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Impact of Board Attributes on Environmental Reporting of Listed Consumer Goods Firms in Nigeria

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Abstract

This study examined how board attributes affect the environmental reporting of consumer goods companies listed in Nigerian Exchange Group. The study uses ex-post facto research design; the study's population consists of all 21 consumer goods companies that were listed as of December 31, 2024. The study used purposive sampling technique to arrive at a sample of 13 companies. The study's data were obtained from the annual reports and accounts of the sample companies, as well as their independent sustainability and environmental reports. The study data were analyzed using multiple regression. The study findings reveal that the environmental reporting of sampled companies is positively and significantly impacted by board independence, gender diversity, and nationality. While board meetings attendance and broad expertise have negative insignificant impact on environmental reporting. The study concludes that board characteristics have significant impact on the environmental reporting of listed Nigerian consumer goods companies. The study suggests that listed Nigerian consumer goods companies should increase number of non-executive directors, gender diversity and directors with foreign origin or international expertise on their boards in order improve board independence, cross-cultural and international presence. Corporate governance laws should be updated by regulators and policymakers to consider the changing objectives of ESG.

Keywords: ESG, environmental reporting, board attributes, governance, sustainability

1.0 Introduction

Consumer goods companies are established with the aim of maximizing shareholders wealth and as a result, they engaged in different production activities which result in to environmental and social externalities.

The extent through which companies address their environmental externalities is usually communicated through environmental reporting and these are usually influenced by many factors. Notable among these factors are the attributes of firm's board of directors being the body responsible for companies financial and non-financial reporting. In recent years, the intersection between corporate governance and sustainability has generated increasing scholarly and regulatory attention, particularly within the domain of environmental reporting. As environmental degradation, climate change, and resource scarcity have become more pressing issues globally concerns, stakeholders including investors, regulators, and communities are placing higher demands on companies to transparently disclose their environmental performance and impacts (Saha, 2023). The explosion of population, urbanization, affluence, new technologies, industrialization and diversification of the economy are leading to serious concerns for the care of the environment (Osemene et al., 2024). Despite the heightened interest and pressure from stakeholders; corporate environmental reporting is still at its lowest ebb in Nigeria when compared with counterpart countries (Mbonu & Okoye, 2023). In emerging markets like Nigeria, environmental reporting is evolving from a voluntary disclosure tool to a mechanism for accountability, risk

management, and reputation building (Omodero, 2021). The effects of industrialization, oil extraction, gas flaring, farming, mining, manufacturing and agro-allied services on the environment are giving serious concern to all the players in the business sector. Increased climate change, greenhouse gas (GHG) emissions, pollution, non-biodegradation, global warming, etc. have led to a lot of environmental and social issues (Osemene et al., 2024). Therefore, consumer goods firms, due to their heavy reliance on natural resources and extensive supply chains, are especially susceptible to scrutiny regarding their environmental footprints.

Among the corporate governance mechanisms influencing environmental disclosure practices, board attributes play a critical role. To understand the role of board, it should be recognized that boards consist of a team of individuals, who combine their competencies and capabilities that collectively represent the pool of social capital for their firm that is contributed towards executing the governance function (Mbonu & Okoye, 2023). Attributes such as board independence, gender diversity, board size, and frequency of meetings are increasingly recognized as drivers of enhanced sustainability governance (Al-Mamun et al., 2022). These characteristics are believed to be of significant impact on the board oversight, ethical decision-making, and responsiveness to

stakeholders concerns factors that directly shape a firm's environmental reporting behavior. Board diversity, for instance, is often associated with broader perspectives and higher sensitivity to environmental and social issues, while independent directors are presumed to offer objective oversight on environmental compliance (Abubakar & Abubakar, 2020). Thus, the composition and functioning of the board could significantly influence how companies engage with and communicate their environmental performance through environmental reporting.

Environmental reporting has become increasingly significant for corporate accountability, especially in sectors like consumer goods manufacturing that have substantial environmental impacts. In Nigeria, the quality and consistency of environmental disclosures among listed consumer goods firms remain varied, raising concerns about transparency and sustainability commitments. Recent studies have explored the influence of board attributes on environmental reporting practices. For instance, Chukwu & Nkak, (2021) found that board size and diversity positively affect the quality of environmental disclosures among Nigerian consumer goods firms, while board independence showed an insignificant effect. Similarly, Ezeigbo et al., (2023) reported that CEO and board nationality diversity significantly enhance environmental sustainability reporting, whereas

gender diversity had a positive but insignificant impact. Odum, (2023) also highlighted that board diversity influences the likelihood of environmental sustainability disclosures in Nigerian consumer goods firms. However, there remains a paucity of comprehensive research focusing specifically on the consumer goods sector in Nigeria, particularly studies that integrate multiple board attributes and assess their collective impact on environmental reporting. These gaps underscores the need for further investigation into how board composition influences environmental disclosure practices within consumer goods companies in Nigeria.

