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Board Attributes and Environmental Reporting of Listed Consumer Goods Firms in Nigeria

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ABSTRACT

Despite growing global interest in environmental sustainability, corporate environmental reporting remains challenging particularly in emerging economies where governance structures influence transparency. The study examined the relationship between board attributes and environmental sustainability reporting among listed consumer goods firms in Nigeria. Specifically, it investigated the impact of board diversity, board size, and board independence on firms' environmental disclosures. Using a sample of 16 listed consumer goods firms on the Nigerian Exchange Group over the period 2014–2023, the study employed secondary data from annual reports and sustainability disclosures. The empirical analysis is conducted using pooled Ordinary Least Squares (OLS) regression to determine the effect of board attributes on environmental reporting. Findings revealed that board diversity and board size significantly enhance sustainability disclosures, suggesting that more diverse and larger boards contribute to improved environmental transparency. However, board independence does not exhibit a significant effect, indicating that the presence of independent directors alone may not be sufficient to drive sustainability reporting unless supported by strong governance mechanisms. These results aligned with stakeholder and resource dependence theories, emphasizing the role of governance structures in shaping corporate accountability. The study underscores the need for corporate managers and directors to prioritize board diversity and optimize board structures to enhance sustainability practices. Policymakers and regulators should introduce governance reforms that encourage greater gender representation and strengthen independent directors' influence on sustainability policies.

Keywords: Board Attributes, Environmental Sustainability Reporting, Board diversity, Board Size, Board Independence

1. INTRODUCTION

Environmental concerns have become central to corporate governance, with increased regulatory pressures and stakeholder expectations prompting firms to enhance their environmental sustainability reporting (ESR). Corporate boards play a critical role in shaping sustainability policies and disclosure practices, making board attributes a key determinant of environmental transparency. The stakeholder theory suggests that boards should be structured to consider the interests of various stakeholders, including regulators, investors, and environmental advocacy groups (Freeman et al., 2020). Similarly, resource dependence theory posits that board attributes, such as diversity, size, and independence, influence the quality of strategic decision-making, including sustainability reporting (Pfeffer & Salancik,

1978; Velte, 2023). Given the intensifying discourse on corporate sustainability, understanding how board characteristics shape environmental reporting remains crucial for scholars, policymakers, and corporate stakeholders.

Globally, corporate sustainability reporting has evolved into a core business practice, driven by international frameworks such as the Global Reporting Initiative (GRI), the Task Force on Climate-related Financial Disclosures (TCFD), and the Sustainability Accounting Standards Board (SASB) (Villalba-Ríos et al., 2022). These initiatives aim to standardize disclosures and enhance transparency regarding firms' environmental impact. In Europe, the European Green Deal and Corporate Sustainability Reporting Directive (CSRD) have made sustainability disclosures mandatory for large firms, reinforcing the role of board structures in ensuring compliance (Velte, 2022). Empirical evidence suggests that firms with well-structured boards are more likely to engage in robust environmental disclosures. Endrikat et al. (2020) found that board diversity and independence positively influence the breadth and depth of sustainability reporting among European firms, highlighting the role of governance in environmental transparency. However, some studies argue that board composition alone may be insufficient without strong institutional support (Sánchez et al., 2021).

Across Africa, sustainability reporting remains largely voluntary, although regulatory bodies are increasingly pushing for greater transparency. The African Integrated Reporting Council (AIRC) has promoted sustainability disclosure standards in line with international best practices, yet enforcement remains weak in many jurisdictions (Arayssi et al., 2020). Research suggests that board diversity, particularly gender diversity, improves environmental reporting among African firms. Amorelli and Sánchez (2020) found that firms with higher female board representation were more likely to disclose climate-related risks and sustainability initiatives. However, governance challenges, such as board entrenchment and weak enforcement mechanisms, often dilute the effectiveness of board oversight in driving sustainability disclosures (Zaid et al., 2019).

