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Audit Committee Characteristics and Corporate Sustainability Reporting of listed Environmentally Sensitive Companies in Nigeria

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Abstract: This study explores the relationship between audit committee characteristics and sustainability reporting among listed environmentally sensitive companies in Nigeria. Using a longitudinal research design, the study draws on secondary data from 46 firms listed on the Nigerian Exchange Group over a ten-year period (2013–2022). The analysis, conducted through descriptive and inferential statistical methods, reveals that key audit committee attributes of size, diligence, and independence play a significant role in shaping the extent of sustainability disclosures. These findings suggest that strengthening audit committee structures can enhance transparency and accountability in environmental reporting practices. The study recommends that regulatory authorities develop incentive frameworks to promote sustainability reporting as a core aspect of corporate governance. Limitations relating to data availability and sectoral representation are acknowledged, and directions for future research are proposed to explore other governance mechanisms and cross-sectoral comparisons.

Keywords: Audit Committee Size, Audit Committee Diligence, Audit Committee Independence, Corporate Sustainability Reporting, Environmentally Sensitive Companies.

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1. INTRODUCTION

Sustainability reporting has gained increasing importance in corporate governance, evolving significantly since its early discussions in accounting literature. Traditional financial reporting, which primarily focuses on financial performance, has been criticised for overlooking the broader social and environmental impacts of corporate activities (Abdullahi & Makama, 2021). Kreps in 1940 was among the first to highlight these limitations, emphasising the need for a more comprehensive approach to corporate disclosure (Haladu, 2017). This laid the foundation for subsequent developments, including Bowen's proposal in 1953 for external auditors to assess corporate social responsibility (CSR) issues such as labour conditions and community relations.

By the 1970s, increasing global awareness of environmental and social issues prompted multinational corporations, particularly in the United States and Western Europe, to adopt the "Social Balance Sheet". This early form of sustainability reporting incorporated non-financial disclosures alongside traditional financial statements, highlighting corporate social and environmental responsibilities (Ohidoa & Ojeaga, 2023). Over time, sustainability reporting frameworks have expanded to include environmental, social, and governance (ESG) factors, signifying a broader transition toward corporate accountability and ethical business practices.

The audit committee (AC) plays a crucial role in ensuring transparency in sustainability disclosures. Its effectiveness is shaped by factors such as size, independence, and diligence, which influence its ability to oversee corporate governance and reporting processes. Regulatory bodies and corporate governance frameworks highlight the need for a well-structured audit committee to strengthen corporate accountability and enhance financial oversight.

Given the growing demand for corporate transparency, this study examines the impact of audit committee characteristics, specifically size, independence, and diligence, on sustainability disclosures among listed environmentally sensitive firms in Nigeria. Additionally, firm age, board size, and leverage are incorporated as control variables to provide a more comprehensive analysis. This research contributes to the ongoing discourse on sustainability reporting by offering empirical insights within the context of a developing economy, where sustainability practices and reporting frameworks are still evolving.

1.1. Statement of the Problem

Sustainability reporting has become an essential aspect of corporate governance, as organisations are increasingly held accountable for their environmental, social, and economic impacts. However, the effectiveness of sustainability disclosure largely depends on corporate governance mechanisms, particularly the audit committee. Prior studies have examined various audit committee characteristics, such as size, independence, and diligence, in relation to sustainability reporting, but their findings remain inconclusive. While some researchers argue that a larger audit committee enhances sustainability reporting (Ohwo & Audu, 2023; Afolabi *et al.*, 2022), others suggest a negative or insignificant relationship (Ohidoa & Ojeaga, 2023; Indriawati *et al.*, 2022). These inconsistencies indicate the need for further investigation into how audit committee attributes influence sustainability disclosures, especially within the context of environmentally sensitive industries in Nigeria.

Additionally, audit committee diligence, particularly meeting frequency, has been explored in prior literature with mixed results. Some studies have found a significant positive relationship between audit committee meetings and sustainability disclosure (Jubril *et al.*, 2022; Aruwa *et al.*, 2021; Said *et al.*, 2020), suggesting that frequent meetings enhance transparency and accountability. Conversely, other studies have reported an insignificant effect (Khoiriyah *et al.*, 2022), raising concerns about whether meeting frequency alone is sufficient to drive sustainability reporting. This inconsistency suggests that additional factors, such as audit committee expertise and regulatory compliance, may moderate the relationship between audit committee diligence and sustainability reporting, thereby necessitating further empirical investigation.

The impact of audit committee independence on sustainability reporting remains inconclusive, as existing studies present mixed findings. While some researchers suggest that independent audit committees enhance sustainability disclosure (Afolabi *et al.*, 2022; Rozsolova & Dohnalova, 2023), others report either an insignificant or negative effect (Hasan *et al.*, 2021; Ohidoa & Ojeaga, 2023). These inconsistencies indicate that industry-specific regulations, corporate governance structures, and contextual factors may influence the effectiveness of independent audit committees in promoting sustainability reporting.

Given the evolving landscape of sustainability disclosure in Nigeria, there is a need for empirical research to provide a clearer understanding of how audit committee characteristics shape reporting practices. This study seeks to address this gap by investigating the impact of audit committee size, independence, and diligence on sustainability reporting among listed environmentally sensitive firms in Nigeria.

1.2. Research Questions

Based on the research problem, the following questions guide this study:

(i) How does audit committee size influence corporate sustainability reporting among listed environmentally sensitive companies in Nigeria?
(ii) What is the impact of audit committee diligence on corporate sustainability reporting among listed environmentally sensitive companies in Nigeria?
(iii) To what extent does audit committee independence affect corporate sustainability reporting among listed environmentally sensitive companies in Nigeria?

1.3. Objectives of the Study

Derived from the research questions, the primary objective of this study is to examine the relationship between audit committee characteristics and corporate sustainability reporting among listed environmentally sensitive companies in Nigeria. The specific objectives are to:

(i) Analyze the effect of audit committee size on corporate sustainability reporting among listed environmentally sensitive companies in Nigeria.
(ii) Investigate the impact of audit committee diligence on corporate sustainability reporting among listed environmentally sensitive companies in Nigeria.
(iii) Assess the influence of audit committee independence on corporate sustainability reporting among listed environmentally sensitive companies in Nigeria.