Despite the growing body of literature on board attributes and environmental reporting, existing empirical studies reveal mixed results and are often context-specific. Most recent works have concentrated on developed economies (Bhattacharya & Sharma, 2022; Alim et al., 2025; Hewagama & Perera, 2020; El-Deeb et al., 2023), with relatively limited attention to African and Nigerian contexts, where institutional settings, regulatory enforcement, and cultural influences differ substantially. Moreover, few studies focus specifically on the Nigerian context, these studies includes ((Bala et al., 2023; Mbonu & Okoye, 2023; Mohammed et al., 2024; Okere et al., 2021). It is important to note that, most of the studies conducted in Nigeria focuses on energy, mining and oil and gas sectors with some focusing on

manufacturing sector generally which can hinder the assessment of sector specific influence and only few among these studies like Chukwu & Nkak, (2021) focus on the consumer goods sector despite its ecological significance and visibility to consumers. This brings the urgent need for further studies in the context of listed Nigerian consumer goods companies. Additionally, while prior research often aggregates Environmental, Social, and Governance (ESG) reporting as a whole, this study isolates environmental reporting, which is arguably the most measurable and pressing of the three dimensions. Furthermore, the study carefully selects the attributes that have environmental perceptions to measure board attributes and environmental reporting is viewed from the qualitative and quantitative point of view with each having distinct weight. To fill the existing gaps in the literature, there is a clear need to contextualize the relationship between board characteristics and environmental disclosure in Nigeria's consumer goods industry.

The main objective of the study is to examine the effect of board attributes on environmental reporting of listed consumer goods firms in Nigeria.

2.0 Literature Review

This section is design to extensively review existing literature relevant to board attributes and environmental reporting, Includes review of

relevant concept as well as theories and empirical studies.

Concept of Environmental Reporting

Corporate environmental disclosure simply refers to self-reporting of firms' environmental impact information to stakeholders. The communication of this information is done in a variety of different forms and mediums such as the annual reports, stand-alone environmental reports, pamphlets, documentaries, brochures (Mbonu & Okoye, 2023). On the other hand, environmental accounting disclosure, which prioritizes the disclosure of environmental issues while preparing environmental financial reports, has grown in popularity recently around the globe as organizations are now striving to maximize their value to achieve long-term sustainability (Bala et al., (2023). A sustainable business environment is one that ensures a strong, healthy and just society. This, therefore, means meeting the different needs of all people in the existing and future communities, promoting individual well-being, social cohesion, inclusion and creating equal opportunity (Osemene et al., 2024). Environmental reporting refers to the disclosure of a firm's environmental performance, policies, and impacts, often through sustainability or integrated reports. It enhances transparency, accountability, and legitimacy among stakeholders (Global Reporting Initiative, 2020).

Environmental reporting has emerged as a critical component of corporate accountability in the modern business environment. It reflects the extent to which organizations disclose information on their environmental policies, performance, and impacts. In the context of sustainability, environmental disclosure provides stakeholders with insights into how companies manage ecological risks and contribute to sustainable development (Aliyu, 2019). The practice is largely guided by frameworks such as GRI and is either voluntary or regulatory depending on jurisdiction. Theories such as stakeholder and legitimacy theory commonly underpin its relevance (Hewagama & Perera, A. 2020; King'ori et al., 2019).

From a measurement perspective, scholars have adopted content analysis of annual reports, corporate websites, and sustainability reports, using established disclosure checklists such as the Global Reporting Initiative (GRI) guidelines. Under this method, disclosure quality is assessed by comparing the total number of disclosed items with the total number of required items in the checklist. Thus, ER is commonly operationalized as the ratio of disclosed items to the total required items, ensuring comparability across firms (Aliyu, 2019; Alam & Nuhu, 2024).

