

# Corporate Governance Mechanism and Environmental Disclosure in Nigeria: Moderating Effect of Audit Firm Choice

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## Abstract

*This study examines the moderating effect of audit firm choice on the relationship between corporate governance mechanisms and environmental disclosure among listed non-service companies in Nigeria. Employing a correlation research design, the study gathered secondary data from annual reports, standalone reports, and reports on compliance with the Nigerian Code of Corporate Governance 2018 from 51 out of 71 non-service companies listed on the Nigerian Exchange Group over a five-year period (2018-2022) through content analysis. Regression analysis using Generalised Least Squares (GLS) was employed to analyse the data. The findings indicate that audit firm choice moderates the relationship between, board meetings, board independence, and environmental disclosure. The study concludes that audit firm choice moderates the relationships among board meetings, board independence and environmental disclosure of listed non service companies in Nigeria. In light of these results, the study recommends that regulatory bodies overseeing governance codes in Nigeria should place greater emphasis on audit firm choice, board independence and board meetings to enhance the effectiveness of board oversight and bolster the credibility of information communicated to stakeholders.*

**Keyword:** Environmental disclosure, Corporate Governance Mechanisms, Audit Firm Choice, Generalised Least Square.

**JEL Classification:** M 5

## 1. Introduction

Environmental disclosure has become increasingly important in corporate reporting, reflecting a company's commitment to environmental sustainability and responsibility. Environmental disclosure refers to the communication of a company's environmental performance and impacts through its financial reporting, sustainability reports, or other channels. It encompasses information on environmental policies, initiatives, performance indicators, and compliance with regulations. Examining environmental disclosure is essential for several reasons. Firstly, it enhances transparency and accountability, allowing stakeholders to assess a company's environmental performance and its alignment with sustainable practices. Secondly, it fosters investor confidence by providing insights into a company's long-term sustainability strategy and risk management practices. Thirdly, it promotes corporate social responsibility by encouraging companies to minimise their environmental footprint and contribute positively to society and the environment.

Practical, theoretical and methodological problems surround environmental accounting disclosure. The practical issues that motivate the examination of environmental disclosure is the increasing environmental concerns and regulatory pressures, companies are under growing scrutiny to disclose their environmental impacts accurately and transparently. Theoretical challenges include the complexity of measuring and evaluating environmental

impacts and the limited understanding of the factors influencing companies' environmental disclosure decisions.

Methodological problems also exist concerning the relationship between corporate governance mechanisms and environmental disclosure. The corporate governance mechanisms in this context are board meetings, board independence and board size. There are mixed findings from the previous research conducted on the relationship between corporate governance mechanisms such as board meetings, board independence and board size and environmental disclosure. Research on the relationship between board size and environmental disclosure presents mixed findings. Some studies show a positive relationship (see for instance Agyemang et al., 2020; Gerged, 2020; Ika et al., 2021; Iredele & Moloi, 2020; Kilincarslan et al., 2020; Okere et al., 2021; Yanto & Maulia, 2020), while others report a negative relationship (see for instance Okafor et al., 2022). Additionally, some studies find insignificant relationships (see for instance Aliyu, 2019; Fernandes et al., 2018; Haladu & Salim, 2017; Pucheta-Martínez & López-Zamora, 2018).

Similarly, research on the relationship between board meetings and environmental disclosure has produced mixed findings. Agyemang et al. (2020) and Aliyu (2019) found a positive and significant relationship, while Odoemelam and Okafor (2018) and Pucheta-Martínez and López-Zamora (2018) found a positive but insignificant relationship. Various studies have also explored the relationship between board independence and environmental disclosures, yielding mixed results. Egbunike et al. (2018), Agyemang et al. (2020), Gerged (2020), Giannarakis et al. (2019), and Aliyu (2019) found a positive relationship, while Kilincarslan et al. (2020), Rabi (2019), and Liu et al. (2019) found a negative relationship. Mahmood et al. (2018) reported an insignificant relationship. Furthermore, existing literature often focuses on developed economies, neglecting the unique institutional and regulatory contexts of Nigerian listed companies.