1.4. Research Hypotheses

To achieve the study objectives, the following null hypotheses (H_0) will be tested at a 5% significance level:

- H_{01}: Audit committee size has no significant impact on corporate sustainability reporting among listed environmentally sensitive companies in Nigeria.
- H_{02}: Audit committee diligence has no significant impact on corporate sustainability reporting among listed environmentally sensitive companies in Nigeria.
- H_{03}: Audit committee independence has no significant impact on corporate sustainability reporting among listed environmentally sensitive companies in Nigeria.

2. LITERATURE REVIEW

2.1. Conceptualization of Corporate Sustainability Reporting

Sustainability reporting, often referred to as Corporate Social Responsibility (CSR) or Triple Bottom Line (TBL) reporting, demonstrates an organization's dedication to generating value across social, economic, and environmental dimensions (Haladu, 2017). It enhances corporate resilience by providing transparency on Environmental, Social, and Governance (ESG) performance to stakeholders (KPMG, 2022). Unlike conventional financial reporting, which focuses solely on economic outcomes, sustainability reporting incorporates environmental and social considerations, offering a more holistic perspective on corporate accountability (Afolabi *et al.*, 2022). The adoption of sustainability reporting is supported by various theoretical frameworks, including legitimacy theory, which posits that companies disclose ESG information to align with societal expectations (Abdullahi & Makama, 2021), and stakeholder theory, which highlights the importance of addressing the interests of investors, regulators, and communities (Afolabi *et al.*, 2022).

International frameworks such as the Global Reporting Initiative (GRI) and ISO standards provide guidelines that improve the consistency and reliability of sustainability disclosures (Usman & Yahaya, 2023). Organizations leverage sustainability reporting as a strategic approach to enhancing transparency, managing risks, and attracting investment (Haque, 2017; Githaig & Kosgei, 2022). The growing significance of sustainability reporting is attributed to increasing environmental and social challenges, regulatory requirements, and the drive for long-term value creation (KPMG, 2016). Integrating sustainability reporting into corporate governance structures fosters ethical

business practices, minimizes financial risks, and builds stakeholder confidence, ultimately contributing to sustainable corporate growth (Usman & Amran, 2015; Mohammed *et al.*, 2024).

2.1.1. Environmental Sustainability

Environmental sustainability gained prominence during the United Nations Climate Change Conference (COP26) in 2021, highlighting the importance of environmental disclosures in addressing climate change and enhancing corporate transparency (United Nations, 2021). Environmental disclosure fosters stakeholder engagement by integrating sustainability into financial statements, quantifying ecological costs, and outlining corporate commitments to environmental conservation (Mbu-Ogar *et al.*, 2023; Orajekwe & Ogbodo, 2023). Beyond financial data, environmental sustainability reporting includes social costs from production externalities, regulatory compliance investments, and corporate contributions to community welfare (Mgbame *et al.*, 2020). It details material usage, energy consumption, emissions, and waste management, following frameworks such as the Global Reporting Initiative (GRI, 2016), and is particularly critical for industries with high ecological footprints, such as the energy sector in sub-Saharan Africa, where reporting standards remain insufficient (Nweze & Nwadialor, 2020). Neglecting environmental responsibilities can result in reputational damage, financial losses, and regulatory penalties, while employee competence in sustainability practices plays a crucial role in mitigating environmental risks (Jeroh, 2020; Okanga & Gronewald, 2017). Despite increasing global demand for corporate environmental disclosures, developing countries often exhibit lower reporting levels due to weak regulatory enforcement and limited stakeholder pressure (Ismail & Rahman, 2016). Strengthening environmental reporting through alignment with sustainability strategies and adherence to structured guidelines, such as the GRI G4 Sustainability Code, enhances corporate transparency, stakeholder engagement, and long-term environmental accountability (Moratis, 2018; Lodhia, 2018).

2.1.2. Economic Sustainability

Corporate entities strive for desirable economic performance, which is essential for economic growth but often comes at the cost of severe environmental

consequences, including industrial waste, air pollution, oil spills, and resource depletion (Ikpor *et al.*, 2022). These challenges have raised global concerns, necessitating the adoption of sustainable practices to balance economic benefits with environmental preservation (Okoba & Chukwu, 2023). Economic sustainability, which ensures long-term economic benefits for both present and future generations, requires corporations to disclose their impact on stakeholders and the broader economic system, emphasizing sustainable economic practices in decision-making (Haladu, 2017). The Global Reporting Initiative (GRI, 2016) framework highlights key economic performance indicators such as market presence, taxation, anti-corruption measures, indirect economic impacts, anti-competitive behavior, and procurement practices, enabling stakeholders to assess an organization's economic sustainability (Afolabi *et al.*, 2022). Additionally, the G4 Sustainability Code provides structured guidelines for economic reporting, promoting transparency and informed stakeholder decisions regarding corporate viability and commitment to sustainable economic practices.

2.1.3. Social Sustainability

Social sustainability emphasizes protecting political and economic rights, ensuring ethical corporate governance, safeguarding labor rights, promoting community development, and enhancing overall human well-being, fostering stakeholder trust and long-term operational efficiency (Abdulsalam *et al.*, 2020). The Global Reporting Initiative (GRI, 2016) outlines key social sustainability disclosures, including fair employment conditions, job security, and decent work opportunities. Labor-management relations emphasize mutual respect and conflict resolution, while occupational health and safety ensure workplace security. Training and education initiatives enhance adaptability, and diversity policies promote inclusivity, preventing discrimination based on gender, race, or ethnicity (Samuel, 2020). Beyond workplace practices, corporations must eliminate child and forced labor, uphold ethical security practices, and respect indigenous rights and cultural heritage. Human rights assessments reinforce compliance with global principles, while community engagement fosters social and economic development. Supplier assessments ensure ethical labor practices and sustainable supply chains, while responsible public policy advocacy, customer health and safety, and ethical marketing enhance corporate

accountability. Upholding privacy protection and regulatory compliance strengthens transparency, reinforcing corporate responsibility and long-term resilience (Haladu, 2017).