Concept Board Independence

Board independence refers to the presence of non-executive or outside directors who are free from managerial influence and can provide objective oversight. Independent directors are widely regarded as central to effective corporate governance because they mitigate agency conflicts and protect the interests of shareholders and other stakeholders (Okere et al., 2021). Their independence is expected to compel managers to engage in responsible practices, including transparent environmental reporting. Empirical evidence suggests mixed outcomes. Okere et al., (2021) found that board independence is positively associated with higher-quality environmental disclosure, while Mohammed et al., (2024) reported insignificant effects, particularly in firms with concentrated ownership. The variable is typically measured as the proportion of independent directors to the total number of directors on the board (Aliyu, 2019).

Concept of Board Expertise

The presence of directors with financial and professional expertise strengthens the board's monitoring role and enhances the credibility of corporate disclosures. Board members with financial expertise are better positioned to understand the implications of environmental costs, risks, and opportunities, thereby encouraging

comprehensive reporting (Aliyu, 2019). The operationalization of board expertise often involves calculating the proportion of directors with professional or financial qualifications relative to total board membership. Prior research emphasizes that expertise not only enhances board deliberations but also signals credibility to external stakeholders.

Concept of Board Gender Diversity

Gender diversity in the board structure introduces varied perspectives and enhances ethical sensitivity, particularly in relation to sustainability issues. Female directors are perceived as more stakeholder-oriented and socially responsible, and their presence has been linked to higher levels of corporate social and environmental disclosure (Pinheiro et al., 2023). Recent evidence from Pinheiro et al., (2023) further demonstrates that firms with more gender-diverse boards exhibit greater transparency in environmental reporting. Measurement is typically based on the proportion of female directors to the total number of board members.

Concept of Board Nationality

Board nationality diversity captures the presence of directors with foreign origins, which introduces international perspectives and exposure to global best practices in sustainability. Foreign directors often demand stricter adherence to international

disclosure standards and may push firms toward higher-quality reporting practices (Okere et al., 2021). Okere et al., (2021) argue that nationality diversity promotes global legitimacy and helps firms align with transnational sustainability expectations. The construct is operationalized as the proportion of foreign directors relative to the total board size.

Concept of Board Meetings

The frequency of board meetings reflects the intensity of board monitoring and oversight functions. Regular meetings create opportunities for directors to deliberate on key issues, including environmental strategies and reporting requirements (Aliyu, 2019). Empirical findings are, however, inconclusive. Mohammed et al., (2024) found that frequent meetings were positively associated with disclosure quality, while other studies suggest that excessively frequent meetings may indicate inefficiency or governance challenges. Board meetings are measured by the total number of meetings held annually.

Empirical Review

Empirically, Alim et al., (2025) examines the effect of board attributes on sustainability practices in developed economies. This study examined four developed countries (China, UK, Germany, Japan) using ESG scores as a proxy for sustainability performance. It found that board size,

independence, and gender diversity all positively and significantly influenced ESG performance. The strength of this paper lies in its large sample (2400 observations) and robust statistical methodology (OLS and fixed effects). It confirms the broader assumption that well-structured boards enhance strategic environmental integration. However, the study did not explore sector-specific dynamics, which may disclose industry specific effects. Lislamiyah et al., (2024) examines the effect of carbon emission disclosure on environmental disclosure in Indonesia's Energy Sector focusing on carbon emissions, this study analyzed 60 energy firms (2019–2021). It showed that company size and environmental performance positively affect disclosure, while company age and the presence of women on boards do not. The authors cite agency and legitimacy theories to frame their results. Notably, the study challenges the presumed automatic impact of gender diversity on environmental action. While statistically sound, the analysis could benefit from exploring how board roles (e.g., executive vs. non-executive women) might mediate these outcomes.

Mohammed et al., (2024), who focused on the moderating role of board commitment in the relationship between board attributes and sustainability reporting in Nigeria. Their findings add a layer of complexity: while board size and independence initially correlated positively with

sustainability disclosure, these relationships turned negative when board commitment (measured by meeting frequency) was introduced as a moderator. This challenges the linear assumptions of earlier studies and underscores that the mere presence of independent directors or a large board may not always translate into better disclosure unless matched by active engagement. however, gender diversity was found to have an insignificant impact, a deviation from Hewagama and Perera's New Zealand findings. While this paper provides fresh insight into internal board dynamics, it perhaps over-relies on meeting frequency as a proxy for commitment, overlooking the qualitative depth of such interactions.