In the context of listed non-service companies in Nigeria, this disclosure is an important aspect of corporate governance mechanisms. The focus on listed non-service companies in Nigeria is justified for several reasons. Firstly, listed non service companies play a significant role in the Nigerian economy and stock market, making their environmental disclosure practices influential and relevant. Secondly, non-service companies, particularly those in sectors such as agriculture, conglomerate, construction and real estate, consumer goods, industrial goods, natural resources, oil and gas and health care, often have substantial environmental footprints and impacts, making their environmental reporting practices crucial for stakeholders' decision-making. Therefore, examining moderating effect of audit firm choice on the relationship between corporate governance mechanisms and environmental disclosure in listed non-service companies can provide valuable insights into improving sustainability practices and governance standards across listed non service companies of the Nigerian economy.

## **2. Literature Review**

The primary objective of this research is to explore how the choice of audit firm moderates the relationship between corporate governance mechanisms and environmental disclosure among listed non-service companies in Nigeria. To achieve this, the relevant concepts, theories, and empirical reviews were considered in this section.

### **2.1 Environmental disclosure**

Environmental disclosure, as a concept, pertains to the communication of environmental information by organisations to stakeholders. This encompasses various aspects of a company's environmental performance, including environmental policies, practices, impacts,

and initiatives. The purpose of environmental disclosure is manifold, aiming to enhance transparency, accountability, and stakeholder engagement regarding an organisation's environmental practices (Abubakar & Moses, 2020; Issa et al., 2021). By providing information on their environmental performance, companies not only meet regulatory requirements but also address the increasing demand for sustainability reporting from investors, consumers, and other stakeholders. Moreover, environmental disclosure serves as a tool for companies to showcase their commitment to environmental stewardship and corporate social responsibility, thereby enhancing their reputation and competitiveness in the market (Ofoegbu & Odoemelam, 2018).

However, the practice of environmental disclosure is not without challenges and complexities. Companies often face difficulties in determining what information to disclose, how to accurately measure and report their environmental impacts, and balancing the need for transparency with concerns about competitive disadvantage or reputational risks (Abubakar & Moses, 2020). Moreover, the lack of standardised reporting frameworks and guidelines complicates the comparability and reliability of environmental disclosure across organisations and industries (Yunusa, 2017). Additionally, there may be discrepancies between disclosed environmental information and actual environmental performance, raising questions about the credibility and integrity of disclosure practices. Despite these challenges, the importance of environmental disclosure continues to grow, driven by increasing awareness of environmental issues, regulatory pressures, and the demand for sustainable business practices from various stakeholders.

## **2.2 Corporate Governance Mechanism**

Corporate governance mechanisms encompass various structures and processes within an organisation that aim to ensure effective oversight, accountability, and transparency in decision-making, particularly at the level of the board of directors. Key components of corporate governance mechanisms include board gender, board size, board meetings, and board independence. Board gender refers to the representation of both men and women on the board of directors (Emmanuel et al., 2018). Majumder et al. (2017) suggests that diverse boards, including gender diversity, bring a broader range of perspectives and experiences to decision-making processes, leading to better governance outcomes. Moreover, board gender reflects a commitment to equality and inclusivity within the organisation and may contribute to improved performance and stakeholder satisfaction (Baalouch et al., 2019).

Board size relates to the number of directors serving on the board (Chams & García-Blandón, 2019; Hu & Loh, 2018). While there is no universally optimal board size, smaller boards tend to be more agile and efficient in decision-making, facilitating better communication and coordination among board members. Conversely, larger boards may face challenges in achieving consensus and may suffer from decision-making delays or inefficiencies (Abdu et al., 2020). Finding the right balance in board size is essential for ensuring effective governance and oversight.

Board meetings refers to the regularity with which the board convenes to discuss and make decisions on corporate matters (FRCN, 2018). Regular board meetings provide opportunities for directors to review company performance, assess risks, and provide strategic direction (Majumder et al., 2017). However, excessive meetings may lead to 'meeting fatigue' and detract from directors' ability to focus on critical issues (Yunusa, 2017). Conversely, infrequent meetings may result in inadequate oversight and responsiveness to emerging challenges (Odoemelam & Okafor 2018). Therefore, optimising the frequency of board meetings is crucial for maintaining effective governance practices.

Board independence refers to the extent to which directors are free from conflicts of interest and external influence, allowing them to act in the best interests of the company and its stakeholders (Jeroh, 2018; Lipinski, 2018). Independent directors bring objectivity and impartiality to board deliberations, enhancing oversight and accountability (Eriabie & Odia 2016). Furthermore, independent boards are better positioned to challenge management decisions, promote transparency, and safeguard shareholder interests. Ensuring a sufficient level of board independence is essential for upholding corporate governance standards and fostering trust among stakeholders (Odoemelam and Okafor 2018).