2.2.1. Audit Committee and Sustainability Reporting

Audit Committees in listed corporate entities play a vital role in sustainability disclosure by overseeing reporting policies, ensuring data accuracy, and maintaining regulatory compliance (Ohwo & Audu, 2023). They assess materiality to prevent information asymmetry (Abdulwahab *et al.*, 2023) and manage ESG risks that affect financial and social performance (Zainabu *et al.*, 2022). Additionally, they facilitate third-party verification to enhance disclosure credibility and engage stakeholders to align sustainability reporting with expectations. By integrating ESG metrics with financial reporting, Audit Committees promote transparency, strengthen corporate reputation, attract investors, and support sustainable business practices (Chinonyelum & Ndubuisi, 2022; Adegboye *et al.*, 2020).

2.2.2.1 Audit Committee Size: Audit committees play a crucial role in corporate governance by overseeing management decisions, ensuring auditor independence, and supporting business policy formulation (Selven *et al.*, 2022). While larger audit committees can enhance expertise and voluntary disclosures, they may also slow decision-making (Ohidoa & Ojeaga, 2023). Resource dependence theory suggests that larger committees allocate more resources to oversight, thereby improving corporate disclosure (Indriawati, *et al.*, 2022). In Nigeria, CAMA (2020) mandates a five-member audit committee, including shareholders and non-executive directors, with at least one financial expert, while Section 359 outlines responsibilities such as ensuring compliance, reviewing audits, and recommending external auditors. A well-structured audit committee positively influences sustainability reporting (Aimatari *et al.*, 2014; Raimo *et al.*, 2020). While some studies affirm that larger audit committees enhance sustainability disclosures (Aprianti *et al.*, 2021; Khoiriyah *et al.*, 2022), others report a negative relationship (Indriawati *et al.*, 2022; Ohidoa & Ojeaga, 2023), highlighting the need for further research on the impact of audit committee size on sustainability reporting.

2.2.2.2. Audit Committee Diligence: Audit committee meeting frequency is a critical factor influencing its effectiveness, as regular meetings enhance

oversight, improve financial statement quality, and strengthen corporate governance (Ohwo & Audu, 2023). In Nigeria, audit committees are required to meet at least four times annually (FRCN, 2018), with studies suggesting that increased meeting frequency strengthens monitoring, prevents managerial opportunism, and enhances sustainability disclosures (Said *et al.*, 2020; Raimo *et al.*, 2020). However, research findings on its impact vary; while some studies indicate a positive and significant effect (Aruwa *et al.*, 2021; Jubril *et al.*, 2022), others report an insignificant or negative relationship (Khoiriyah *et al.*, 2022), necessitating further investigation into its influence on sustainability reporting.

2.2.2.3. Audit Committee Independence: Audit committee independence enhances corporate governance, financial transparency, and regulatory compliance by minimizing conflicts of interest and ensuring objective oversight (Aruwa *et al.*, 2021; Afolabi *et al.*, 2022). Independent committees, primarily composed of non-executive directors, strengthen accountability, mitigate fraud, and reduce information asymmetry (Meutia *et al.*, 2023; Hasan, 2021). The Sarbanes-Oxley Act (2002) mandates independence in publicly listed firms to promote governance integrity (Adegboye *et al.*, 2020).

The impact of audit committee independence on sustainability disclosures remains debated. While some studies show a positive influence on ESG reporting (Asaolu *et al.*, 2022; Rozsolova & Dohnalova, 2023), others find no significant effect (Apprianti *et al.*, 2021; Ohidoa & Ojeaga, 2023). These mixed results highlight the need for further research to assess its role in improving sustainability reporting and corporate accountability.

2.3. Theoretical Framework

2.3.1. Agency Theory

Agency theory, initially proposed by Berle and Means (1932) and later refined by Jensen and Meckling (1976, 2004), explores the relationship between principals (shareholders) and agents (corporate executives). In this framework, shareholders entrust managers with decision-making responsibilities, which can result in conflicts of interest. Agents may act in their own self-interest rather than prioritizing shareholder value, giving rise to challenges such as information asymmetry and moral hazard (Teixeira, 2017).

In emerging economies like Nigeria, factors such as family ownership and weak legal protections exacerbate agency problems (Young *et al.*, 2001).

Audit committees play a crucial role in mitigating these conflicts by enhancing oversight and reducing information asymmetry (Velasco, 2006). Agency costs, including monitoring and residual losses, arise when shareholders must ensure management acts in their best interests (Jensen & Meckling, 1976).

Effective audit committees improve transparency, minimize agency costs, and align management decisions with shareholder interests. By overseeing accurate sustainability disclosures, they strengthen corporate governance and foster trust between stakeholders (Fama, 1980).

2.3.2. Stakeholders Theory

Stakeholder theory, developed by Freeman (1984), expands corporate governance beyond shareholders to include all individuals and groups affected by a firm's activities. Stakeholders are classified as primary (essential for survival) or secondary (influenced by operations but not crucial) (Shankman, 1999). The theory highlights corporate social responsibility (CSR) and the need to balance diverse stakeholder interests rather than focusing solely on profit maximization (Harrison *et al.*, 2015).

Unlike agency theory, which prioritizes shareholder-management alignment, stakeholder theory advocates for ethical corporate governance, emphasizing transparency and accountability (Keay, 2010; Freeman *et al.*, 2004). Effective stakeholder engagement fosters long-term success by addressing power imbalances and ensuring responsible management (Rawlins, 2006).

This study integrates agency and stakeholder theories to examine how audit committee characteristics influence sustainability disclosures among Nigerian listed firms. While agency theory focuses on minimizing shareholder-management conflicts, stakeholder theory broadens the scope to encompass corporate environmental and social responsibilities. This combined approach provides a comprehensive understanding of governance and sustainability reporting in sensitive sectors.

2.3.3. Legitimacy Theory

Legitimacy theory explains how corporations align their actions with societal norms to maintain their "social license to operate" (Lindblom, 2015). A "legitimacy gap" arises when corporate behavior falls short of societal expectations, risking reputational damage (Deegan, 2007). Companies address

this by using legitimacy tactics, such as enhancing sustainability disclosures, to reinforce stakeholder trust and avoid legal or public backlash.