Alam and Nuhu, (2024) investigates the impact of board characteristics on ESG disclosure in the energy industry of emerging economies. The study adopts the Bloomberg ESG rating to measure the extent of ESG disclosure using a sample of 1260 observations from BRICS emerging economies. Multiple regression techniques were used to estimate the effect of board characteristics on ESG disclosures of a sample BRICS listed companies between 2010 and 2019. The study finds a relatively low (at 37 percent) level of ESG disclosure among the sampled firms and a relatively high degree of variability. The authors also find that board gender diversity, board composition and board diligence are positively related to the level of

ESG disclosure while the study document no relationship between board size and ESG disclosure. Practical implication: The study findings highlight the importance of corporate board attributes in influencing strategic decisions like the level of ESG disclosure and the findings may be useful to regulators, policymakers and investors in making informed investment decisions. Originality/value: This study is one of the first attempts at examining the impact of board characteristics on ESG disclosure in the energy industry in emerging economies. The paper provides new evidence on the relationship between BC and ESG disclosure in the energy industry of emerging BRICS countries within a panel multi-country research setting.

Pinheiro et al., (2023) investigates the impact of the board of directors' attributes on companies' environmental disclosure. The sample comprised 1,037 companies from Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States between 2015 and 2018. The results reveal that the percentage of independent auditors, board size, and the presence of the sustainability committee positively influence environmental disclosure. The findings also show that greater diversity on the board is an important factor for companies to disclose more information on their emissions. It therefore, conclude that companies should pay greater attention to the characteristics of their boards of directors, as this determines their

engagement in environmental issues. The study considers only few aspect of board attribute which undermine the degree through which its findings can be relied on.

Okere et al., (2021) analyze the relationship amid board characteristics and environmental information disclosure of listed Nigerian manufacturing firms. The data used were sourced from twenty (20) Nigerian listed companies from the manufacturing sectors, which were randomly chosen from manufacturing firms listed on the Nigerian stock market between 2013 and 2017. The study made use of ordinary least squares regression. According to the research findings, there exists a positive and significant relationship linking board independence and environmental disclosure in Nigeria's oil and gas and manufacturing sectors. In line with the results, a large board of directors comprised of foreign directors would improve firms' environmental disclosure. Furthermore, this study's findings would help organisations satisfy stakeholders' needs in their corporate governance practices. This study throws light on voluntary disclosures and how firms can adjust their corporate governance practices to boost their environmental disclosures, which is a contemporary issue because stakeholders demand more information that affects their investing decisions.

On the other hand, Moruff et al., (2021) explore board characteristics across seven years (2012–

2018) among 50 environmentally sensitive firms in Nigeria. Unlike the New Zealand study, which emphasized board composition and diversity, this paper incorporated board expertise and demographic diversity as additional explanatory variables. Using the GRI index as the disclosure benchmark, their results confirmed that board size, independence, expertise, and gender diversity all positively influenced social and environmental disclosure (SED). What makes this study particularly valuable is its emphasis on a mixed theoretical approach, acknowledging both stakeholder and agency perspectives. However, the wide array of variables, though ambitious, might dilute the specificity of individual effects, and the reliance on annual reports without triangulating data may underrepresent disclosure quality.

Meanwhile, Aliyu, (2019) took a focused look at risk management committees alongside traditional board characteristics in relation to corporate environmental reporting (CER) among Nigerian firms. His study revealed that board independence and meeting frequency significantly enhanced CER, while board size and risk committee composition did not exhibit a significant effect. This introduces a critical consideration: that not all governance structures equally drive environmental accountability. The study's integration of risk oversight into the discourse is commendable, marking a departure from the standard board

attribute variables. Still, its findings regarding board size deviate from most other studies, possibly due to sector-specific governance cultures or variations in regulatory enforcement.

Similarly, King'ori et al., (2019) contributed to the East African perspective through an analysis of firms listed on the Nairobi Securities Exchange. Their study confirmed that board independence and qualifications (particularly financial literacy) had a positive and significant influence on environmental sustainability disclosures. Using Pearson correlation and OLS regression over a five-year span, the authors demonstrated that a high proportion of non-executive directors and well-qualified board members correlates with enhanced disclosure. Interestingly, while board qualifications did matter, their effect was less pronounced than that of board independence. The study's methodological robustness, grounded in the Trinity Theory (a blend of agency, stakeholder, and legitimacy theories), offered a well-rounded conceptual framework. However, a deeper dive into the specific nature of qualifications such as environmental knowledge or CSR experience could have yielded richer insights.