### **2.3 Audit Firm Choice**

The moderating variable in this study, audit firm choice, may play a significant role in influencing the relationship between corporate governance mechanisms and environmental accounting disclosure (Welbeck et al., 2017). Audit firms act as external validators of a company's financial and non-financial information, including its environmental disclosures. The choice of audit firm can impact the rigor and reliability of environmental audits and the extent to which environmental disclosures conform to standards and regulations (Eriabie & Odia, 2016). Therefore, understanding how audit firm choice moderates the relationship between corporate governance mechanisms and environmental disclosure is crucial for enhancing the effectiveness of environmental reporting practices.

However, variations in audit firm practices and competencies may affect the quality and consistency of environmental audits and disclosures (Jamil & Mardawi, 2021; Orazalin, 2019). By investigating how audit firms' choice influences the relationship between corporate governance mechanisms and environmental disclosure, this study aims to provide insights into improving environmental reporting practices and enhancing corporate governance effectiveness in Nigeria.

### **2.2 Agency Theory**

Agency theory, posited by Jensen and Meckling (1976), elucidates the dynamic between principals and agents. This theory acknowledges the inherent conflict between owners (or principals) and managers, as outlined by Issa et al. (2021). The crux of the agency problem lies in the disjunction between ownership and control, leading to a disparity in knowledge and information accessibility between shareholders (or investors) and corporate managers. To mitigate this conflict of interest, agency theory advocates for information disclosure as a means of aligning the interests of shareholders and corporate managers. Principals established monitoring systems to ensure managers act in their best interests (Issa et al., 2021; Yunusa, 2017).

Over time, various corporate mechanisms have been employed to address information asymmetry and reduce conflicts inherent in agency relationships. The Board, serving as a monitoring mechanism, aims to balance the interests of management and shareholders by overseeing both financial and non-financial disclosures (Yunusa, 2017). Effective board monitoring fosters the disclosure of high-quality information, thereby diminishing information asymmetry and associated agency conflicts. The efficacy of board monitoring hinges on attributes such as board gender, board size, board meetings, board independence, and the choice of audit firm.

#### **2.3.1 Board Size and Environmental Disclosure**

The term board size refers to the total number of directors serving on a company's board. It is considered a valuable tool for monitoring corporate governance (Majumder et al.,

2017) A larger board tends to lead to more reporting actions, but excessive size can hinder effective supervision of corporate operations (Majumder et al., 2017). A larger board is thought to demonstrate management capacity and reduce knowledge disparities among managers and stakeholders (Abdu et al. 2020). Abdu et al. (2020) argue that more directors bring a wider range of expertise, enhancing the quality of disclosure. Research on the relationship between board size and environmental disclosure presents mixed findings. Some studies show a positive relationship (Agyemang et al., 2020; Gerged, 2020; Ika et al., 2021; Iredele & Moloi, 2020; Kilincarslan et al., 2020; Okere et al., 2021; Yanto & Maulia, 2020), while others report a negative (See for instance Okafor et al., 2022). Some studies find insignificant relationships (See for instance Aliyu, 2019; Fernandes et al., 2018; Haladu & Salim, 2017; Pucheta-Martínez & López-Zamora, 2018).

### **2.3.2 Board Meetings and Environmental Disclosure**

Board meetings serve as the primary forum for the board to conduct business and achieve the company's strategic objectives. According to Financial Reporting Council of Nigeria (2018), it is recommended that the Board of Directors convene at least once a quarter to effectively carry out its oversight responsibilities and evaluate management performance. The frequency of board meetings is indicative of how well the board can address organisational challenges, as noted by Majumder et al., (2017). Environmental disclosure is increasingly important to stakeholders, leading to the expectation that environmental issues will be regularly discussed during board meetings to protect stakeholders' interests. Research on the relationship between board meetings and environmental disclosure has produced mixed findings. Agyemang et al. (2020) and Aliyu (2019) found a positive and significant relationship, while Odoemelam and Okafor (2018) and Pucheta-Martínez and López-Zamora (2018) found a positive but insignificant relationship.

