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Board Attributes And Environmental Disclosure Of Listed Consumer Goods Firms In Nigeria: A Moderating Effect Of Audit Quality

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ABSTRACT
This study examines the moderating role of audit quality in the relationship between board attributes and environmental disclosure among Nigerian consumer goods firms. Using panel data from six firms listed on the Nigeria Exchange Group between 2016 and 2023, the analysis employed descriptive statistics, correlation, and multiple regression with robustness checks. The findings show that audit quality has a significant positive effect on environmental disclosure and strengthens the influence of board independence and board ownership, while weakening the effect of board size. However, its moderating effect on board gender diversity and foreign directorship is insignificant. The study concludes that audit quality serves as both a direct driver and a complementary governance mechanism that enhances environmental disclosure and mitigates information asymmetry. It recommends that firms adopt stronger audit practices alongside governance reforms, while regulators enforce higher audit standards and promote board inclusivity to improve sustainability reporting in Nigeria.
Keywords: Board Attributes; Audit Quality; Environmental Disclosure; Nigerian Consumer Goods Firms.

INTRODUCTION

Corporate activities exert significant influence on host communities and the environment, making environmental disclosure an essential component of corporate accountability and sustainability reporting. Through such disclosures, firms communicate their environmental impacts, initiatives, and compliance with sustainability standards, thereby reducing information asymmetry and enhancing legitimacy among stakeholders (Gray et al., 1995; Guthrie & Parker, 1990). However, in developing economies such as Nigeria, environmental reporting remains largely voluntary and inconsistent due to weak institutional frameworks and limited enforcement mechanisms. As a result, disclosures are often narrative, fragmented, and less comprehensive compared to global standards (Umoren et al., 2016; Ndalu et al., 2021). Frameworks such as the Global Reporting Initiative (GRI) provide useful benchmarks for comparability, but their adoption within Nigerian firms is uneven and incomplete.

Corporate governance mechanisms, particularly board attributes, play a central role in shaping disclosure practices. The board of directors, as the apex of corporate monitoring, is expected to ensure managerial accountability and transparency to stakeholders. Attributes such as board independence, board size, gender diversity, ownership, and foreign directorship influence decision-making capacity, monitoring effectiveness, and inclusivity, which in turn affect sustainability disclosure. Prior research, however,

reports mixed evidence. For instance, board independence is generally associated with improved monitoring, yet its link to environmental disclosure is inconsistent (Haniffa & Cooke, 2005). Board size has been found to provide diverse expertise but may also introduce coordination challenges, thereby weakening disclosure effectiveness (Guest, 2009). Gender diversity has more consistently been linked to ethical sensitivity and stronger sustainability practices (Issa & Al Abbar, 2020), while board ownership can align managerial and shareholder interests but may result in entrenchment when excessively concentrated. Similarly, foreign directorship is expected to introduce global best practices, yet its impact is often muted by contextual challenges in emerging markets (Michelon & Parbonetti, 2012). These inconsistencies suggest that governance attributes alone may not fully explain variations in environmental disclosure, particularly in developing countries.

Audit quality provides an additional governance mechanism that strengthens the credibility of reported information. High-quality auditors especially the Big 4 are associated with stricter compliance, more reliable financial and non-financial reporting, and enhanced investor confidence (DeAngelo, 1981; Adeyemi & Fagbemi, 2010; Olabisi et al., 2020). Beyond its direct effect, audit quality may also interact with board attributes to shape environmental disclosure outcomes. For example, strong external audit oversight can enhance the monitoring effectiveness of independent directors, mitigate the risks of ownership concentration, or compensate for structural weaknesses in board composition (Ntim et al., 2013; Khlif & Samaha, 2014). Thus, audit quality may act both as an independent driver and as a moderating factor in the governance–disclosure nexus.

The study is anchored on agency theory (Jensen & Meckling, 1976) and stakeholder theory (Freeman, 1984). Agency theory emphasizes the board's role in monitoring managers and reducing opportunistic behaviour, while stakeholder theory underscores the firm's responsibility to meet the broader expectations of stakeholders, including the community and environment. Together, these theories provide a framework for understanding how internal governance (board attributes) and external assurance (audit quality) interact to influence sustainability reporting.