In the Sub-Saharan African context, corporate governance structures are often shaped by institutional voids, weak regulatory frameworks, and a high prevalence of family-owned businesses (Benjamin et al., 2019). Despite growing awareness of sustainability reporting, many firms lack the governance mechanisms needed to ensure comprehensive disclosures. Cucari et al. (2017) found that firms in Sub-Saharan Africa with independent and diverse boards were more transparent in their sustainability reporting. However, the effectiveness of board independence in driving ESG disclosures is sometimes compromised by dominant executive influence, where independent directors may lack the authority to enforce sustainability initiatives (Kanadlı et al., 2022).

In Nigeria, environmental disclosure remains at a nascent stage despite increasing regulatory pressures from the Financial Reporting Council of Nigeria (FRCN) and the Nigerian Stock Exchange (NGX). Many listed firms still provide minimal, boilerplate environmental disclosures (Rehman et al., 2020), with sustainability reporting often treated as a compliance exercise rather than a strategic imperative. Biswas et al. (2018) noted that while board attributes such as diversity and size have been linked to improved sustainability reporting in developed markets, their impact in Nigeria remains underexplored. Moreover, board independence remains a contested issue, as independent directors often face challenges in influencing corporate policies (Abad et al., 2017). Given these governance complexities, the role of board attributes in shaping sustainability disclosures among Nigerian listed firms warrants further empirical investigation.

Prior research has largely focused on developed markets, leaving a significant knowledge gap regarding board dynamics in emerging economies (Zaid et al., 2019). Furthermore, the mixed empirical evidence on board characteristics and sustainability disclosures necessitates further exploration. While some studies argue that larger, more diverse, and independent boards improve transparency (Velte, 2023), others suggest that governance effectiveness is contingent on regulatory frameworks and firm-specific characteristics (Villalba-Ríos et al., 2022). This study seeks to bridge these gaps by providing empirical insights into how board attributes—specifically board diversity, size, and independence—affect sustainability disclosures among consumer goods firms in Nigeria. Given Nigeria’s regulatory push

towards corporate sustainability, this study provides timely insights into whether governance reforms have translated into improved environmental disclosures (Kanadlı et al., 2022).

Compared to other settings, Nigeria presents a unique case for studying board attributes and sustainability reporting. Unlike developed markets where ESG disclosures are institutionally embedded, Nigerian firms operate in an environment where compliance remains largely voluntary, and board structures often reflect a mix of regulatory influence and entrenched corporate cultures (Rehman et al., 2020). Understanding the interplay between governance attributes and sustainability reporting in this setting provides contextualized insights that can inform policy formulation, corporate governance reforms, and investor decision-making (Endrikat et al., 2020). Furthermore, given the high environmental risks associated with consumer goods firms—such as waste generation, emissions, and resource consumption—examining their disclosure practices is both practically and academically significant (Velte, 2023).

The findings of this study contribute to the growing literature on corporate governance and sustainability reporting by providing empirical evidence on the effectiveness of board attributes in enhancing environmental transparency. By linking governance mechanisms to sustainability disclosures, this study aligns with stakeholder theory, which emphasizes the role of boards in balancing shareholder interests with broader environmental concerns (Freeman et al., 2020). Additionally, the study's findings have practical implications for policymakers and investors, highlighting whether regulatory efforts to improve governance structures are yielding tangible improvements in sustainability disclosures.

The rest of the paper is structured as follows: Section 2 presents the literature review, examining prior research on board attributes and environmental reporting. Section 3 outlines the methodology, detailing the sample selection, variable measurement, and estimation techniques. Section 4 discusses the empirical findings, linking them to existing theoretical frameworks. Finally, Section 5 concludes with policy implications, limitations, and directions for future research.