Bhattacharyya and Rahman (2019) categorize legitimacy into pragmatic (stakeholder interests), cognitive (societal perception), and moral (ethical justification). Transparency through sustainability reporting strengthens corporate reputation and mitigates risks (Gibson *et al.*, 2005). Triple Bottom Line (TBL) reporting, which includes financial, social, and environmental performance, furthers this alignment (Geol, 2010).

Companies operating in environmentally sensitive industries tend to disclose more sustainability-related information to maintain legitimacy and minimize regulatory scrutiny (Llena *et al.*, 2007; Hernandez, 2007). While aligning with stakeholder theory by emphasizing corporate accountability, this perspective specifically highlights the importance of preserving public trust. It serves as a valuable framework for understanding how audit committees contribute to sustainability disclosures and corporate governance.

2.3.4. Resource Dependency Theory (RDT)

Resource Dependence Theory (RDT) explains why firms disclose sustainability information, emphasizing their reliance on external resources for long-term viability (Emerson, 1962; Pfeffer & Salancik, 1978). To secure critical resources and reduce uncertainty, firms establish interdependent relationships and enhance communication through disclosures, particularly in socially and environmentally sensitive industries (Heide, 1994; Hollos *et al.*, 2012).

The audit committee plays a vital role in this process by providing expertise, credibility, and external linkages that strengthen sustainability reporting (Ben-Amar *et al.*, 2017). A well-structured audit committee enhances transparency, attracts valuable resources, and ensures corporate accountability (Helfaya & Moussa, 2017).

This study integrates multiple theoretical perspectives: agency theory, which highlights the audit committee's role in mitigating agency costs; stakeholder and legitimacy theories, which emphasize reducing information asymmetry and enhancing corporate reputation; and RDT, which underpins the panel regression model by explaining how firms strategically manage resources to maintain competitive advantages. Collectively, these theories provide a comprehensive framework for examining the impact of audit committee characteristics on sustainability disclosures.

2.4. Empirical Review

2.4.1. Audit Committee Size and Sustainability Reporting

Wahome *et al*. (2025) examined audit committee characteristics effect on corporate sustainability disclosure among listed East African firms. Using 708 firm-year observations (2012–2022) which was anchored on stakeholder and legitimacy theories, the study found that audit committee size positively impact sustainability reporting disclosures. The results highlight the audit committee's vital role in promoting accountability within East Africa's evolving corporate governance landscape.

Ohwo and Audu (2023) analyzed how audit committee characteristics influence sustainability reporting in Nigerian deposit money banks. Utilizing an ex-post facto research design and multiple regression analysis on secondary data from 2013 to 2022, their findings suggest that a larger audit committee size enhances sustainability reporting. They recommend increasing audit committee size to improve disclosure practices.

Ohidoa and Ojeaga (2023) explored the relationship between audit committee attributes and sustainability reporting in Nigeria. Using pooled panel regression analysis on data from 2014 to 2022, they found that audit committee size negatively impacts sustainability reporting. They suggest aligning audit committee size and composition with legal requirements to enhance reporting effectiveness.

Meutia *et al*. (2023) investigated the link between audit committee characteristics and sustainability reporting in Indonesian banks. Through cross-sectional and time-series analyses on data from 2015 to 2019, they found that audit committee size positively affects sustainability disclosure. They recommend strengthening audit committee attributes to enhance reporting quality.

Jubril *et al*. (2022) examined the influence of audit committee characteristics on environmental disclosure in Nigeria. Analyzing 16 industrial and natural resource firms from 2015 to 2018 using content and regression analyses, they found a significant relationship between audit committee size and environmental disclosure. They advocate for mandatory disclosure policies for listed firms.

Afolabi *et al*. (2022) assessed the role of audit attributes in sustainability disclosure within Nigeria's oil and gas sector. Employing content and regression

analyses on data spanning 2010 to 2019, they concluded that audit committee size positively influences sustainability disclosure. They propose establishing uniform disclosure standards and improving regulatory communication.

Asaolu *et al*. (2022) investigated how audit committee characteristics impact the sustainable growth of Nigerian firms. Conducting content analysis on 60 manufacturing firms from 2011 to 2020, they found that audit committee size positively correlates with sustainable growth. They recommend forming large, independent, and professional audit committees to enhance sustainability practices.

Aruwa *et al*. (2021) examined the effect of audit committee characteristics on sustainability reporting disclosure in Nigeria. Using panel regression analysis on data from 2010 to 2019, they found that audit committee size significantly improves sustainability reporting. They recommend increasing audit committee size to enhance corporate sustainability disclosures.

Indriawati *et al*. (2022) explored the relationship between corporate governance, company characteristics, and sustainability reporting. Through multiple regression analysis, they found that audit committee size does not significantly influence sustainability reporting. They suggest that other corporate governance factors may play a more crucial role in disclosure practices.

Khoiriyah *et al*. (2022) analyzed the impact of audit committee characteristics on corporate social responsibility disclosures. Applying Ordinary Least Squares (OLS) regression analysis to data from 77 manufacturing firms between 2014 and 2018, they found that audit committee size significantly enhances CSR disclosures. They recommend considering audit committee size when structuring governance frameworks.

Aprianti *et al*. (2021) investigated the relationship between audit committee characteristics and sustainability reporting in the energy sector. Using multiple regression analysis on 47 energy firms in 2020, they found that audit committee size significantly influences sustainability reporting. They suggest strengthening audit committee attributes to improve disclosure quality.

Hasan *et al*. (2021) studied corporate sustainability reporting determinants in Pakistan. Employing logistic regression analysis on 138 firms from 2009 to 2018, they found that companies with larger audit committees are more likely to publish sustainability reports. They recommend that policymakers focus on audit committee attributes to enhance regulatory frameworks.

2.4.2. Audit Committee Diligence and Sustainability Reporting

Ohwo and Audu (2023) examine the influence of audit committee characteristics on sustainability reporting among listed deposit money banks in Nigeria. Their findings indicate that frequent audit committee meetings have a positive impact on sustainability reporting. They recommend increasing the number of independent directors and holding regular meetings to enhance transparency and mitigate risks in corporate sustainability disclosures.