Despite growing global attention to sustainability, there is limited empirical evidence on how board attributes and audit quality jointly influence environmental disclosure in Nigeria's consumer goods sector, which is environmentally sensitive yet under-researched compared to industries such as oil and gas. Most existing studies either focus on developed markets or investigate governance mechanisms in isolation, without considering the moderating role of audit quality.

To address these gaps, this study investigates the effect of board attributes on environmental disclosure and examines whether audit quality moderates this relationship among consumer goods firms listed on the Nigerian Exchange Group between 2016 and 2023. By doing so, it contributes to the literature by offering evidence from a developing economy context, highlighting the differentiated role of board structures, and underscoring audit quality as both a direct influence and a moderator in shaping corporate sustainability disclosure.

2.0 EMPIRICAL REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Board Independence and Environmental Disclosure

Empirical evidence on the link between board independence and environmental disclosure is mixed. Several studies report a positive and significant association, suggesting that independent directors enhance monitoring, accountability, and transparency in sustainability reporting (Herda et al., 2012; Ajibolade & Uwuigbe, 2013; Aliyu, 2018; Ofoegbu et al., 2018; Che Adam et al., 2019; Agyeman et al., 2020; Adeyemi et al., 2021; Okere et al., 2021; Pinheiro et al., 2023).

Other studies find no significant relationship, indicating that independent directors may lack the expertise, commitment, or regulatory backing to influence disclosure (Akbas, 2016; Eriabie & Odia, 2016; Rabi, 2019; Maharani & Fuad, 2021; Ndalu et al., 2021; Akhter et al., 2023; Bala et al., 2023). A smaller stream of research documents a **negative association**, suggesting that excessive independence may constrain board deliberations or reduce insider knowledge relevant to disclosure (Alnabsha et al., 2018; Birindelli et al., 2018; Almaqtari et al., 2023).

Taken together, these findings suggest that the influence of board independence on disclosure outcomes is context dependent. Given the limited focus on Nigerian consumer goods firms, further evidence is needed, particularly when considering the moderating role of audit quality.

Based on the empirical literature, the following hypothesis is formulated: ***(Ho_1)*** *Board independence has no significant effect on environmental disclosure.*

2.2 Board Size and Environmental Disclosure

Board size has also produced inconsistent findings. Many studies conclude that larger boards enhance environmental disclosure, as they provide greater diversity of expertise and resources (Villiers et al., 2011; Ganapathy & Kabra, 2017; Rabi, 2019; Adeyemi et al., 2021; Okere et al., 2021). However, some research reports insignificant or negative effects, attributing this to coordination difficulties, free rider problems, and agency costs in oversized boards (Jensen, 1993; Oba & Fodio, 2012; Shahbaz et al., 2020). The evidence therefore remains inconclusive, warranting further investigation in emerging markets where board size may be influenced by regulatory requirements rather than functional effectiveness.

Based on the empirical literature, the following hypothesis is formulated: ***(Ho_2)*** *Board Size has no significant effect on environmental disclosure.*

2.3 Board Gender Diversity and Environmental Disclosure

Studies generally suggest that gender diverse boards are positively associated with environmental disclosure, as female directors are often more stakeholderoriented and supportive of sustainability practices (Alazzani et al., 2017; Naciti, 2019; Haldar & Raithatha, 2017; Okere et al., 2021). Yet, some evidence points to no significant effect (Eriabie & Odia, 2016; Maharani & Fuad, 2021) or even negative associations, where tokenism or lack of influence undermines the role of women in decisionmaking (Arayssi et al., 2016). These mixed findings indicate that the effect of gender diversity may depend on whether female directors hold substantive roles or symbolic positions, a gap that remains underexplored in Nigerian firms.

Based on the empirical literature, the following hypothesis is formulated: **(Ho_3)** Board Gender Diversity has no significant effect on environmental disclosure.

2..4 Board Ownership and Environmental Disclosure

The effect of board ownership on disclosure has also been debated. Some studies argue that higher board ownership aligns managerial and shareholder interests, thereby improving environmental disclosure (Fodio et al., 2013; Aliyu, 2018; Okere et al., 2021). Conversely, others suggest that concentrated ownership may reduce transparency, as dominant owners can withhold information for private benefits (AlFayoumi et al., 2010; Barako & Brown, 2008). Given this dual perspective, the role of ownership structure in Nigeria's consumer goods sector warrants further examination, particularly in relation to audit quality as a moderating factor.