2. Literature Review

2.1 Environmental Sustainability Reporting

Environmental sustainability reporting (ESR) has gained prominence in corporate governance and sustainability discourse, serving as a mechanism for firms to disclose their environmental impact and sustainability initiatives. ESR is typically guided by standardized reporting frameworks such as the Global Reporting Initiative (GRI), which ensures transparency and comparability across firms. According to Villalba-Ríos et al. (2022), ESR refers to the systematic disclosure of environmental policies, programs, and outcomes in corporate reports. They argue that ESR is essential for firms to communicate their environmental stewardship to stakeholders and mitigate sustainability-related risks. However, their conceptualization is largely descriptive, focusing on the content of disclosures rather than the quality or reliability of the reported information. This limitation raises concerns about greenwashing, where firms provide disclosures to enhance their reputation without genuine environmental commitments. Sánchez et al. (2021) define ESR as the extent to which firms disclose verifiable and externally assured environmental information. They emphasize the role of assurance mechanisms in enhancing the credibility of ESR, suggesting that external audits and independent verification processes improve reporting quality. While this definition acknowledges the importance of assurance, it may overlook the actual environmental impact of the firm's activities, as high-quality reporting does not necessarily translate into strong environmental performance.

Chairina and Tjahjadi (2023) conceptualize ESR as an outcome of green governance—a governance structure that integrates environmental objectives into corporate decision-making. They propose that ESR should reflect not only a firm's disclosures but also its commitment to sustainability, as evidenced by board structures and policies. While their perspective is valuable, it is challenging to quantify green governance in a standardized manner, making cross-firm comparisons difficult. To measure ESR, several proxies have been proposed. Sánchez et al. (2021) suggest the use of assurance status, where firms with externally assured reports are assumed to provide higher-quality disclosures. However, assurance does not necessarily guarantee accuracy, as firms may selectively assure specific sections of their reports.

Villalba-Ríos et al. (2022) propose an index-based measure, using the GRI framework to score firms based on disclosed environmental indicators. This approach provides a structured measurement but may still be subject to selective reporting bias. Given these critiques, we adopt the GRI 2021 framework-based scoring approach, as it provides the most comprehensive and standardized measure of ESR.

2.2 Board Diversity

Board diversity is a fundamental aspect of corporate governance, encompassing demographic and cognitive differences among board members. It is often assessed through gender, ethnicity, education, and professional background diversity. Wu et al. (2021) define board diversity as the representation of individuals from different demographic groups, particularly women, on corporate boards. They argue that diverse boards bring varied perspectives that enhance strategic decision-making. However, their definition focuses narrowly on gender diversity, neglecting other forms of diversity that may equally impact governance effectiveness. Xiao-Ping and Jiang (2019) extend the concept by linking board diversity to innovative capacity, suggesting that diverse boards foster sustainability-oriented innovation. Their definition highlights the functional benefits of diversity, but it assumes that all forms of diversity contribute positively, which may not always be the case—excessive diversity can lead to coordination challenges and slower decision-making.

Kanadlı et al. (2022) emphasize the role of gender diversity in shaping sustainability practices, arguing that women directors are more likely to advocate for sustainability. While this argument aligns with prior research, it generalizes the behavioral tendencies of female directors, ignoring variations in individual leadership styles and industry-specific governance dynamics. In measuring board diversity, Wu et al. (2021) suggest a binary measure, where a firm is considered diverse if it has at least one female director. This threshold is simplistic and does not capture the degree of diversity. Kanadlı et al. (2022) propose using the percentage of female directors, which provides a more granular assessment. Given these considerations, we adopt the proportion of female directors on the board as the most appropriate proxy for board diversity.

2.3 Board Size

Board size refers to the total number of directors serving on a firm's board. It is a crucial determinant of board effectiveness, as it influences decision-making efficiency and oversight capacity. Endrikat et al. (2020) define board size as the number of directors responsible for governance and strategic decision-making. They suggest that larger boards offer a broader skill set, enhancing corporate accountability. However, they do not consider potential inefficiencies associated with large boards, such as slower decision-making and increased coordination costs. Velte (2023) conceptualizes board size as a function of corporate governance regulations, arguing that board size often reflects compliance rather than strategic necessity. While this perspective acknowledges regulatory influences, it does not account for firm-specific factors, such as industry complexity and ownership structure, that may necessitate different board sizes.