Theoretical Review

From the theoretical perspective, the interaction between board attributes and environmental reporting of listed consumer goods firms in Nigeria

can be explain using the stakeholder's theory. The stakeholders' theory was the ideology of Johnson, (1971) who conceived that a socially responsible firm is one that balances a multiple of interests alongside that of the shareholders, which while striving to achieve larger profits for the owners, also considers the interests of the employees, suppliers, investors, local communities and the society at large (Osemene et al., 2024). Stakeholder theory argues that companies are accountable not only to shareholders but to a broad range of stakeholders, including communities, governments, and environmental groups (Freeman, 1984). Environmental reporting is thus a response to stakeholder pressure and expectations. This theory is explicitly used in studies by Hewagama and Perera, (2020) and Moruff et al., (2021) to justify the inclusion of environmental information in corporate disclosures as a means of maintaining stakeholder support and legitimacy.

3.0 Research Methodology

The study adopted an ex-post factor research design because the study used historical data. For the purpose of this study, data were collected using the secondary method of data collection from the annual reports and accounts as well as the stand-alone sustainability and environmental reports of the sample firms. The population of the study is made up of the entire consumer goods firms listed on the floor of the Nigerian Exchange Group which

stands at 21 as at 31st December, 2024. Purposive sampling techniques was adopted using two-way filters to arrive at the sample size. For firm to be part of the sample, it must be listed on or before 1st January, 2015 and remain listed up to 31st December, 2024. Based on this, the study arrives at a sample size of 13 companies. Data for the study was analyzed using descriptive and inferential methods of data analyses. The study used multiple regression analyses to determine the effect of board attributes on environmental reporting. Various diagnostic and post estimation tests were conducted before running the regression analyses. Environmental reporting as dependent variable was measured using GRI environmental disclosure index. On the other hand, board attributes as independent variable were proxied using board independence, board expertise, board gender diversity, board nationality and board meeting frequency.

Table 1: Variables Definition, Measurement and Sources

Variables	Definition	Measurement	Sources
Dependent variable ENV	Environmental Reporting	Measured as total number of items disclosed using GRI guidelines divided by total items required	(Aliyu, 2019); (Ibrahim et al., 2021)
Independent Variables			
BIND	Board Independence	Measured by the percentage of the independent directors to the total number of directors on the board.	(Chouaibi et al., 2022); (Aliyu, 2019); (Zhu et al., 2024a); (Akbas, 2016)
BEXP	Board expertise	The proportion of board members with financial expertise in the board	(Aliyu, 2019)
BGD	Board gender diversity	The proportion of women directors in the board room	(Akbas, 2016) (Zhu et al., 2024)
BNAT	Board Nationality	The proportion of board members who are from foreign countries	(Zhu et al., 2024); (Ofoegbu et al., 2018)
BM	Board Meetings	Board meetings Number of board meetings held annually	(Aliyu, 2019); (Ofoegbu et al., 2018)

Source: Compiled by Authors, 2025

The study model was adapted from the work of Mbonu & Okoye, (2023). The model use in this study is presented below:

$$ENV = f (BIND, BEXP, BGD, BNAT, BM) \dots \dots \dots (I)$$

Equation I is rewritten in econometric form as:

$$ENV_{it} = \beta_0 + \beta_1 BIND_{it} + \beta_2 BEXP_{it} + \beta_3 BGD_{it} + \beta_4 BNAT_{it} + \beta_5 BM_{it} + \varepsilon \dots \dots \dots (II)$$

Where:
ENV= Environmental Reporting
BIND= Board Independence
BEXP= Board Expertise
BGD= Board Gender Diversity
BNAT = Board Nationality
BM = Board Meeting Frequency
I = the Firms
t = Period covered
ε it= Error term

4. Data Presentation and Analyses

This section presents the result of data analyses, it is made up of the descriptive statistics, correlation analyses, diagnostic and post estimation tests as well as regression analyses. It also includes discussion of findings. Table 1 shows the result of descriptive analyses.

Table 1: Descriptive Statistics

Variable	Obs	Mean	SD	Min	Max
ENV	130	0.465	0.250	0	0.978
BIND	130	0.610	0.170	0.167	0.909
BEXP	130	0.576	0.264	0.111	1
BGD	130	0.184	0.120	0	.5
BNAT	130	0.285	0.202	0	0.714
BM	130	4.969	1.311	3	11

Source: Compiled by Authors, (2025)|

Table 1 presents the descriptive statistics for the key variables, offering insights into the general trends and variability. From the Table, the average environmental reporting score is 0.465, indicating

that firms disclose approximately 46.5% of the environmental information required or expected. This moderate level of disclosure suggests a growing, yet inconsistent, commitment to environmental transparency. The minimum value of 0 reflects that some firms provide no environmental disclosures, while the maximum value of 0.978 shows that a few are nearly comprehensive in their reporting. The standard deviation of 0.25 reflects a moderate spread in environmental reporting levels across firms. The wide range in disclosure levels signals the absence of uniform regulatory enforcement or differing levels of environmental consciousness among firms. It implies that while some companies are embracing environmental reporting, many still lag behind pointing to a potential gap in stakeholder accountability or board engagement.