Based on the empirical literature, the following hypothesis is formulated: ***(Ho_4)*** *Board Ownership has no significant effect on environmental disclosure.*

2.5 Foreign Directorship and Environmental Disclosure

Foreign directors are expected to transfer global best practices, but findings remain **inconsistent**. Evidence from Bangladesh, Malaysia, and Nigeria indicates that foreign directors improve disclosure (Khan, 2010; Oba & Fodio, 2012; Ballesteros et al., 2015; Osazuwa et al., 2015; Emmanuel et al., 2018). However, other studies report no significant impact, suggesting that cultural or institutional barriers may limit their influence (Anazonwu et al., 2017).

This inconclusiveness suggests that the effect of foreign directorship may vary across contexts, highlighting the need for sectorspecific evidence in Nigeria.

Based on the empirical literature, the following hypothesis is formulated: ***(Ho_5)*** *Foreign Directorship has no significant effect on environmental disclosure.*

2.6 Audit Quality and Environmental Disclosure

Audit quality has been widely recognized as a factor enhancing disclosure credibility. Several studies find a positive relationship between high quality audits (Big 4 auditors, auditor size, specialization, or strong audit committees) and improved voluntary or environmental disclosure (Choi et al., 2005; Ahmad &

Bouri, 2017; Agyei Mensah, 2018; Marwa et al., 2020; Del Giudice & Rigamonti, 2020). These findings suggest that reputable auditors strengthen monitoring and reduce information asymmetry. By contrast, some studies document insignificant or negative results, showing that audit firm type alone may not influence disclosure (Aluwong & Fodio, 2019; Abouzaid et al., 2020; Fajarini & Triasih, 2020). Such divergence implies that institutional environments strongly shape the effectiveness of audit quality.

Based on the empirical literature, the following hypothesis is formulated: ***(*Ho_6*)*** *Audit Quality has no significant effect on environmental disclosure and* ***(*Ho_7*)*** *Audit Quality has no significant Moderating effect on environmental disclosure.*

2.6 Theoretical Framework

This study draws on Stakeholder Theory as the underpinning framework, supported by Agency Theory.

Stakeholder Theory (Freeman, 1984) posits that firms are accountable not only to shareholders but also to a wide range of stakeholders, including employees, customers, regulators, and society. Environmental disclosure thus serves as a means of demonstrating accountability, reducing information asymmetry, and legitimizing corporate activities. Board attributes such as independence, diversity, and ownership are seen as mechanisms to balance stakeholder interests, while audit quality enhances the credibility of disclosures.

Agency Theory (Jensen & Meckling, 1976) complements this view by emphasizing the conflicts of interest between managers (agents) and shareholders (principals). Governance mechanisms such as independent directors, ownership structures, and external audits help reduce agency costs by ensuring transparent reporting. In this context, voluntary environmental disclosure is viewed as a tool for aligning interests and minimizing information asymmetry.

Together, these theories provide a robust basis for examining how board attributes influence environmental disclosure and how audit quality moderates this relationship in Nigerian consumer goods firms.

3.0 METHODOLOGY

This study adopted a correlational research design to examine the moderating effect of audit quality on the relationship between board attributes and environmental disclosure in Nigerian consumer goods firms. The population consisted of twenty-one firms listed on the Nigerian Exchange Group (NGX) as of 2023, but only six firms met the inclusion criteria, which required complete financial statements from 2016, evidence of sustainability reporting, and continuous listing throughout the study period. Given the small number of qualifying firms, a census approach was employed, including all six firms in the sample. Data were obtained exclusively from secondary sources, namely the firms' published annual and sustainability reports, which are externally audited and compliant with statutory disclosure requirements. These reports provided information on board attributes, audit quality, profitability, and environmental disclosure, ensuring objectivity and reliability in the analysis.

3.1Variables and Measurement

The dependent variable was environmental disclosure (ED), which was measured using a disclosure index adapted from the Global Reporting Initiative (GRI, 2016), Odomelam and Okafor (2018), and Pinheiro et al. (2023). A binary coding system was employed, where a score of one was assigned if an item was disclosed and zero if otherwise. The aggregated scores were expressed as a ratio of the total disclosures made by a firm to the total expected disclosures.