Hakimi et al. (2018) take a more functionalist view, stating that board size should be optimized rather than maximized, suggesting that an optimal size exists beyond which additional directors reduce efficiency. This definition is pragmatic, though it is difficult to determine an optimal size universally, as governance effectiveness varies across firms. In terms of measurement, Endrikat et al. (2020) and Velte (2023) use the absolute number of directors as a proxy for board size. This is straightforward and widely accepted. However, some studies propose alternative measures, such as the ratio of board members to firm size, which accounts for the relative scale of governance structures. Given the general acceptance of the absolute number of directors, we adopt this proxy for board size.

2.4 Board Independence

Board independence refers to the proportion of non-executive and independent directors on a corporate board, playing a critical role in governance oversight and managerial accountability. Zaid et al. (2019) define board independence as the presence of directors who are free from executive influence, ensuring objective decision-making. However, this definition does not consider cases where independent directors, despite their formal designation, may be socially or financially aligned with executives, thus compromising true independence. Benjamin et al. (2019) extend this definition by emphasizing the role of

independent directors in safeguarding stakeholder interests. While this is a compelling argument, their definition assumes that independent directors are always effective in promoting transparency, which may not hold in weak governance environments.

Arayssi et al. (2020) argue that board independence should be viewed as a measure of external control, where independent directors serve as external monitors to curb managerial excesses. This perspective aligns with agency theory, yet it overlooks board dynamics, such as the ability of independent directors to influence firm policies in the presence of dominant executive directors. To measure board independence, Zaid et al. (2019) propose a binary measure, categorizing boards as independent if they have a majority of independent directors. This approach is simplistic and does not capture variations in independence. Benjamin et al. (2019) suggest using the proportion of independent directors to total board members, which provides a more precise measure. Given these critiques, we adopt the percentage of independent directors as the most appropriate proxy.

2.5 Theory and Hypotheses Development

The relationship between board diversity and environmental sustainability reporting (ESR) is rooted in stakeholder theory, which posits that diverse boards are better equipped to address stakeholder concerns, including environmental issues (Freeman, 1984). The presence of diverse individuals, particularly women, is argued to enhance corporate social responsibility (CSR) practices, including sustainability disclosures, as they bring varied perspectives and ethical considerations to decision-making processes. Several empirical studies have examined this relationship, producing both supportive and contradictory evidence. Studies abound in terms of the link between board diversity and ESR. In terms of those that found a positive relationship, Wu et al. (2021) conducted a meta-analysis covering multiple regions and industries, concluding that gender-diverse boards significantly improve sustainability disclosures. They argued that female directors are more likely to advocate for sustainability initiatives due to their tendency toward stakeholder-oriented governance. Similarly, in Europe, Velte (2023) analyzed sustainability disclosures among European firms and found that firms with higher female board representation exhibited stronger environmental reporting practices. These findings support the notion that diversity fosters greater transparency in sustainability issues. However, their studies largely focus on gender diversity, overlooking other forms of diversity, such as ethnic and professional backgrounds.

In Asia, Rehman et al. (2020) examined listed firms and found a strong association between female board representation and the adoption of environmental management systems. They noted that gender-diverse boards were more likely to incorporate sustainability into corporate strategies. However, in contrast, Arayssi et al. (2020) found no significant link in Gulf Cooperation Council (GCC) countries, attributing the difference to weak regulatory frameworks and socio-cultural factors that limit the influence of women on boards. This suggests that institutional settings mediate the impact of board diversity on ESR, and the effectiveness of diverse boards may be context-dependent. Further, in Australia, Biswas et al. (2018) found that companies with diverse boards were more likely to establish sustainability committees, which enhanced ESR quality. They argued that female directors and directors from non-traditional backgrounds provided new insights that improved sustainability strategies. However, Cook et al. (2018) in the United States reported a neutral effect of board gender diversity on corporate disclosures, suggesting that while diversity may influence internal sustainability policies, its impact on external reporting is not always direct. While many studies emphasize a positive relationship, some report mixed findings. Kanadlı et al. (2022) noted that gender-diverse boards only improve ESR when independent directors hold significant influence. Their study implies that diversity alone is not sufficient; independent oversight and governance structures are necessary to translate board diversity into meaningful sustainability outcomes. Thus, we hypothesize that:

H1: Board diversity positively influences environmental sustainability reporting

The theoretical foundation for the relationship between board size and ESR lies in resource dependence theory, which suggests that larger boards bring diverse expertise and resources, potentially enhancing corporate sustainability initiatives (Pfeffer & Salancik, 1978). Larger boards may enhance monitoring and provide broader knowledge, facilitating more comprehensive sustainability reporting. However,

conflicting empirical evidence exists regarding this association. In Europe, Velte (2023) examined the impact of board size on ESR across multiple industries and found that larger boards were positively associated with enhanced sustainability disclosures. Their study argued that an increased number of directors brings diverse knowledge, strengthening firms' sustainability commitments. Similarly, Endrikat et al. (2020) conducted a meta-analysis and concluded that firms with larger boards exhibited greater sustainability transparency due to improved governance structures. However, they cautioned that beyond a certain threshold, larger boards may face coordination difficulties, which could diminish their effectiveness.

In contrast, Dong et al. (2019) studied Chinese firms and found an inverse relationship, arguing that excessively large boards tend to suffer from inefficiencies and slower decision-making, which hinders sustainability initiatives. They suggested that optimal board size is key, rather than simply increasing the number of directors. Similar findings were reported by Sánchez et al. (2021) in Spain, where they found that while moderate board expansion improved ESR, excessively large boards diluted accountability and reduced reporting quality. Supporting the positive link, Villalba-Ríos et al. (2022) found that larger boards in Latin America were associated with improved environmental reporting. However, they noted that this effect was only observed when sustainability expertise was present among board members. This aligns with Biswas et al. (2018), who found that board size only enhanced ESR when complemented by sustainability committees. Given these findings, it is evident that while larger boards can enhance sustainability reporting, excessive board expansion may lead to inefficiencies. Thus, we hypothesize that:

H2: Board size positively affects environmental sustainability reporting

The relationship between board independence and ESR is grounded in agency theory, which posits that independent directors mitigate managerial self-interest, thereby ensuring greater transparency and accountability (Fama & Jensen, 1983). Independent boards are expected to demand higher sustainability reporting standards as part of their oversight responsibilities. In support of this theory, Zaid et al. (2019) examined firms in the Middle East and found that independent boards were positively linked to sustainability disclosures. They argued that independent directors serve as external monitors who pressure management to disclose more comprehensive sustainability information. Similarly, Benjamin et al. (2019) found that firms with higher board independence demonstrated better environmental reporting, as independent directors were more likely to push for transparent sustainability strategies.

However, some studies present a more nuanced view. Kanadlı et al. (2022) found that independent directors improved ESR only when combined with strong gender diversity. Their study suggests that board independence alone may not be sufficient unless diversity fosters broader sustainability awareness. Similarly, Velte (2022) found that while independent boards were positively correlated with sustainability reporting in Europe, their influence was more pronounced when sustainability committees were in place. Conversely, Arayssi et al. (2020) reported a weak link in GCC countries, arguing that despite formal independence, independent directors often lack true autonomy due to complex ownership structures. Sánchez et al. (2021) supported this argument, finding that in some family-controlled firms, independent directors were appointed primarily for regulatory compliance rather than meaningful oversight. Despite mixed findings, a predominant view emerges: independent boards enhance ESR. Thus, we hypothesize that:

H3: Board independence positively influences environmental sustainability reporting

3. METHODS AND DATA

This study employs an ex post facto research design to examine the relationship between board characteristics and environmental sustainability reporting (ESR) among listed consumer goods firms in Nigeria. The population of the study comprises 21 consumer goods firms listed on the Nigerian Exchange Group, from which a purposive sampling technique was adopted to select a sample of 16 manufacturing firms. The purposive sampling approach ensures that only firms with publicly available sustainability reports and corporate governance disclosures within the study period are included, thereby enhancing the reliability of the dataset. The period under investigation spans from 2014 to 2023, covering ten years of

firm-level data. The study relies exclusively on secondary data sourced from annual reports, sustainability reports, and corporate governance disclosures of the sampled firms. The data analysis is conducted using the Pooled Ordinary Least Squares (OLS) regression technique, which is appropriate for estimating relationships in panel data settings where unobserved firm-specific effects are assumed to be homogenous (Wooldridge, 2019). The empirical model specification follows a linear functional form in which environmental sustainability reporting (ESR) is regressed on board size (BS), board diversity (BD), and board independence (BI), with the following econometric equation:

$$ESR_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BD_{it} + \beta_3 BI_{it} + \varepsilon_{it}$$