The mean proportion of independent directors is 0.610, suggesting that, on average, 61% of board members are non-executive or independent. This is generally aligned with corporate governance best practices that promote independence for improved oversight. The values range from 0.167 to 0.909, showing substantial differences in board composition across firms. A relatively high average indicates that most firms understand the value of independent oversight, which may enhance objectivity in monitoring management and encourage transparency, including environmental

disclosure. However, the variation suggests that some firms may still operate with insider dominated boards, potentially weakening checks and balances. On the other hand, firms report an average board expertise level of 0.576, meaning that around 58% of board members possess relevant professional knowledge or industry specific skills. The standard deviation of 0.264 and values ranging from 0.111 to 1 indicate considerable variation in the level of expertise across firms. High board expertise is critical for understanding complex issues like sustainability and environmental risk. The presence of knowledgeable board members can facilitate more informed decisions and encourage robust environmental reporting practices.

Similarly, the average representation of women on the board is 18.4%, with values ranging from 0 to 50%. This reflects a low level of female inclusion in corporate governance. Therefore, gender diversity is widely associated with improved governance quality and a broader perspective on stakeholder issues, including environmental and social concerns. The low average in this dataset indicates that Nigerian consumer goods companies may be underutilizing the benefits of gender diverse leadership. The lack of female presence may also reflect deeper structural or cultural barriers within corporate boardrooms. On the other hand, the average board nationality diversity stands at 28.5%, indicating that nearly one third of board members,

on average, are from foreign or diverse national backgrounds. This variable ranges from 0 to 71.4%, suggesting that while some firms have fully local boards, others embrace significant international representation.

Finally, the average board meetings indicating board commitment to sustainability and environmental reporting is approximately 5 meetings, with the lowest board meetings of 3 and the highest of 11 meetings. This shows that most boards fall within the required minimum meetings of 4 in every financial year as suggested by the Nigerian code of corporate governance. This therefore implies that the higher the number of meetings held by the board, the greater the possibility of discussing environmental related issues there by leading to greater compliance with environmental reporting requirements.

Table 2: Correlations Matrix

Variables	ENV	BIND	BEXP	BGD	BNAT	BM
ENV	1.000					
BIND	0.170 (0.053)	1.000				
BEXP	-0.114 (0.195)	- (0.000)	1.000			
BGD	0.374* (0.000)	-0.101 (0.253)	0.226* (0.010)	1.000		
BNAT	0.193* (0.027)	-0.083 (0.346)	- (0.000)	0.056 (0.531)	1.000	
BM	0.123 (0.165)	0.054 (0.540)	-0.013 (0.882)	0.360* (0.000)	0.295* (0.001)	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Compiled by Authors, (2025)

Table 2 shows that the correlation between environmental reporting (ENV) and board independence (BIND) is positive ($r = 0.170$) and statistically significant at the 10% level ($p = 0.053$). This suggests a weak but noteworthy association, indicating that firms with a higher proportion of independent directors are slightly more likely to engage in environmental reporting. This implies that independent directors, by virtue of their external oversight and detachment from management, are more inclined to uphold transparency and protect stakeholder interests. Although the relationship is not strong, its statistical significance implies that increasing board independence may encourage greater accountability and environmental disclosure. On the contrary, a negative correlation was found between environmental reporting and board expertise ($r = -0.114$), but this result is not statistically significant ($p = 0.195$). This implies that there is no meaningful linear relationship between the proportion of board members with professional or industry relevant expertise and the extent of environmental disclosures made by the firms. Contrary to expectations, having more technically skilled or professionally qualified directors does not necessarily translate to improved environmental reporting. This may suggest that board expertise, while beneficial in other strategic areas, may not directly influence or prioritize sustainability and environmental issues especially

if such expertise is concentrated in traditional finance or operations rather than in environmental governance.