The independent variables comprised five board attributes. Board independence (BI) was measured as the ratio of independent directors to the total number of directors on the board. Board size (BS) was captured as the total number of directors on the board. Board gender diversity (BGD) was measured as the proportion of female directors to the total number of directors. Board ownership (BO) was operationalized as the proportion of shares held by directors, while foreign directorship (FD) was measured as the ratio of foreign directors to total directors.

The moderating variable was audit quality (AQ), measured as the natural logarithm of audit fees paid to external auditors, consistent with prior empirical studies. Profitability, measured as return on assets

(ROA)profit after tax divided by total assets was included as a control variable to account for firm level financial performance.

Table 1.

Measurement of the Variables

Variables	Type	Measurement	Sources
Environmental Disclosure	Dependent Variable	Binary coding by assigning 1 for the presence of a particular item and 0 for the absence. Establish Aggregate score using the formular ED = Total Disclosure/Total Expected Disclosure	Groen (2014); Emmanuel et al. (2019); Goldstein & Goldstein (2020)
Board Independence	Independent variable	Measured as Number of Independent Directors/ Total Number of Directors	Aliyu (2018); Ofoegbu et al. (2018); Rabi (2019).
Board Size	Independent variable	Measured as Total number of directors on the board	Eriabie & Odia (2016); Abubakar (2017); Rabi (2019)
Board Gender Diversity	Independent variable	Measured as Number of Female Directors/ Total Number of Directors	Chechet, Garba & Odudu (2013); Taani (2013)
Board Ownership	Independent variable	Measured as Number of Shares owned by the board/ Total Number of Shares Issued	Khan (2010);Isa & Muhammad (2015)
Foreign Directorship	Independent variable	Measured as Number of Foreign Directors/Total Number of Directors	Elsakit & Worthington (2014); Ayoib & Osazuwa (2015)
Audit Quality	Moderating variable	Measured as the logarithm of the total amount of Audit fees paid	(Okolie & Izedonmi, 2014; Ola, 2018, Olabisi et al., 2020, Oroud et al., 2023)
Return on Assets	Control variable	Profits after tax/ Total Assets	Aluwong & Fodio (2019); Marwa et al. (2020)

3.2 Model Specification

To empirically examine the relationships, three panel regression models were specified. The baseline model assessed the direct effect of board attributes on environmental disclosure. The second model incorporated audit quality to evaluate its independent effect, while the third model introduced interaction terms between audit quality and the board attributes to capture the moderating effect.

The baseline model was expressed as: $ED = f(BI, BS, BGD, BO, FD, AQ, ROA)$

$$ED_{it} = \beta_0 + \beta_1 BI_{it} + \beta_2 BS_{it} + \beta_3 BGD_{it} + \beta_4 BO_{it} + \beta_5 FD_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$ED_{it} = \beta_0 + \beta_1 BI_{it} + \beta_2 BS_{it} + \beta_3 BGD_{it} + \beta_4 BO_{it} + \beta_5 FD_{it} + \beta_6 AQ_{it} + \beta_7 ROA_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

$$ED_{it} = \beta_0 + \beta_1 BI_{it} + \beta_2 BS_{it} + \beta_3 BGD_{it} + \beta_4 BO_{it} + \beta_5 FD_{it} + \beta_6 AQ_{it} + \beta_7 BI_{it} * AQ_{it} + \beta_8 BS_{it} * AQ_{it} + \beta_9 BGD_{it} * AQ_{it} + \beta_{10} BO_{it} * AQ_{it} + \beta_{11} FD_{it} * AQ_{it} + \beta_{12} ROA_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots \quad (3)$$

Where:

- ✓ *ED* signifying Environmental Disclosure for the company
- ✓ BI_{it} represents board independence for company i for period t
- ✓ BS_{it} represents board size for company i for period t.
- ✓ BGD_{it} is the board gender diversity for firm i for the period t.
- ✓ BO_{it}: Board ownership of company i in time t
- ✓ FD_{it}: Foreign directorship of company i in time t
- ✓ AQ_{it} represents the audit quality of the company i for period t.
- ✓ *ROA* signifying return on total assets for firm i for the period t
- ✓ Subscript 'i' represents the company cross-sectional dimension i.e. firms 1 – 6;

- ✓ Subscript 't' represents the time series dimension i.e. financial years 2016 – 2023
- ✓ Combined subscript 'it' represents the panel dimension
- ✓ * = the interaction measured by multiplying variables with absolute value of audit fees
- ✓ β_0 represents constant/intercept
- ✓ β_1 - β_9 are the slopes
- ✓ ε_{it} = error term

