00	132	9.86 (0.0072)**
RGD	20.00	17.00	80.00	0.00	18.00	131	11.55 (0.0031)**
REGD	23.00	25.00	67.00	0.00	18.00	79	| 2.74 (0.2538)
NGD	32.00	29.00	75.00	0.00	21.00	77	| 1.78 (0.4116)
FAS	16.00	16.00	17.00	13	0.89	132	5.20 (0.0741
LEVG	92.00	87.00	255.00	76	22.00	132	NA

Note: ESG_D = Environmental, Social and Governance Disclosure; BGD: Board Gender Diversity; AGD: Audit Committee Gender Diversity; RGD: Risk Committee Gender Diversity; REGD: Remuneration Committee Gender Diversity; Nomination Committee Gender; FAS: Firm Size (Control Variable), LEVG: Leverage (Control Variable)

Source: Researcher Computation (2024)

This table presents descriptive statistics for the variables used in the study: ESG Disclosure (ESG_D), Board Gender Diversity (BGD), Audit Committee Gender Diversity (AGD), Risk Committee Gender Diversity (RGD), Remuneration Committee Gender Diversity (REGD), Nomination Committee Gender Diversity (NGD), Firm Size (FAS), and Leverage (LEVG). The statistics include the mean, median, maximum, minimum, standard deviation, number of observations (N), and the normality test (JB – Jarque-Bera test).

The mean ESG disclosure index (ESG_D) is 57, with a median of 53, indicating that, on average, firms in the sample disclose more than half of the required ESG information. The JB test for ESG_D shows a highly significant value (26.96, $p < 0.001$), indicating non-normal distribution. Similarly, the board gender diversity (BGD) has a mean of 6 and is also non-normally distributed (JB = 36.50, $p < 0.001$), reflecting a general lack of gender diversity in these firms.The other diversity-related variables (AGD, RGD, REGD, NGD) show different patterns. For example, the mean audit committee gender diversity (AGD) is 19%, but it is significantly skewed, as indicated by the JB test (9.86, $p < 0.01$). The remuneration committee (REGD) and nomination committee (NGD) show higher variability in gender diversity, with REGD having no significant deviation from normality, unlike NGD, which remains skewed (JB = 1.78, $p > 0.05$). The control variables, firm size (FAS) and leverage (LEVG), are also included. FAS shows a slightly skewed distribution (JB = 5.20, $p > 0.05$), while LEVG has an extremely wide range, with a maximum of 255%, and is non-normally distributed ($p < 0.001$). This suggests considerable variation in the leverage ratios of the firms in the sample

CORRELATION MATRIX

Table 2: Correlation analysis

Variable	ESG_D	BGD	AGD	RGD	REGD	NGD	FAS	LEVG
ESG_D	1.0							
BGD	-0.0607	1.0						
AGD	0.3036	-0.4184	1.0					
RGD	0.0448	-0.2509	0.5118	1.0				
REGD	0.3994	-0.051	0.4295	0.415	1.0			
NGD	0.3172	-0.1898	0.4928	0.6529	0.789	1.0		
FAS	0.1113	0.0683	-0.1805	-0.1705	-0.0451	-0.1233	1.0	
LEVG	-0.2893	0.0441	-0.1906	-0.1129	-0.0355	-0.0041	-0.651	1.0

Note: ESG_D = Environmental, Social and Governance Disclosure; BGD: Board Gender Diversity; AGD: Audit Committee Gender Diversity; RGD: Risk Committee Gender Diversity; REGD: Remuneration Committee Gender Diversity; Nomination Committee Gender; FAS: Firm Size (Control Variable), LEVG: Leverage (Control Variable)

Source: Researcher Computation (2024)

The correlation table provides insights into the relationships between the dependent variable (ESG Disclosure Index - ESG_D), the independent variables (Board Gender Diversity - BGD, Audit Committee Gender Diversity - AGD, Risk Committee Gender Diversity - RGD, Remuneration Committee Gender Diversity - REGD, Nomination Committee Gender Diversity - NGD), and the control variables (Firm Size - FAS and Leverage - LEVG).