3.1 Variable Measurement

3.1.1 Dependent Variable

Environmental sustainability reporting (ESR), the dependent variable in this study, is operationalized using the Global Reporting Initiative (GRI) 2021 framework. The GRI 2021 framework provides a comprehensive standard for assessing corporate sustainability disclosures, ensuring comparability and consistency across firms (Global Reporting Initiative, 2021). The ESR score is computed based on the extent of disclosures related to environmental indicators, including energy consumption, greenhouse gas emissions, water usage, and waste management. Each firm's sustainability report is assessed using a content analysis approach, assigning a score based on the number of disclosed items relative to the total indicators under the GRI environmental reporting framework.

3.1.2 Independent Variables

Board size (BS) is measured as the total number of directors sitting on the board of a firm within a given year. This measurement is consistent with prior corporate governance literature that examines the influence of board size on firm performance and sustainability outcomes (Fama & Jensen, 1983; Yermack, 1996). Larger boards may enhance decision-making and oversight functions, potentially improving environmental disclosures (Zaid et al., 2020). Board diversity (BD) is operationalized as the proportion of female directors on the board. Gender diversity has gained considerable attention in governance literature as a key determinant of corporate social responsibility (CSR) and sustainability disclosures (Adams & Ferreira, 2009). Prior studies indicate that gender-diverse boards contribute to improved sustainability practices by fostering diverse perspectives and ethical decision-making (Post et al., 2011; Al-Shaer & Zaman, 2016). Board independence (BI) is measured as the proportion of independent non-executive directors relative to the total board size. Independent directors play a crucial role in ensuring corporate accountability and enhancing transparency in sustainability reporting (Rao & Tilt, 2016). The presence of independent directors is expected to strengthen oversight functions and mitigate agency problems, leading to higher levels of environmental disclosure (Khan et al., 2013).

4. RESULTS AND DISCUSSION

4.1 Descriptive Analysis

In Table 1, we find that environmental sustainability reporting (ESR), has a mean value of 0.168 with a standard deviation of 0.250. This suggests that, on average, environmental sustainability reporting among the sampled firms is relatively low. The high standard deviation indicates notable variability in the reporting practices, with values ranging from 0 to 1.000. In the case of the independent variables, we find that board diversity (BD) exhibits a mean of 18.469, with a considerable standard deviation of 14.160. This implies that the level of diversity within the boards of the sampled firms is moderately high, but there is substantial variation among firms. Board size (BS) shows a mean of 10.369, with a standard deviation of 3.036, indicating that the average number of board members is around 10, with some firms having as few as 4 members and others having up to 18. Board independence (BI) presents a mean of 74.121, suggesting that, on average, about 74% of board members across firms are independent. The standard deviation of 13.694, with a minimum value of 40.000 and a maximum of 93.330, reveals that

there is variation in the degree of independence, with some firms having significantly lower levels of independent directors than others.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
esr	160	0.168	0.250	0	1.000
bd	160	18.469	14.160	0.000	100.000
bs	160	10.369	3.036	4.000	18.000
bi	160	74.121	13.694	40.000	93.330

Source: Authors' computation (2025)

4.2.1 Correlation Analysis

The results of the Spearman Rank Correlation analysis in Table 2 show a positive association between environmental sustainability reporting (ESR) and board diversity (BD), with a correlation coefficient of 0.260, indicating a weak but positive relationship between the two variables. Additionally, the analysis shows a positive association between environmental sustainability reporting and board size (BS), with a correlation coefficient of 0.223. However, the correlation between environmental sustainability reporting and board independence (BI) is negative and very weak, with a coefficient of -0.004, indicating virtually no association between these two variables in the sample. In the case of the independent variables, the relationship between board diversity and board size is negative, with a coefficient of -0.037, showing a very weak inverse association. Similarly, board diversity and board independence have a weak negative association, with a correlation coefficient of -0.052. Lastly, there is almost no correlation between board size and board independence, as the coefficient is -0.015. These weak correlations suggest the absence of multicollinearity, as none of the relationships among the variables are strong.