### **2.3.3 Board Independence and Environmental Disclosure**

Board independence refers to the proportion of independent directors on a board of directors. In line with agency theory, independent directors are tasked with prioritising shareholders' interests in board decision-making (Fama & Jensen, 1983). They play an important role in steering a company environmental responsibility, contributing to effective corporate governance and safeguarding stakeholders' interests (Majumder et al., 2017). Various studies have explored the relationship between board independence and environmental disclosures where by research in this area has yielded mixed results. Egbunike et al. (2018), Agyemang et al. (2020), Gerged (2020), Giannarakis et al. (2019) and Aliyu (2019) found positive relationship while Kilincarslan et al. (2020), (Rabi (2019) and (Liu et al. (2019) found negative relationship. Mahmood et al. (2018) reported an insignificant relationship.

### **2.3.4 Audit Firm Choice as Moderating Variable**

In the preceding review, there are varying results regarding the relationship between Corporate Governance Mechanisms (such as Board Size, Board Meetings, and Board Independence) and Environmental Disclosure. Audit Firm Choice serves as the moderating variable due to factors like audit quality, independence and objectivity, expertise in environmental matters, regulatory compliance, and market perception. The selection of an audit firm can significantly impact how corporate governance mechanisms impact environmental disclosure. Firstly, a reputable audit firm is likely to conduct a thorough audit, ensuring compliance with standards and regulations. Secondly, the independence and

objectivity of the audit firm are crucial, as bias or conflicts of interest could compromise disclosure reliability. Thirdly, firms with expertise in environmental auditing are better equipped to evaluate governance mechanisms' effectiveness.

Additionally, audit firms ensure regulatory compliance, affecting the alignment between governance mechanisms and environmental disclosure. Lastly, stakeholders rely on audit reports for assessing a company's credibility, with the audit firm's reputation influencing perceptions. Overall, the choice of audit firm plays an important role in determining how effectively governance mechanisms promote environmental disclosure. Hypotheses were developed to explore this moderating effect.

H0<sub>1</sub>: Audit firm choice do not moderate the relationship between board size and environmental disclosure.

H0<sub>2</sub>: Audit firm choice do not moderate the relationship between board meetings and environmental disclosure.

H0<sub>3</sub>: Audit firm choice do not moderate the relationship between board independence and environmental disclosure.

### 3. Data and Methods

Correlational research design was employed. The study targeted 74 non-service companies listed in Nigeria across various sectors such as agriculture, oil and gas, conglomerates, natural resources, constructions/real estate, industrial goods, consumer goods, and healthcare as of December 31st, 2023. Employing a census technique, efforts were made to gather data from all entities within the population. However, 23 companies were excluded due to insufficient data availability in their annual reports from 2018 to 2022, resulting in an adjusted sample of 51 companies. Data was sourced from annual financial reports, sustainability reports, and compliance reports with the Nigerian Code of Corporate Governance spanning from 2018 to 2022. The timeframe selection considers the adoption of the NCCG in 2018 by the Financial Reporting Council of Nigeria (FRCN) and revisions to the GRI framework implemented in 2018. Environmental disclosure, the dependent variable, was measured through a structured checklist based on the Global Reporting Initiative guideline (Yunusa, 2017). Subsequently, a coding system utilising "0" and "1" was applied, followed by a content analysis to compute the disclosure of environmental information using a simple un-weighted average formula (Yunusa, 2017).

The ED index of a company was determined using the equation adapted from. Yunusa (2017) as shown below:

$$ED = \sum \frac{ED}{HPD} \quad (1)$$

Where-

**ED** = Environmental Disclosure

**HPD** = Highest possible disclosure score

The explanatory variables for this study encompass three corporate governance mechanisms and one moderating variable. Board size refers to the total number of directors within a corporation during a specific accounting period, excluding the company secretary (Chams & García-Blandón, 2019; Hu & Loh, 2018). Board meetings are measured by the frequency of directorial gatherings throughout the accounting period (Jizi & Dah, 2018; Younas et al., 2021). Board independence is determined by the ratio of independent non-executive directors to the total number of directors (Jeroh, 2018; Lipinski, 2018).

The moderating variable, audit firm choice, is represented as a dummy variable, with "1" assigned to companies employing "Big 4" audit firms (EY, Deloitte, KPMG, and PWC) as external auditors, and "0" otherwise (Bani-khalid et al., 2017; Ramadhini et al., 2020). Return on assets serves as the control variable, calculated by dividing after-tax profit

by total assets (Abu Qa'dan & Suwaidan, 2019). Firm leverage is also a control variable which was computed by dividing total liabilities by total assets (Chams & García-Blandón, 2019; Shuaibu, 2020).