Jubril *et al*. (2022) analyze the effect of audit committee characteristics on environmental sustainability disclosure. Their results show a significant association between audit committee meeting frequency and environmental disclosure. The study suggests implementing mandatory policies requiring listed firms to disclose environmental information.

Khoiriyah *et al*. (2022) assess the role of audit committee characteristics in corporate social responsibility (CSR) disclosures. Their findings indicate that audit committee activism has a minor negative impact on CSR reporting. They propose encouraging regular audit committee meetings to improve CSR disclosure practices.

Aprianti *et al*. (2021) investigate the relationship between audit committee characteristics and sustainability reporting using data from the Indonesia Stock Exchange. Their results highlight that the frequency of audit committee meetings significantly influences sustainability reporting. They recommend increasing the number of meetings to enhance the quality of disclosures.

Aruwa *et al*. (2021) explore the effect of audit committee characteristics on sustainability reporting among Nigerian manufacturing firms from 2010 to 2019. Their study finds that frequent audit committee meetings significantly enhance sustainability disclosure. They advocate for increased financial expertise and more frequent meetings within audit committees to improve corporate sustainability reporting.

Said *et al*. (2020) examine the relationship between audit committee attributes and sustainability disclosure among companies listed on the FTSE4Good Bursa Malaysia Index. Their findings suggest that audit committee diligence positively influences sustainability disclosure. They recommend strengthening independence, gender diversity, and diligence within audit committees to enhance transparency and reporting practices.

Dewi *et al*. (2020) analyze financial factors affecting sustainability reporting disclosure, with audit committee activity as a moderating variable. Their results reveal that audit committee meetings moderate the relationships between liquidity, profitability, and sustainability reporting, but not firm size. The study recommends increasing audit committee activity to improve sustainability disclosures.

Hidayah *et al*. (2019) investigate factors influencing sustainability disclosure among ISRA-listed companies. Their regression analysis indicates that the frequency of audit committee meetings significantly affects sustainability reporting. They suggest that companies with high growth rates and significant leverage should enhance sustainability reporting through more frequent audit committee meetings.

2.4.3. Audit Committee Independence and Sustainability Reporting

Ohidoa and Ojeaga (2023) explore the link between audit committee attributes and sustainability reporting, concluding that audit committee independence has a negative but statistically insignificant effect. They recommend aligning audit committee composition with regulatory requirements and increasing the number of independent directors to enhance effectiveness.

Rozsolova and Dohnalova (2023) investigate the influence of audit committee independence and expertise on ESG performance among publicly listed non-financial firms in Scandinavia from 2012 to 2021. Their findings indicate a significant positive relationship, emphasizing the role of audit committees in improving ESG outcomes.

Ohwo and Audu (2023) examine the effect of audit committee characteristics on sustainability reporting among Nigerian deposit money banks. Their results reveal a positive impact of audit committee independence on sustainability reporting, suggesting that increasing the proportion of independent directors can strengthen sustainability practices.

Meutia *et al*. (2023) assess the relationship between audit committee attributes and sustainability reporting in Indonesian banks. Their study finds a positive correlation between audit committee independence and sustainability disclosures, underscoring the significance of audit committee characteristics in improving reporting quality.

Afolabi *et al*. (2022) analyze audit attributes and sustainability disclosure in Nigerian oil and gas firms from 2010 to 2019. Their findings suggest that

audit committee independence enhances disclosure practices. The study recommends adopting harmonized sustainability standards and increasing the number of independent directors.

Asaolu *et al*. (2022) investigate audit committee characteristics and sustainable growth in Nigerian non-financial firms from 2011 to 2020. Their results indicate a significant positive association, leading to recommendations for larger and more independent audit committees to foster corporate sustainability.

Aprianti *et al*. (2021) assess audit committee characteristics and sustainability reporting among Indonesian listed companies. Their study finds no significant effect of audit committee independence on disclosure practices, but they recommend incorporating more non-executive commissioners to enhance transparency.

Aruwa *et al*. (2021) examine the role of audit committee characteristics in sustainability disclosure within Nigerian manufacturing firms from 2010 to 2019. Their findings indicate that audit committee independence has an insignificant effect, suggesting that its influence in this context may be limited.

Hasan *et al*. (2021) investigate the determinants of corporate sustainability reporting in Pakistan from 2009 to 2018, concluding that audit committee independence negatively impacts sustainability reporting. In contrast, Said *et al*. (2020) find a significant positive relationship between audit committee independence and sustainability disclosure among FTSE4Good Bursa Malaysia Index companies, highlighting the importance of strong governance structures.

Adegboye *et al*. (2020) explore the effect of audit committee characteristics on sustainability disclosure in Nigerian banks from 2014 to 2016, revealing that audit committee independence has a significantly positive influence. Their study emphasizes the role of audit committees in enhancing disclosure practices.

3. METHODOLOGY

3.1. Research Design, Population of the Study, Sampling Technique and Sample Size

This study adopts a longitudinal research design to analyze sustainability reporting practices among environmentally sensitive firms listed on the

Nigeria Exchange Group (NGX) from 2013 to 2022. This timeframe aligns with key regulatory frameworks, including the Nigerian Code of Corporate Governance and the Global Reporting Initiative (GRI-4). The research population comprises 68 listed firms operating across seven environmentally sensitive sectors: agriculture, construction and real estate, consumer goods, healthcare, natural resources, industrial goods, and oil and gas. A stratified sampling technique was used to ensure proportional representation across these sectors. Using Yamane's (1967) formula at a 5% significance level, the required sample size was determined to be 58 firms. However, based on data availability, 46 firms were selected, proportionally distributed across sectors to ensure representativeness.

Table 3.2: Stratified Sample Representation of Environmentally Sensitive Firms

SN	*Sector*	*Sample (n_h)*	*Percentage Representation*
1	Agriculture	5	10.87%
2	Consumer Goods	18	39.13%
3	Industrial Goods	13	28.26%
4	Oil and Gas	10	21.74%
Total	All Sectors	46	100%

Source: Researcher's Compilation

3.5. Source of Data

This study utilises secondary data obtained from the audited financial reports of a sample of 46 firms over the study period. Information on the dependent and independent variables is extracted from directors' reports, corporate governance reports, financial statements, and accompanying notes. Sustainability reporting disclosures are assessed using a checklist aligned with the Global Reporting Initiative (GRI-4) framework, encompassing 91 disclosure items: 9 economic, 34 environmental, and 48 social. The independent variables include audit committee characteristics such as size, diligence, and independence, while control variables consist of firm size, board gender diversity, and leverage.