Table 2: Correlation Results

Variables	(1)	(2)	(3)	(4)
(1) esr	1.000			
(2) bd	0.260	1.000		
(3) bs	0.223	-0.037	1.000	
(4) bi	-0.004	-0.052	-0.015	1.000

Source: Authors' computation (2025)

4.3 Regression Analyses

To analyze the cause-effect relationships between the dependent and independent variables and to test the formulated hypotheses, the study employed a pooled OLS regression, as the results indicated no presence of heteroscedasticity. The findings from the pooled OLS regression are presented and discussed below.

Table 3: Linear regression

esr	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
bd	0.004	0.001	3.34	0.001	0.002	0.007	***
bs	0.021	0.006	3.40	0.001	0.009	0.033	***
bi	0.002	0.001	1.31	0.194	-0.001	0.004	
Constant	-0.264	0.127	-2.07	0.040	-0.515	-0.012	**
VIF	1.00						
Hettest	1.65{0.600}						

Mean dependent var	0.168	SD dependent var	0.250
R-squared	0.127	Number of obs	160
F-test	7.591	Prob > F	0.000
Akaike crit. (AIC)	-4.191	Bayesian crit. (BIC)	8.110

**** p<.01, ** p<.05*

Source: Author' computation (2025)

Table 3 represents the results obtained from the estimation of the models using the OLS regression method. The results indicate that the dependent variable, environmental sustainability reporting, as captured by the regression model, has an R-Square value of 0.127. This suggests that the independent and control variables in the study account for approximately 12.7% of the systematic variation in the dependent variable during the period under study. The remaining 87.3% of the variation is explained by other factors not included in the model, as indicated by the error term. However, to further validate the estimates of the pooled OLS results, this study also tests for multicollinearity and heteroscedasticity. The analysis also includes a test for multicollinearity using the Variance Inflation Factor (VIF). The mean VIF for the variables in the OLS regression model is 1.00, which is well below the commonly accepted threshold of 10. This indicates that there is no severe multicollinearity among the independent variables, suggesting that they do not have high intercorrelations that would necessitate their exclusion from the model. The absence of multicollinearity enhances the reliability of the estimated coefficients. The assumption of homoscedasticity was tested using the Breusch-Pagan test, with the results showing an insignificant p-value (Hettest = 1.65, p=0.600). This indicates that the assumption of homoscedasticity holds, implying the absence of heteroscedasticity in the OLS regression model. Therefore, the standard errors of the estimates are reliable, and the statistical inferences drawn from the model are not biased due to heteroscedasticity.

The results obtained from the OLS regression model presented in Table 3 revealed that board diversity (BD) [coef. = 0.004 (p = 0.001)] has a significant positive effect on environmental sustainability reporting during the period under study. This indicates that an increase in board diversity is associated with an improvement in environmental sustainability reporting among the listed manufacturing firms in Nigeria. This finding implies that a more diverse board, encompassing various perspectives and experiences, enhances a firm's commitment to environmental sustainability practices. Such diversity may foster innovative solutions and greater accountability, aligning with the increasing recognition of sustainability as a crucial business imperative. This aligns with the findings of Abdulrahaman et al. (2022), who emphasized that diverse boards are better positioned to implement sustainable practices effectively. Similarly, Adegboyegun and Igbekoyi (2022) noted that diverse decision-making teams are more likely to consider environmental impacts seriously. Conversely, there are studies that suggest a more nuanced view of board diversity's impact. For example, Amarachi et al. (2024) argued that while diversity is beneficial, its effectiveness is contingent on the overall governance framework and firm culture.