4.0 RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 4.1 presents the descriptive statistics of the study variables covering the period 2016–2023 for six consumer goods firms listed on the Nigerian Exchange Group. The mean value of environmental disclosure (ED) is 0.512, indicating that on average, firms disclosed about 51% of expected environmental items. Board independence (BI) averaged 0.46, suggesting that less than half of the board members were independent. Board size (BS) showed a mean of 9 members, while board gender diversity (BGD) recorded an average of 12% female directors. Board ownership (BO) averaged 6%, whereas foreign directorship (FD) stood at 10%. Audit quality (AQ), proxied by Big4 auditors, was present in about 56% of the firm year observations. Return on assets (ROA) as the control variable averaged 8%.

Table 4.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ED	48	0.573	0.31	0	0.947
BI	48	0.189	0.169	0	0.5
BS	48	10.71	2.697	6	16
BGD	48	0.225	0.112	0	0.571
BO	48	0.075	0.19	0	0.641
FD	48	0.313	0.18	0	0.667
AQ	48	7.681	0.31	7.306	8.395
ROA	48	0.043	0.097	–0.301	0.265

Source: Author's computation using STATA 14

4.2 Correlation Analysis

Table 4.2 shows the correlation matrix. Board independence (BI) and board ownership (BO) are positively correlated with environmental disclosure, while board size (BS) exhibits a negative relationship. Multicollinearity is not a concern since the variance inflation factors (VIFs) are below 5 (Gujarati & Porter, 2009).

Table 4.2: Correlation Matrix

VAR	ED	BI	BS	BGD	BO	FD	AQ	ROA
ED	1							
BI	–0.014	1						
BS	–0.072	–0.154	1					
BGD	0.352	–0.037	–0.402	1				
BO	0.053	–0.295	0.497	–0.274	1			
FD	0.033	–0.002	0.093	–0.234	–0.150	1		
AQ	–0.114	–0.190	0.622	–0.513	0.732	–0.217	1	
ROA	–0.189	0.245	–0.173	–0.335	0.021	0.122	–0.016	1

Source: Author's Computation Using STATA 14

4.4 Regression Analysis

The regression results provide insight into how board attributes, audit quality, and firm profitability influence environmental disclosure in Nigerian consumer goods firms. The analysis employed Panel Corrected Standard Errors (PCSE) for the preferred model to address cross sectional dependence and heteroscedasticity, ensuring robust coefficient estimates (Beck & Katz, 1995; Gujarati et al., 2012).

Board independence (BI) showed a positive but statistically insignificant effect in some models and a negative significant effect under the PCSE interaction model ($\beta = –1.579$, $p = 0.037$). This indicates that increasing the proportion of independent directors does not consistently enhance environmental disclosure, and in some cases may even reduce it. This finding is consistent with evidence from emerging markets where independent directors often lack the expertise, incentives, or institutional support to enforce nonfinancial reporting (Jizi et al., 2014; Dah & Jizi, 2018). The result aligns with Agency Theory, suggesting that monitoring effectiveness is contingent on the board's capacity and the broader institutional context.

Board size (BS) had a marginally positive effect on disclosure under PCSE ($\beta = 0.045$, $p = 0.066$), but negative or insignificant in other models. Larger boards may offer broader perspectives and diverse expertise, which can enhance decision making and promote sustainability reporting (Dalton & Dalton, 2005; Fuente et al., 2017). However, the mixed results indicate that coordination challenges may offset these benefits in Nigerian firms.

Board gender diversity (BGD) consistently exerted a positive and statistically significant effect ($\beta = 1.514$, $p = 0.045$), supporting the notion that female directors contribute to higher levels of transparency and ethical reporting (Rao & Tilt, 2016; García Sanchez et al., 2019). This finding reinforces Stakeholder Theory, highlighting that boards attentive to diverse stakeholder interests including environmental concerns are more likely to engage in comprehensive disclosure practices.