3.6. Model Specification

The panel data utilised in this study is subjected to appropriate descriptive and inferential statistics. The agency theory is adopted for the model because it explains the relationships between independent and dependent variables where

by the audit committee serve as impetus to reduce information asymmetry of corporate sustainability disclosures (Said *et al*., 2020).

Since the model used by Khoiriyah *et al*. (2022) had various revisions, the model specification for this study is supplied in econometric form as follows:

The Khoiriyah *et al*., (2022) model is described below.

$$CSRDit = \beta0 + \beta1ACSit + \beta2ACFEit + \beta3ACMi + \beta4FSIZEit + \beta5FAGEit + \beta6LISTAGEit + \beta7LEVit + \varepsilon it \quad (1)$$

CSRD : CSR disclosure level Sustainability (un-weighted content analysis)

ACS : number of members of the audit committee

ACFE : percentage of members who have expertise in finance

ACM : number of audit committee meetings

FSIZE : company size (ln total assets)

FAGE : company age since incorporation

LIST AGE : age of listing

LEV : leverage

β0 : constant term or intercept.

β1 - β7: coefficient of the predictor

ε : Error term= unexplained variable

t= time

The a priori expectation is β1- β7 > 0.

However, in order to maintain internal consistency and enable more precise comparisons, the model of Khoiriyah *et al*. (2022) is adapted and modified for this research. The functional form of the model will be:

$$SRDlit = f(ACit) \quad (2)$$

Given the above ACit is defined and measure as follows:

Where Audit committee characteristics (ACit) is (ACSIZit, ACDit)

Therefore:

Sustainability Reporting Disclosure Index

$$SRDlit = f(ACSIZit, ACDit, AClit, LEVit, BSIZEit, FAGEit) \quad (3)$$

It is expressed in mathematical form as:

$$SRDlit = \beta 0 + \beta 1ACSIZit + \beta 2ACDit + \beta 4AClit + \beta 7LEVZit + \beta 8BSIZEit + \beta 9FAGEit + \varepsilon it \quad (4)$$

An unweighted content analysis was used to produce the dependent variable SRDI=Sustainability Reporting Index. The first step is to compare the sample yearly reports to the elements on the checklist. If a suitable explanation could be discovered, a 1 was assigned; otherwise, a 0 was given for the lack of disclosure.

This idea of a dependent variable can be stated mathematically as follows:

$$SRDl = \Sigma t = 1 xij / nj$$

Where nj is the number of items for the jth firm. xij =1 if the ith item is disclosed, 0 if ith item is not disclosed, so that 0≤SRDIj ≤1 index for calculating SRDI, please refer to the Appendix 1 and 2 in the appendixes.

The independent variables is defined as follows:

ε = Error Terms which is the unexplained variable

t = time (2013 -2022)

β0= constant term or intercept.

β1- β9= Regressors

3.7. Operationalization of Variables

Table 3.4: Variable Measurement and Source

Variables	*Definition*	*Type*	*Measurement*	*A priori*	*Source*
SRDI	Sustainability Reporting Disclosures Index	Dependent	Unweighted content Analysis in Appendix 1 and 2 in which dummy 1proxy content availability in annual report and 0 if otherwise	NIL	Ikpor *et al.* (2022), Haladu (2017)
ACSIZ	Audit Committee Size	Independent	Total number of members in the audit committee.	+	Aruwa *et al.* (2021)
ACD	Audit Committee Diligence	Independent	Total number of meetings held during the reporting period.	+	Adegboye *et al.* (2020)
ACI	Audit Committee Independence	Independent	Proportion of non-executive directors in the audit committee.	+	Aruwa *et al.* (2021)
LEV	Leverage	Control	Ratio of total debt to total assets.	+	Ohidoa and Ojeaga (2019)

Variables	*Definition*	*Type*	*Measurement*	*A priori*	*Source*
BSIZE	Board SIZE	Control	Total number of directors on the board.	+	Samuel (2020)
FAGE	Firm Age	Control	Number of years since the firm's establishment until the study period.	+	Handoyo *et al.* (2023)

Source: Researcher's compilation (2024)

3.8. Method of Data Analysis

This study utilises panel regression analysis, determining the appropriate model fixed or random effects through the Hausman test. The pooled model is assessed against the fixed effects model using the F-test and compared to the random effects model via the Breusch-Pagan LM test. Diagnostic tests are conducted to check for serial correlation and heteroskedasticity, with the panel generalised least squares (GLS) estimator applied to address these concerns. A panel unit root test is performed to confirm data stationarity. Statistical analysis is carried out using E-Views 10 software to enhance the accuracy of predictions regarding the influence of audit committee characteristics on sustainability reporting disclosure among listed environmentally sensitive firms in Nigeria.

4.1. Data Analyses and Interpretation

4.1.1 Descriptive statistics

The estimates in Table 4.1 are the descriptive statistics components.

Table 4.1: Descriptive Statistics

	SRDI	*ACSIZ*	*ACD*	*ACI*	*LEV*	*BSIZE*	*FAGE*
Mean	0.399	6	3.8457	0.4781	0.6287	9.504	38.287
Median	0.4857	6	4	0.5	0.5966	9	38
Maximum	0.9115	9	7	0.6667	2.4785	18	99
Minimum	0	3	1	0.1667	0.0323	4	1
Std. Dev.	0.2287	1.0252	0.7755	0.0732	0.3129	3.066	19.09
Skewness	-0.773	-0.222	-0.316	-1.078	2.0945	0.601	0.3983
Kurtosis	2.6341	3.3004	5.5153	5.5634	10.616	2.865	3.2511
Jarque-Bera	48.37	5.5086	128.9	215.1	1448	28.08	13.374
Probability	0.000	0.0637	0.000	0.000	0.000	0.000	0.0012
Sum	183.53	2576	1769	219.92	289.19	4372	17612
Sum Sq. Dev.	23.998	482.4	276.04	2.4611	44.937	4315	167280
Observations	460	460	460	460	460	460	460

Source: Researchers' Compilation (2024)

The study finds that sustainability reporting disclosure (SRDI) among listed environmentally sensitive firms in Nigeria averages 40%, indicating low compliance with GRI-4 standards. The distribution is platykurtic (kurtosis: 2.6341) with moderate symmetry (-0.773 skewness).