On the other hand, a moderate and statistically significant positive relationship was observed between environmental reporting and board gender diversity ($r = 0.374$, $p = 0.000$). This represents one of the strongest correlations in the matrix and highlights that firms with more women on their boards tend to have higher levels of environmental disclosure. This finding reinforces the growing body of literature that links gender diversity with enhanced corporate social responsibility. Female directors are often found to bring diverse perspectives and are more attuned to ethical, social, and environmental concerns. This suggests that promoting gender diversity on boards could be a strategic lever for boosting a firm's environmental transparency and sustainability commitment. Similarly, there is also a positive and statistically significant correlation between environmental reporting and board nationality diversity ($r = 0.193$, $p = 0.027$). This implies that firms with a more internationally diverse board tend to disclose more environmental information.

Additionally, the correlation between environmental reporting and the frequency of board meetings is positive but weak ($r = 0.123$, and it is not statistically significant ($p = 0.165$). This means there is no clear evidence of a meaningful linear

relationship between how often the board meets and the extent of environmental reporting by the firm. While one might expect that more frequent board meetings would allow greater attention to be paid to strategic and sustainability issues, this result suggests that simply increasing the number of meetings does not automatically lead to better environmental disclosure.

Finally, a strong negative correlation exists between board independence and board expertise ($r = -0.390$, $p = 0.000$), suggesting that more independent boards tend to have fewer technically skilled members. This could indicate a trade-off between independence and technical expertise when appointing board members. Similarly, a significant negative correlation was observed between board expertise and board nationality diversity ($r = -0.308$, $p = 0.000$), implying that as boards become more internationally diverse, the overall concentration of traditional expertise might decline. This may reflect differing qualification standards or priorities in director selection. On the positive side, board gender diversity correlates positively with board meetings ($r = 0.360$, $p = 0.000$), as does board nationality diversity ($r = 0.295$, $p = 0.001$).

Table 4: VIF Test for Multicollinearity

Variables	VIF	1/VIF
BEXP	1.450	0.688
BNAT	1.310	0.764
BM	1.280	0.779
BIND	1.270	0.787
BGD	1.230	0.816
Mean VIF	1.310	

Source: Compiled by Authors, (2025)

Table 4 shows the result of variance inflation (VIF) test for multicollinearity. The VIF is used to detect the presence of multicollinearity among the independent variables in a regression model. All the VIF values are well below the critical threshold of 10, with most falling in the acceptable range between 1 and 2. This means that the independent variables do not have high correlations with each other, which is crucial for ensuring the reliability and stability of the regression coefficients.

Table 5: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Variables	Coefficients
Chi2(1)	0.11
Prob > chi2	0.7416

Source: Compiled by Authors, (2025)

Table 5 shows the result of the Breusch-Pagan / Cook-Weisberg test to check for heteroskedasticity in a regression model. The Table shows a Chi-square (χ^2) statistic of 0.11 with corresponding p-value of 0.7416 which is not significance at 5% and as such signify the absence of heteroskedasticity among the data set.

Table 6: Hausman specification test

	Coef.
Chi-square test value	-65.349
P-value	1

Source: Compiled by Authors, (2025)

Table 6 shows the result of Hausman specification test for fixed effect. The Table shows a Chi-square test statistic of -65.349 and corresponding P-value of 1 which is not significance at 5% and as such random effect model is more appropriate. However, to select between random effect model and pooled OLS the Breusch and Pagan Lagrangian Multiplier (LM) test for Random Effects was conducted and the result displayed in Table 7.

Table 7: Breusch and Pagan Lagrangian multiplier test for random effects

Variables	Coefficients
chibar2(01)	25.42
Prob > chibar2	0.0000

Source: Compiled by Authors, (2025)

The results of the LM test showed a chibar-squared (χ^2) value of 25.42, with an associated p-value of 0.0000. This extremely low p-value is highly statistically significant, far below the conventional thresholds of 0.01, 0.05, or even 0.10. Therefore, in combination with the earlier Hausman test, which indicated that Random Effects is preferable over Fixed Effects, the LM test reinforces the decision to adopt a Random Effects estimation strategy for

analyzing the impact of board attributes on environmental reporting.