The theoretical model is specified thus:

$$ED = f(\text{CGMs}) \quad (1)$$

The specification of the econometric model for the unmoderated model is detailed as follows:

$$ED_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BM_{it} + \beta_3 BI_{it} + \beta_4 FL_{it} + \beta_5 ROA_{it} + \varepsilon_{it} \quad (2)$$

The moderated model is specified thus:

$$ED_{it} = \beta_0 + \beta_1 AFCx BS_{it} + \beta_2 AFCx BM_{it} + \beta_3 AFCx BI_{it} + \beta_4 FL_{it} + \beta_5 ROA_{it} + \varepsilon_{it} \quad (3)$$

Where:

ED = Environmental Disclosures;

BS = Board Size;

BM = Board Meetings;

BI = Board Independence;

AFC = Audit Firm Choice;

FL = Firm Leverage;

ROA = Return on Assets.

$\beta_0$  = Intercept;

$\beta_1$  to  $\beta_3$  = Coefficient of independent variables;

$\beta_4$  and  $\beta_5$  = Coefficient of control variables;

$\varepsilon$  = Error terms;

it = Longitudinal data indicator;

#### 4. Data Analysis and Discussion of findings

##### 4.2 Descriptive Statistics

This section presents and discusses the data collected throughout the study, including descriptive statistics, correlation matrix, and inferential statistics.

**Table 1: Descriptive Statistics**

Variables	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
ED	255	0.15	0.20	0	0.97	1.50	4.58
BS	255	9.08	3.03	3	18	0.37	2.65
BM	255	4.96	1.77	1	13	1.54	7.62
BI	255	0.16	0.15	0	0.60	0.58	2.40
AFC	255	0.60	0.49	0	1	-0.39	1.15
FL	255	0.63	0.34	0.07	2.43	1.94	8.93
ROA	255	2.79	0.14	-0.78	76.58	-1.27	16.41

**Source: Author's Computation (2024).**

This environmental disclosure reflects how much a firm reveals about its environmental practices. At the lowest value of zero, some listed non-service companies do not disclose environmental information, while at the highest disclosure of 97%, some firms provide extensive details. On average, non-service companies disclose environmental information at a relatively low level, with significant variability across companies, as indicated by the mean value of 15% and a notable standard deviation 0.23. The positive skewness of approximately 1.50 suggests a right-skewed distribution, possibly due to some companies with high levels of environmental disclosure pulling the mean upward. The high kurtosis of 4.58 indicates a heavy-tailed distribution, potentially with outliers on the higher end of the disclosure spectrum.

Board size reflects the number of directors on the board. Ranging from three to 18 directors, with an average of nine, there is notable variability as indicated by the standard deviation of 3.03. The slightly positively skewed distribution (skewness: 1.54) suggests more companies may have larger boards. The kurtosis of 7.62 indicates heavier tails than a normal distribution, highlighting variability in board sizes. Board Meetings records the number of board meetings held. Ranging from one to 13 meetings, with an average of five, there is minimal variability (standard deviation: 1.77). The positively skewed distribution (skewness: 1.54) suggests more companies hold a higher number of board meetings, potentially indicating more active boards.

Board Independence measures the proportion of independent non-executive directors on the board. Ranging from zero to 60%, with an average of 16%, boards exhibit relatively low levels of independence. The distribution shows slight positive skewness (skewness: 0.58) and heavier tails than normal (kurtosis: 2.41), indicating variability in board independence levels. Audit Firm Choice is a binary variable, where one indicates the use of a Big 4 audit firm and zero otherwise. Ranging from zero to one, with a mean of 60%, companies tend to prefer Big 4 audit firms. The positive skewness suggests more companies may choose non-Big 4 audit firms. The kurtosis indicates less variability in audit firm choice, as supported by a low standard deviation of 0.49.

Firm Leverage, a control variable, represents the extent to which a company relies on debt financing. On average, companies have a leverage ratio of approximately 0.63. Positive skewness suggests more firms have higher leverage ratios, while high kurtosis indicates heavy tails, possibly reflecting firms with exceptionally high leverage ratios. Return on assets as a control variable is a profitability measure, shows an average of approximately 2.79%. Negative skewness suggests more firms may have lower returns on assets, while high kurtosis indicates a distribution with heavy tails, potentially reflecting firms with exceptionally high or low returns on assets.