Audit committee size (ACSIZ) has a mean and median of 6 members, aligning with FRCN (2018) but exceeding CAMA (2020). The distribution trends toward leptokurtic (kurtosis: 3.3004), with a near-normal fit (Jarque-Bera: 5.5086) and slight negative skewness (-0.222).

Audit committee diligence (ACD) averages 3.85 meetings annually, meeting regulatory requirements. The distribution is leptokurtic (kurtosis: 5.5634) with moderate symmetry (-0.316 skewness).

Audit committee independence (ACI) has a mean of 47.81%, below CAMA's 60% threshold. The data is highly skewed (-1.078) with a long-tailed leptokurtic distribution (kurtosis: 5.5153), indicating significant variability in independence levels.

4.2.1. Correlation Matrix

Table 4.2: Correlation Matrix

	SRDI	ACSIZ	ACD	ACI	LEV	BSIZE	FAGE
SRDI	1.000						
ACSIZ	0.0212	1.000					
ACD	-0.098	0.1852	1.000				
ACI	0.0836	0.129	0.0328	1.000			
LEV	0.0801	0.009	-0.11	-0.057	1.000		
BSIZE	0.0261	-0.23	-0.154	-0.051	0.0865	1.000	
FAGE	-0.106	0.202	0.0975	-0.066	0.057	-0.179	1.000

Source: Researchers' Compilation (2024)

Table 4.2 presents the interdependence among variables. Each variable's correlation coefficient with itself is 1.000, indicating the absence of multicollinearity, meaning no independent variable predicts another independent variable. The relationship between the exogenous variables and the endogenous variable (SRDI) is as follows: audit committee size and audit committee independence exhibit positive associations with corporate sustainability disclosures among listed environmentally sensitive firms in Nigeria, with correlation coefficients of 0.0212 and 0.0836, respectively.

However, audit committee diligence shows a negative association, with a coefficient of -0.098.

4.3. Inferential Statistics

4.3.1. Panel Unit Root Tests

The study employs both the Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) unit root tests to ensure consistency in panel unit root results. These tests confirm stationarity before proceeding with static panel data estimation, preventing spurious results and ensuring valid parameter estimation (Blundell & Bond, 1998). Stationarity is accepted if the p-value is below 0.05, rejecting the null hypothesis of a unit root.

Table 4.3: Estimates of Philips-Perron and Augmented Dickson Fuller unit root test

Variables	*Philips-Perron P-P*		*Augmented Dickson Fuller ADF*	
	Prob	*Order of Intergration*	*Prob*	*Order of Intergration*
SRDI	0.0000	I(0)	0.0000	I(0)
ACSIZ	0.0000	I(0)	0.0000	I(0)
ACD	0.0000	I(0)	0.0000	I(0)
ACI	0.0000	I(0)	0.0000	I(0)
LEV	0.0000	I(0)	0.0000	I(0)
BSIZE	0.0000	I(0)	0.0000	I(0)
FAGE	0.0000	I(0)	0.0006	I(0)

Source: Researchers' Compilation (2024)

Table 4.3 presents the results of the Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) panel unit root tests, confirming that all variables are stationary at level I(0). This ensures their appropriateness for panel model estimation and minimizes the likelihood of spurious regression outcomes, allowing the analysis to proceed reliably.

4.3.2 Effect of audit committee characteristics on sustainability reporting

This section analyzes the impact of audit committee characteristics on corporate sustainability reporting among listed environmentally sensitive firms in Nigeria.

The study utilizes pooled, static, and generalized least squares (GLS) panel regression models, considering factors such as audit committee size, diligence, gender diversity, financial expertise, and multiple directorships. Additionally, control variables including leverage, board size, and firm age are incorporated into the analysis.

The static panel analysis includes pooled, random, and fixed-effects models, with the Breusch-Pagan LM test and Hausman test guiding model selection. The pooled model averages individual effects, while the F-test evaluates whether fixed effects are significant enough to justify its use over the pooled OLS

Table 4.4: Estimates of Fixed Effect Test

Redundant Fixed Effects Tests			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	139.388735	-45,405	0.0000
Cross-section Chi-square	1289.200985	45	0.0000

Source: Researchers' Compilation (2024)

The fixed effect test results indicate a significant impact, as evidenced by a cross-section F-test p-value of 0.0000 ($p < 0.05$), suggesting that the fixed effect model is more suitable than the pooled model. To further confirm the appropriate model choice, the Hausman test is conducted to compare the fixed and random effect models.

4.3.2.3. Random Effect Test

The Breusch-Pagan LM, Pesaran scaled LM, and Pesaran CD tests evaluate whether individual-specific variance components are zero. If the test statistic is less than 0.05, the random-effects model is deemed more suitable than the pooled model.

Table 4.5: Estimates of Cross-sectional Dependence Test

Residual Cross-Section Dependence Test			
Test	*Statistic*	*d.f.*	*Prob.*
Breusch-Pagan LM	2718.034	1035	0.0000
Pesaran scaled LM	36.992		0.0000
Pesaran CD	7.476893		0.0000

Source: Researchers' Compilation (2024)

The Breusch-Pagan LM, Pesaran scaled LM, and Pesaran CD test results of 0.0000, 0.000, and 0.0000, respectively, are below the 5% significance level. This indicates that the random-effects model provides a more reliable estimate than the pooled model.

4.3.2.5. Hausman test for fixed or random effect model

The study determines the suitable model using the Hausman test, which evaluates fixed versus random effects. A p-value above 0.05 favors the random-effects model, while a lower p-value supports the fixed-effects model. The fixed-effects approach assumes independent variables directly influence the dependent variable, whereas the random-effects model presumes no correlation between errors and regressors, with errors randomly distributed across the sample.