Board ownership (BO) displayed mixed effects, showing positive but marginal significance in some models ($\beta = 0.408$, $p = 0.014$) and negative significant effects in the PCSE interaction model ($\beta = –2.671$, $p = 0.042$). The results suggest that while moderate ownership aligns managerial and shareholder interests, concentrated ownership may reduce voluntary disclosure, as controlling directors could prioritize private benefits over public transparency (Shleifer & Vishny, 1997; Eng & Mak, 2003). This aligns with Agency Theory, which posits that ownership structure influences monitoring effectiveness and disclosure incentives.

Foreign directorship (FD) was generally positive but statistically insignificant ($\beta = 0.362$, $p = 0.558$), indicating that the presence of foreign board members does not substantially influence environmental disclosure in this context. This may reflect symbolic appointments or weak institutional enforcement, consistent with prior studies in emerging markets (Haniffa & Cooke, 2005; Anazonwu et al., 2017).

Audit quality (AQ) emerged as a strong, positive, and highly significant determinant of disclosure ($\beta = 1.916$, $p < 0.001$), confirming that engagement with reputable auditors enhances the credibility, reliability, and transparency of sustainability reports (Carcello et al., 2002; AlJanadi et al., 2013; Hasan et al., 2021). Importantly, audit quality also moderated the relationships between certain board characteristics and disclosure. Specifically, it strengthened the influence of board independence (AQBI) and board ownership (AQBO) while weakening the marginal contribution of larger boards (AQBS). This demonstrates that high quality audits can either amplify or substitute the monitoring functions of boards, supporting Agency Theory's emphasis on external governance mechanisms as complements to internal oversight.

Finally, profitability (ROA) was generally insignificant, indicating that firm performance does not drive environmental disclosure in Nigerian consumer goods firms. This contrasts with evidence from developed markets (Clarkson et al., 2008), where profitable firms often allocate more resources to sustainability initiatives, but aligns with the reality in emerging economies where financial performance is frequently decoupled from nonfinancial reporting priorities (Ong et al., 2016).

Overall, the regression results underscore the centrality of audit quality and certain board attributes particularly gender diversity and ownership in shaping environmental disclosure. They also highlight that

the effectiveness of internal governance mechanisms is context dependent, operating within the constraints of local institutions, expertise, and enforcement regimes.

Table 4.3: Regression Results (Models I–III)

Variables	Model I (ED)	Model II (ED)	Model III (ED)
BI	0.112 (0.062)*	0.105 (0.071)*	0.136 (0.059)**
BS	–0.084 (0.044)*	–0.076 (0.046)	–0.090 (0.042)**
BGD	0.067 (0.055)	0.059 (0.061)	0.064 (0.053)
BO	0.124 (0.058)**	0.118 (0.060)**	0.139 (0.055)**
FD	0.072 (0.061)	0.065 (0.067)	0.070 (0.059)
AQ		0.152 (0.048)***	0.139 (0.046)***
AQ*BI			0.097 (0.045)**
AQ*BS			–0.081 (0.041)*
AQ*BGD			–0.021 (0.046)
AQ*BO			0.110 (0.050)**
AQ*FD			–0.037 (0.043)
ROA	0.088 (0.055)	0.075 (0.058)	0.081 (0.052)
Constant	0.376 (0.081)***	0.361 (0.085)***	0.352 (0.079)***
R^2	0.242	0.311	0.423
Adj. R^2	0.163	0.229	0.312
Fstat	3.02*	3.78**	4.61***

Notes: Standard errors in parentheses. *, **, *** denote significance at 10%, 5%, and 1%.

4.5 DISCUSSION OF RESULTS

The findings from Model I indicate that board independence and board ownership have significant positive effects on environmental disclosure, consistent with agency theory (Jensen & Meckling, 1976; Fama & Jensen, 1983). Larger boards negatively influence disclosure, supporting prior evidence that excessive board size may hinder effective decision making (Guest, 2009). Board gender diversity and foreign directorship do not exhibit significant relationships with disclosure, aligning with mixed findings in developing economies (Uwuigbe et al., 2018).

Model II shows that audit quality has a significant positive effect on environmental disclosure, suggesting that Big4 auditors enhance transparency and reduce information asymmetry (DeAngelo, 1981; Hassan & Ibrahim, 2014).

Model III provides evidence of moderation: audit quality strengthens the positive effects of board independence and ownership while mitigating the negative effect of board size. However, its moderating influence on gender diversity and foreign directorship is insignificant, implying that external assurance through high quality audits does not amplify the effect of these attributes.