Furthermore, we find that board size (BS) [coef. = 0.021 (p = 0.001)] has a significant positive effect on environmental sustainability reporting during the period under study. This suggests that larger boards are positively associated with higher levels of environmental sustainability reporting among the listed manufacturing firms in Nigeria. This finding implies that larger boards may bring a wider array of skills and expertise to sustainability initiatives, facilitating better oversight and governance. This perspective resonates with Rohaida et al. (2020), who found that firms with larger boards are more likely to pursue sustainability goals actively. Aladejebi (2021) also supports this notion, suggesting that the diversity of skills in larger boards allows for more comprehensive approaches to sustainability issues. However, some studies offer contrasting views on the relationship between board size and sustainability. For instance, Success et al. (2022) noted that excessively large boards could lead to inefficiencies and communication challenges, which might dilute the effectiveness of governance efforts regarding sustainability.

Also, board independence (BI) [coef. = 0.002 (p = 0.194)] does not have a significant effect on environmental sustainability reporting during the period under study, as the p-value exceeds the conventional significance level. This suggests that variations in board independence do not significantly influence environmental sustainability reporting among the listed manufacturing firms in Nigeria. This lack of significance suggests that having independent directors alone does not necessarily enhance a firm's commitment to sustainability. This aligns with findings from Ladini et al. (2024), who observed that independent directors often focus on financial performance rather than long-term sustainability objectives. Furthermore, the study by Abdulrahaman et al. (2022) underscores the idea that while independence is vital for governance, it must be accompanied by an organizational culture that values

sustainability to yield meaningful impacts. However, contrasting views exist, as indicated by Adegboyegun and Igbekoyi (2022), who argued that independent directors can drive sustainability initiatives when they possess the necessary influence and commitment to do so. This discrepancy highlights the importance of contextual factors in determining the effectiveness of board independence in promoting sustainability reporting.

5. CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between board attributes and environmental sustainability reporting among listed consumer goods firms in Nigeria. Drawing on stakeholder and resource dependence theories, the study investigated how board diversity, board size, and board independence influence the extent and quality of environmental disclosures. The findings provide empirical evidence that board diversity and board size are significant drivers of sustainability reporting, while board independence does not exhibit a statistically significant effect. These results suggest that firms with more diverse and larger boards are better positioned to enhance environmental transparency, reinforcing the argument that governance structures play a crucial role in shaping corporate sustainability practices. A key takeaway from this study is the critical role that board diversity plays in fostering sustainability reporting. The positive association between board diversity and environmental disclosures underscores the value of inclusive governance structures in enhancing firms' accountability to stakeholders. Gender-diverse boards, in particular, may bring broader perspectives and a heightened sensitivity to environmental concerns, leading to more robust sustainability practices. Similarly, the significant effect of board size on sustainability reporting highlights the potential benefits of larger boards in driving environmental transparency. A broader pool of directors may provide diverse expertise, which strengthens decision-making and governance oversight, ultimately promoting better sustainability reporting. However, the insignificance of board independence suggests that merely having independent directors may not be sufficient to influence sustainability disclosures unless accompanied by mechanisms that ensure their effectiveness in strategic decision-making.

The findings of this study have practical implications for corporate managers and directors seeking to enhance environmental sustainability reporting. Board composition should be strategically designed to reflect diversity in gender, expertise, and stakeholder representation, ensuring that sustainability issues receive adequate attention at the highest level of corporate decision-making. Given the observed significance of board size, firms should consider optimizing board structures to balance efficiency with governance effectiveness. While large boards may bring additional perspectives, excessive expansion could result in inefficiencies that dilute accountability. Furthermore, independent directors should be empowered with stronger mandates to influence corporate sustainability strategies rather than serving as mere regulatory compliance mechanisms. For policymakers and regulators, the results highlight the need for governance reforms that promote diverse and well-structured boards. Regulatory authorities should consider policies that encourage greater female representation on corporate boards and facilitate the inclusion of directors with expertise in environmental governance. In addition, mechanisms should be put in place to strengthen the role of independent directors, ensuring that they contribute meaningfully to corporate sustainability initiatives. Given the growing emphasis on ESG disclosures in global financial markets, Nigerian regulatory institutions should consider making sustainability reporting mandatory for listed firms to improve transparency and comparability across industries.

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