## 4.2 Correlation Matrix

**Table 2 Correlation Matrix**

	ED	BS	BM	BI	AFC	FL	ROA
ED	1.0000						
BS	0.3690	1.0000					
BM	0.3399	0.4145	1.0000				
BI	0.1788	0.2431	0.3171	1.0000			
AFC	0.2659	0.3903	0.4070	0.3201	1.0000		
FL	-0.1390	-0.2016	-0.1449	-0.1484	-0.2752	1.0000	
ROA	0.2555	0.1287	0.0240	0.3155	0.1633	-0.1872	1.0000

**Source: Author's Computation (2024).**

The correlation matrix presented in Table 2 indicates that Environmental Disclosure (ED) demonstrates a positive correlation with most independent variables (BS, BM and BI), Moderating variable (AFC) and control variables ROA, except for FL, which displays a negative correlation with ED. This suggests that these variables generally move in the same direction as environmental disclosure, except for FL, which moves in the opposite direction. Furthermore, Table 2 illustrates the relationships among the independent variables themselves. According to Gujarati (2004), a correlation coefficient exceeding 0.80 between two independent variables is considered excessive. However, in this analysis, all correlation coefficients among the variables are below 0.80, indicating the absence of harmful multicollinearity.



To delve deeper into the issue of collinearity, this study employed the Variance Inflation Factor (VIF) test. The VIF test estimates variance factors for each variable, with results ranging from a minimum of 1.12 to a maximum of 1.40, all comfortably below the threshold of 5. Additionally, the mean VIF is calculated as 1.28, with the minimum inverse VIF at 0.72 and the maximum inverse VIF at 0.89. These findings further confirm the absence of multicollinearity among all the variables under study (Hair et al., 2014).

#### 4.3 Corporate Governance Mechanism and Environmental Disclosure in Nigeria: Audit Firm as Moderator

Before conducting the final regression analysis, this research performed diagnostic tests to ensure the integrity of the parameters, following the recommendation of Wooldridge (2020). In addition to examining multicollinearity, briefly discussed alongside correlation, the study utilised the Hausman test to choose between random and fixed effect models. The statistically insignificant p-value of 0.6279 favoured the adoption of the random effect model for this study. Moreover, a normality test was conducted on the data using jarque Bera test, revealing in significant p-value of 0.5294, indicating normal distribution of the residual of the data.

Furthermore, the heteroskedasticity test conducted using Modified Wald Group Wise yielded a significant result with a p-value of 0.000, indicating the presence of heteroskedasticity. Heteroskedasticity violates the assumption of homoscedasticity and may lead to erroneous inferences. As a result, the study employed the Generalised Least Squares (GLS) regression technique to address the issue of heteroskedasticity. This technique is particularly suitable for handling panel data, which comprises both cross-sectional and time-series components. In this case, the model adjusts for heteroskedasticity, acknowledging that the variability of the dependent variable, ED, may differ across various groups or entities and over time. Following the recommendation of Gujarati (2004), the GLS technique was implemented, and the subsequent discussion focused on its outcomes. Below, Table 3 presents the results of the regression with Generalised Least Square (GLS).

**Table 3: Feasible Generalised Least Square Regression**

ED	Coefficients	Std. Error	Z-statistics	P-values
AFCBS	-0.0013	0.0031	-0.43	0.667
AFCBM	0.015**	0.0052	2.90	0.004
AFCBI	0.3421***	0.0548	6.24	0.000
FL	0.0040	0.0137	0.29	0.772
ROA	0.0010	0.0005	2.17	0.030
CONSTANT	0.0089	0.0130	0.68	0.494

Coefficient: GLS

Panels: heteroskedastic

Correlation: no autocorrelation

Estimated covariance = 51

Estimated autocorrelations = 0

Estimated coefficients = 6

Number of observations = 255

Time period = 5

Number of groups = 51

Wald chi2 (5) = 528.82

Prob>chi2 = 0.0000

R-Squared = 0.16

T-statistics in parentheses \*\*\*p<0.01, \*\*p<0.05.