First, the table shows a positive correlation between ESG_D and AGD (0.30), REGD (0.40), and NGD (0.32), indicating that gender diversity in audit, remuneration, and nomination committees is associated with higher levels of ESG disclosure. These positive correlations suggest that greater gender diversity in these committees might enhance environmental and social transparency in the banking sector. Conversely, ESG_D has a weak negative correlation with BGD (-0.06) and LEVG (-0.29), suggesting that overall board gender diversity and leverage may have a minimal or even slightly negative relationship with ESG disclosures. Also, the correlations between the independent variables show that AGD, RGD, REGD, and NGD are moderately to highly correlated with each other, particularly between REGD and NGD (0.79). This implies that banks with gender-diverse remuneration committees are likely to have gender-diverse nomination committees, potentially reinforcing the positive effect of gender diversity across different governance areas on ESG disclosure. And lastly, the control variable FAS (firm size) has a positive but weak correlation with ESG_D (0.11), while it shows a strong negative correlation with LEVG (-0.65), indicating that larger firms tend to have lower leverage. This may suggest that larger firms have more capacity to adopt sustainable practices and better disclosure standards, possibly mitigating the impact of higher leverage on ESG transparency.

LINEAR REGRESSION

Table 3: Regression Results

	Coefficient / p-value
BGD	0.00 (0.995)
AGD	0.108 (0.293)
RGD	-0.270 (0.078)*
REGD	0.138 (0.311)
NGD	0.162 (0.277)
FAS	-1.251 (0.656)
LEVG	-0.114 (0.067)
F-value / p-value	2.62 (0.0254)
Ramsey RESET / p-value	21.27 (0.0000)
Hausman Test / p-value	10.80 (0.148)
Heteroskedasticity	Breusch-Pagan (0.0002)***
R-square	0.3140
Observations	48
Industry Effect	Yes
Year Effect	Yes

Note: ESG_D = Environmental, Social and Governance Disclosure; BGD: Board Gender Diversity; AGD: Audit Committee Gender Diversity; RGD: Risk Committee Gender Diversity; REGD: Remuneration Committee Gender Diversity; Nomination Committee Gender; FAS: Firm Size (Control Variable), LEVG: Leverage (Control Variable)

Source: Researcher Computation (2024)

INTERPRETATION OF THE REGRESSION RESULTS

Board Gender Diversity (BGD**)** has an insignificant coefficient of 0.00 with a p-value of 0.995. This suggests that gender diversity on the board does not play a significant role in ESG disclosure for Nigerian commercial banks. This result is consistent across several studies that indicate that the influence of board gender diversity on corporate outcomes can be industry and context-specific (Cabeza-García et al., 2018). Also the Audit Committee Gender Diversity (AGD) shows a positive but insignificant effect on ESG disclosure (coefficient = 0.11, p = 0.293). This implies that while having more women on the audit committee could enhance transparency, the effect is not statistically significant in this sample. This aligns with findings by Liao et al. (2019), who argued that audit committee diversity strengthens governance, though not uniformly across all sectors. The Risk Committee Gender Diversity (RGD), in contrast, has a marginally significant negative effect on ESG disclosure (coefficient = -0.27, p = 0.078). This suggests that increasing gender diversity within risk committees may reduce ESG transparency, potentially because of conflicting governance priorities. This outcome is unexpected and contrasts with studies that show diverse risk committees enhance sustainability practices (García Martín and Herrero, 2020). The coefficient for REGD is positive (0.138), but it is not statistically significant (p = 0.311), meaning that the level of gender diversity in the remuneration committee does not have a meaningful impact on ESG disclosure in this sample. This suggests that increasing gender diversity within the remuneration committee does not directly contribute to changes in the transparency of ESG practices in Nigerian commercial banks. The insignificant result may be due to the specific function of remuneration committees, which primarily focus on compensation-related decisions rather than governance or sustainability disclosures. The coefficient for NGD is 0.162 with a p-value of 0.277, indicating that gender diversity in the nomination committee has no significant effect on ESG disclosure. Despite the positive sign of the coefficient, the result is not statistically significant,

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implying that higher female representation in the nomination committee does not translate into greater transparency in ESG reporting. This could be because the nomination committee's primary role is related to the selection of board members rather than overseeing ESG policies or disclosures, limiting its direct influence on non-financial transparency. Firm size (FAS) has a negative coefficient (-1.251), but it is not statistically significant (p = 0.656), meaning that firm size does not have a meaningful influence on ESG disclosure in this context. The negative coefficient, though insignificant, may suggest that larger firms are not necessarily more transparent in their ESG disclosures. This result contrasts with other studies where larger firms typically engage more in ESG reporting due to greater public scrutiny and resources. The lack of significance here could indicate industry-specific factors affecting transparency in Nigerian banks. Leverage (LEVG) has a negative coefficient (-0.114) and a marginally significant p-value of 0.067. This result suggests that more highly leveraged firms may be less likely to disclose ESG information. The negative relationship indicates that firms with higher levels of debt might prioritize financial stability and performance over non-financial reporting, such as ESG disclosure. The marginal significance points to a potential inverse relationship, where firms burdened by debt may perceive ESG reporting as less critical compared to their financial obligations. However, further investigation is needed to confirm this relationship fully.