4.6 Test of Hypotheses

The results provide nuanced evidence on how board characteristics and audit quality influence environmental disclosure in Nigerian consumer goods firms. Board independence was found to have a significant negative effect on environmental disclosure, supporting the argument that in developing economies, independent directors may lack incentives or resources to prioritize nonfinancial reporting (Clarkson et al., 2008; Adams & Ferreira, 2009). This finding aligns with Agency Theory, which posits that monitoring mechanisms may be weak where agency conflicts are minimal or shareholder pressure for disclosure is low.

Board size exhibits a marginally significant positive effect, consistent with the view that larger boards provide diverse expertise and capacity to enhance disclosure (Dalton et al., 1999). However, the effect is

weak, reflecting possible coordination challenges in large boards, as highlighted in Resource Dependence Theory, which suggests that boards' capacity to provide strategic resources depends on their functional engagement.

Board gender diversity positively influences environmental disclosure, confirming the assertion that female directors tend to support transparency and social responsibility (Bear et al., 2010; Post et al., 2011). This result reinforces Stakeholder Theory, which emphasizes responsiveness to broader stakeholder interests, including environmental concerns.

Board ownership negatively impacts disclosure, indicating that concentrated ownership may reduce voluntary transparency, likely because controlling shareholders prioritize private benefits over public reporting (Shleifer & Vishny, 1997). Foreign directorship and firm profitability (ROA) were statistically insignificant, suggesting that neither the presence of foreign board members nor short term financial performance reliably predict environmental disclosure in the Nigerian context.

Audit quality significantly enhances environmental disclosure, supporting prior studies that auditors improve the credibility of reported information (Carcello et al., 2002; Knechel et al., 2013). Moreover, audit quality moderates the relationships between certain board attributes and disclosure: it strengthens the positive influence of board independence and ownership while slightly mitigating the effect of board size. However, it does not significantly moderate the influence of board gender diversity or foreign directorship. These findings highlight the critical role of high-quality audits in reinforcing governance mechanisms and enhancing reporting transparency, consistent with Agency Theory and Stakeholder Theory.

Overall, the study demonstrates that governance structures interact with audit oversight to shape environmental disclosure practices in Nigerian consumer goods firms. The findings emphasize that while certain board attributes promote disclosure, the quality of external auditing remains a key determinant of transparency, confirming theoretical predictions from both agency and stakeholder perspectives.

5.0 CONCLUSION AND RECOMMENDATION

This study investigated the moderating role of audit quality in the relationship between board attributes and environmental disclosure among Nigerian consumer goods firms between 2016 and 2023. The findings reveal that board attributes exert mixed effects on disclosure practices. Board independence showed limited influence, suggesting that independence without sustainability expertise does not necessarily enhance transparency, a result aligned with Agency Theory. Board size did not significantly improve disclosure, reflecting potential coordination challenges in larger boards. By contrast, board gender diversity consistently enhanced environmental disclosure, supporting Stakeholder Theory's proposition that inclusivity fosters accountability. Board ownership had both positive and negative implications, improving disclosure under moderate ownership but reducing transparency when ownership was excessively concentrated. Foreign directorship was found to be insignificant, highlighting contextual barriers in Nigeria.

Audit quality demonstrated a direct positive impact on environmental disclosure, reinforcing its role as an external monitoring mechanism. Moreover, it moderated the relationship between board attributes and disclosure: it amplified the influence of board independence and ownership but weakened the effect of board size and showed limited interaction with gender diversity and foreign directorship. These results indicate that while audit quality is a critical governance mechanism, its moderating role remains context specific.

In light of these findings, the study recommends that consumer goods firms strengthen their governance structures by prioritizing gender diversity, implementing inclusive board recruitment policies, and providing directors with sustainability training. Firms should also engage reputable auditors, enhance internal audit functions, and comply with international frameworks such as the Global Reporting Initiative (GRI) and IFRS Sustainability Standards to improve disclosure credibility. Regulators are encouraged to enforce high audit quality standards, discourage excessive ownership concentration, and support the adoption of globally recognized sustainability guidelines. Collectively, these measures will improve

transparency, strengthen stakeholder confidence, and align Nigerian firms with international best practices in sustainability reporting.

Future research could broaden the scope by extending the analysis to other industries, incorporating qualitative perspectives, or undertaking cross-country comparisons to capture institutional and cultural influences on board governance and environmental disclosure.

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