**Source: Author's Computation (2024).**

The findings presented in Table 3 depict the outcomes derived from the Generalised Least Square (GLS), following a comprehensive analysis of the pertinent tests. The coefficient of determination, denoted as R-squared, was computed at 0.16. This value signifies that approximately 16% of the variability observed in environmental disclosure can be attributed to fluctuations in the effect of moderating variable, as elucidated by the model. In essence, this suggests that factors such as, board size (BS), board meetings (BM) and board independence (BI) which were moderated by audit firm choice (AFC), along with the control variables, collectively elucidated 16% of the environmental disclosure among listed non-service companies in Nigeria. Importantly, this relationship is statistically significant at the 1% level, as evidenced by the p-value of 0.0000. Notably, the remaining 84% of variability can be attributed to other unaccounted factors, which are captured by the error term in the equation. Furthermore, the chi-square value of 528.82 demonstrates significance at the 1% level, affirming the model's robustness and suitability.

The analysis conducted reveals significant findings concerning various factors affecting environmental disclosure among listed non-service companies in Nigeria. Firstly, audit firm choice does not moderate the relationship between board size and environmental disclosure. The insignificant effect was evidenced by a probability value of 0.667. This result aligns with previous studies by Fernandes et al. (2018), Pucheta-Martínez and López-Zamora, (2018) and Aliyu (2019). Thus, the study supports the null hypothesis, suggesting that audit firm choice does not moderate the relationship between board size and environmental disclosure among listed non-service companies in Nigeria.

Secondly, the choice of audit firm positively moderates the relationship between board meetings and environmental disclosure. This significant relationship is evidenced by a probability value of 0.004 at the 5% level, with a coefficient of 0.015 and a z-value of 2.90. This indicates that the choice of audit firm moderates the relationship between board meetings and environmental disclosure, suggesting that when a company pays attention to its choice of audit firm, it may increase the effectiveness of its board meetings and improve environmental information disclosure. This finding is consistent with Agyemang et al. (2020) and Aliyu (2019), supporting the alternative hypothesis.

Similarly, the choice of audit firm positively and significantly moderates the relationship between board independence and environmental disclosure, with a z-value of 6.24, a coefficient of 0.3421, and a probability value of 0.000 at the 1% level. This indicates that audit firm choice moderates the relationship between board independence and environmental disclosure, supporting agency theory and previous findings by Abubakar and Moses (2020), Agyemang et al. (2020), Gerged (2020) and Giannarakis et al. (2019). Thus, the study finds support for the alternative hypothesis, suggesting that audit firm choice moderates the relationship between board independence and environmental disclosure among listed non-service companies in Nigeria.

## 5. Conclusion and Recommendations

The primary objective of this research is to explore how the choice of audit firm moderates the relationship between corporate governance mechanisms and environmental disclosure among listed non-service firms in Nigeria. The study underscores the important role played by board oversight in shaping environmental disclosures. Specifically, a greater presence of independent non-executive directors and frequent board meetings significantly enhance the disclosure of environmental information, particularly when the choice of audit firm is considered as a moderating variable.

Building upon the empirical findings, it is recommended that non-service companies exercise discretion in selecting their audit firm. The study highlights that the

choice of audit firm significantly moderates the relationship between board independence, board meetings, and environmental disclosure. It is imperative to recognise the influence of audit firm choice as a moderator and leverage this variable to optimise the impact of corporate governance mechanisms on environmental disclosure, thereby fostering a culture of sustainability and accountability.

Non-service companies should also pay attention to environmental issues in their regular board meetings, as board meetings positively influences environmental disclosure, especially when complemented by the right audit firm choice. Moreover, regular board independence, when coupled with the appropriate audit firm, can significantly enhance environmental disclosure. Embracing transparency as a cornerstone of corporate governance is crucial, facilitated by audit firm expertise to build trust with stakeholders through robust environmental disclosure practices.

Non-service companies are encouraged to integrate environmental disclosure into their corporate governance frameworks, developing comprehensive sustainability strategies supported by the right audit firm partnerships. By doing so, they can set new standards for corporate governance and sustainability reporting, driving positive change within the industry.

Regulatory bodies such as the Securities and Exchange Commission and the Financial Reporting Council of Nigeria should strengthen specific minimum criteria for board independence, board meetings, and audit firm choice. This would facilitate effective board oversight and enhance the credibility of information reported to stakeholders.

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