Table 8: Regression Result

ENV	Coef	St.Err	t-value	p-value	[95% Conf	Interval]	Sig
BIND	.305	.136	2.24	.027	.036	.575	**
BEXP	-.069	.098	-0.71	.482	-.264	.125	
BGD	.911	.198	4.61	0	.52	1.302	***
BNAT	.241	.12	2.02	.046	.004	.478	**
BM	-.02	.017	-1.18	.238	-.054	.013	
Constant	.322	.123	2.62	.01	.078	.565	***
R-squared			0.232	Number of obs			130
F-test			8.709	Prob > F			0.000

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: *Compiled by Authors, (2025)*

The regression result was shown in Table 8. In examining the relationship between board attributes and the extent of environmental reporting among listed consumer goods firms in Nigeria, a linear regression model was employed. The Table revealed that the model is statistically significant overall, indicating that the selected board characteristics, when considered collectively, have a meaningful impact on environmental reporting practices. The F-statistic for the model stood at 8.709 with a p-value of 0.000, providing strong evidence against the null hypothesis that the explanatory variables have no joint influence on the dependent variable. More so the R-squared value of 0.232 suggests a moderate explanatory power explaining about 23.2% of the variation in environmental disclosure.

Similarly, among the specific board characteristics, board independence emerged as a significant

positive determinant of environmental reporting. The coefficient for board independence was 0.305 and statistically significant at the 5% level ($p = 0.027$). This suggests that companies with a greater proportion of independent directors tend to disclose more environmental information. The positive and significant effect of board independence on environmental reporting suggests that independent directors play a critical role in promoting transparency and accountability. In contrast, board expertise did not show a significant relationship with environmental reporting. With a negative coefficient of -0.069 and a high p-value of 0.482, the result suggests that the presence of technically or professionally qualified directors does not necessarily translate into improved environmental disclosure. This could imply that expertise alone may not be enough to influence environmental reporting unless it is accompanied by a firm commitment to sustainability or relevant policy incentives.

On the other hand, board gender diversity had the strongest positive influence on environmental disclosure, with a highly significant coefficient of 0.911 ($p = 0.000$). This result supports the view that gender diverse boards with more female representation tend to be more socially and environmentally responsible. Women on boards may bring unique perspectives and place higher value on ethical conduct and stakeholder

engagement, leading to better reporting outcomes in these areas. On the same lane, board nationality diversity was also found to be a statistically significant factor, with a coefficient of 0.241 and a p-value of 0.046. This suggests that having directors from varied national backgrounds is associated with more comprehensive environmental reporting. The result could be interpreted to mean that foreign or internationally experienced directors bring with them global best practices and greater sensitivity to environmental standards, positively influencing the firm's disclosure behaviors.

Lastly, the frequency of board meetings did not have a statistically significant impact on environmental reporting. The coefficient for board meetings was -0.020 with a p-value of 0.238. This implies that simply holding more meetings does not necessarily lead to better environmental transparency. It may indicate that the quality of board discussions and agenda-setting around environmental issues is more important than the quantity of meetings held. In summary, this analysis underscores that board independence, gender diversity, and nationality diversity are important drivers of environmental disclosure among Nigerian consumer goods firms. These findings offer important implications for regulators, shareholders, and corporate governance advocates: enhancing board diversity and independence may

serve as a practical strategy to improve transparency and accountability in corporate environmental performance. In contrast, attributes such as board expertise and meeting frequency, at least on their own, do not appear to significantly influence environmental disclosure levels within the scope of this study.

5. Conclusion and Recommendations

This study examined the influence of board characteristics on the extent of environmental reporting among listed consumer goods firms in Nigeria. Based on the regression analysis, it is therefore concluded that board independence, gender diversity, and nationality diversity are significant positive predictors of environmental disclosure. Conversely, board expertise and the frequency of board meetings were found to have no statistically significant impact on environmental reporting of listed consumer goods firms in Nigeria for the period under review.

In line with the findings and conclusions, the study recommends that listed consumer goods firms in Nigeria should strengthen board independence by increasing the proportion of non-executive and independent directors on their boards. This is crucial because Independent directors are more likely to champion transparency and environmental accountability due to their objectivity and external oversight role. Also, listed consumer goods firms in

Nigeria should promote gender diversity in board structure by pursuing gender inclusive board appointments. This is critical because, the significant impact of female board representation on environmental disclosure suggests that women bring a value driven approach that benefits sustainability and environmental practices. Furthermore, listed consumer goods in Nigeria should encourage international and cross-cultural representation by appointing directors with international experience or foreign backgrounds. This is important because, nationality diversity fosters exposure to global environmental standards and promotes the adoption of international best practices. Lastly, Policymakers and regulators should revise corporate governance codes to reflect evolving ESG priorities. This is because; mandating diverse and independent boards may improve national corporate sustainability performance.

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