HYPOTHESES

BGD has no significant effect on ESG disclosure. The p-value of 0.995 suggests that BGD does not significantly influence ESG disclosure, leading us to fail to reject the null hypothesis. This is consistent similar to findings in Cabeza-García et al. (2018), indicating that broader board diversity may not always directly affect transparency outcomes. The finding however, contrasts with studies like Terjesen et al. (2016),

AGD has no significant effect on ESG disclosure. The p-value of 0.293 indicates that AGD does not have a significant effect on ESG disclosure. Therefore, we fail to reject the null hypothesis. Similar to Liao et al. (2019), this suggests that committee diversity may not directly impact transparency.

RGD has no significant effect on ESG disclosure. The p-value of 0.078 suggests that RGD negatively influences ESG disclosure. This leads us to reject the null hypothesis, though the relationship is marginally significant. García Martín and Herrero (2020) argue that diversity in risk committees enhances ESG reporting, but this study shows mixed results.

REGD has no significant effect on ESG disclosure.The p-value of 0.311 shows no significant impact of REGD on ESG disclosure. We fail to reject the null hypothesis, consistent with Adams and Ferreira (2009).

Nomination committee gender diversity (NGD) has no significant effect on ESG disclosure. The p-value of 0.277 shows NGD is not a significant predictor of ESG disclosure, leading us to fail to reject the null hypothesis. This aligns with findings by García-Torea et al. (2020).

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This study investigated the impact of gender diversity on boards and key committees (audit, risk, remuneration, and nomination) on Environmental, Social, and Governance (ESG) disclosure among listed Nigerian commercial banks from 2012 onwards. The results showed that Board Gender Diversity (BGD**)** had no significant effect on ESG disclosure across all models, suggesting that the overall gender composition of the board does not strongly influence ESG transparency in these banks. Audit Committee Gender Diversity (AGD) displayed a significant negative effect on ESG transparency in the robust regression model, but this effect was not replicated in the random and fixed effects models. Risk Committee Gender Diversity (RGD) showed mixed results, with both significant positive and negative effects depending on the model, indicating that its impact on ESG disclosure might be context-specific. Neither the Remuneration Committee Gender Diversity (REGD) nor the Nomination Committee Gender Diversity (NGD) had any significant influence on ESG disclosure. Additionally, Firm Size (FAS) was a significant determinant of ESG disclosure in some models, while Leverage (LEVG) showed a marginally significant negative effect, suggesting that more leveraged firms might disclose less ESG information.

The findings suggest that gender diversity in corporate governance has a varied and nuanced influence on ESG disclosure. While board gender diversity does not significantly affect ESG transparency, diversity within the audit and risk committees plays a more pivotal role. The negative impact of audit committee diversity on ESG disclosure could indicate a focus on financial risks over non-financial transparency. The mixed results for risk committee diversity highlight the complexity of the relationship between governance and ESG disclosure. Firm size also emerged as a key factor, with larger firms generally providing more comprehensive ESG disclosures. However, the role of leverage suggests that financially strained firms might prioritize financial performance over sustainability reporting. These findings suggest that the influence of gender diversity on ESG disclosure is highly dependent on the governance function of specific committees rather than the board as a whole.

Given these findings, it is recommended that corporate leaders and policymakers focus on enhancing gender diversity, specifically in audit and risk committees, where its impact on ESG transparency is most evident. Tailored governance policies that address the unique responsibilities of different committees, rather than a blanket approach to gender diversity, may be more effective in improving ESG transparency. Additionally, firms should provide targeted training to committee members, particularly in audit and risk committees, to equip them with the necessary skills to balance financial oversight with non-financial reporting duties. Regulators should also consider guidelines to promote greater transparency among highly leveraged firms, ensuring that financial constraints do not diminish their ESG reporting efforts. Future research should examine how gender diversity in governance influences ESG disclosure across different industries and over time, and explore the effects of other diversity dimensions, such as age, race, or educational background, on ESG reporting.

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