Table 4.6: Hausman correlated random effect test

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	*Chi-Sq. Statistic*	*Chi-Sq. d.f.*	*Prob.*
Cross-section random	21.10172	9	0.0122

Source: Researcher's computation (2024)

Table 4.6 confirms that the fixed-effects model is the most suitable, as the Hausman test p-value (0.0122) is below the 0.05 threshold. Table 4.7 provides panel regression estimates for pooled, random, and fixed effects. Following diagnostic tests, the panel generalized least squares (GLS) method is applied.

Table: 4.7 Panel Data Regression Results of the Impact of Audit Committee Characteristics on Corporate Sustainability Disclosures

	Model 1 Pooled OLS		*Model 2 Random Effect*		*Model 3 Fixed Effect*	
Variable	*Coefficient*	*Prob.*	*Coefficient*	*Prob.*	*Coefficient*	*Prob.*
C	0.508629	0.0000	0.174553	0.007	0.114495	0.0536
ACSIZ	-0.003698	0.7412	-0.003276	0.4346	-0.003445	0.4139
ACD	-0.008646	0.5457	0.004618	0.3628	0.006286	0.219
ACI	0.244161	0.0858	0.106047	0.0142	0.116694	0.0073
ACGD	-0.281935	0.0000	0.034176	0.1729	0.038166	0.1312
ACFE	-0.365266	0.0024	-0.008017	0.8697	-0.029723	0.5524
ACMD	-0.028036	0.6319	0.053115	0.1174	0.048255	0.165
LEV	0.007254	0.1623	0.003063	0.4703	0.002033	0.6434
BSIZE	0.000706	0.8415	0.00265	0.1809	0.003094	0.1244
FAGE	-0.001072	0.0560	0.003441	0.0000	0.004785	0.000
Observations	460		460		460	

	Model 1 Pooled OLS		*Model 2 Random Effect*		*Model 3 Fixed Effect*	
R-squared	0.101368		0.065222		0.945497	
Adjusted R-squared	0.083396		0.046526		0.93823	
Log likelihood	51.11596		3.488622		695.7165	
Prob(F-statistic)	0.0000		0.000349		0.0000	
Durbin-Watson stat	0.322097		0.772309		0.890249	
The P-values are significant at 5%						

Source: Researcher's computation (2024)

4.3.2.6. Diagnostic Tests

Panel data often violate OLS assumptions of homoscedasticity and correlation. Therefore, tests for homoscedasticity, cross-sectional correlation, and serial correlation are necessary to ensure reliable results and avoid spurious findings (Podestà, 2002).

4.3.2.7. Testing for Heteroscedasticity

Table 4.8: Estimates of Wald Test Heteroskedasticity Test

Wald Test:			
Test Statistic	Value	df	Probability
F-statistic	8.650038	(2, 405)	0.0002
Chi-square	17.30008	2	0.0002
Source: Researcher's computation (2024)			

The modified Wald test detects heteroscedasticity in the fixed-effect model. A p-value of 0.0002 rejects the null hypothesis, indicating heteroscedasticity and unreliable OLS estimates.

4.3.2.8 Testing for cross-sectional dependence test

Failing to account for cross-sectional dependence can reduce estimation efficiency. The Breusch-Pagan LM test (p-value = 0.000) confirms its presence, indicating that pooled estimates may be unreliable.

4.3.2.9 Testing for autocorrelation within units

Serial correlation in panel data models can distort standard errors, affecting estimation efficiency. The Durbin-Watson test produces a value of 0.890249,

which falls outside the acceptable range of 1.50 to 2.50, indicating the presence of autocorrelation. Furthermore, the Breusch-Godfrey LM test (p-value = 0.0000) confirms autocorrelation within the panel data model.

4.3.2.10. Multicollinearity test

The Variance Inflation Factor (VIF) is used to evaluate multicollinearity among independent variables. A VIF value of 1 signifies no correlation, values between 1 and 5 indicate moderate correlation, and values exceeding 5 suggest a high degree of multicollinearity (Brooks, 2019). The VIF results presented in Table 4.9 offer insights into the correlation levels among the explanatory variables.

Table 4.9: Variance Inflator Factor Estimates

Variance Inflation Factors			
Variable	*Coefficient Variance*	*Uncentered VIF*	*Centered VIF*
C	0.0132	126.285	NA
ACSIZ	0.0001	38.9468	1.2603
ACD	0.0002	30.207	1.1779
ACI	0.0201	45.1514	1.0327
LEV	0.0000	1.2894	1.0800
BSIZE	0.0000	11.9007	1.1195
FAGE	0.0000	5.4963	1.0925

Source: Researcher's Computation (2024)

The centered variance inflation factor (VIF) result for each of the variables are as follows: Audit Committee Size (ACSIZ)=1.2603< 5, Audit Committee Diligence (ACD) =1.1779< 5, Audit Committee Independence (ACI)=1.045 < 5, Leverage (LEV)=1.1488<5, Board Size (BSIZE)=1.0800<5, Firm Age (FAGE)= 1.1195<5 and Firm Age (FAGE)= 1.0925<5. Since all the are less five, this indicate that multicollinearity problem does not exist among the variables.

4.3.2.11. Choice of estimator and justification

The error structure in the study model reveals panel heteroscedasticity, autocorrelation, and cross-sectional correlation (HPAC), which must be addressed for valid results. Cameron & Trivedi (2013) and Moundigbaye *et al.* (2018) recommend alternative estimators, particularly for fixed-effects models prone to these issues. Ignoring non-spherical errors can lead to inefficiencies

and biases (Reed & Ye, 2011). To correct this, the Generalised Least Squares (GLS) estimator, proposed by Aitken (1935), is employed. GLS efficiently handles heteroscedasticity, serial correlation, and cross-sectional dependence, making it the preferred method for robust statistical inference (Moundigbaye *et al.*, 2018; Chen *et al.*, 2011).

4.4. Panel regression analysis using alternative panel data estimators

The Generalized regression model estimates and the fixed-effect panel model are given in Table 4.10 below.

Table 4.10: Fixed effect and GLS models: Regression results of the impact of audit committee characteristics on corporate sustainability disclosures of listed environmentally sensitive companies in Nigeria

Dependent variable: SRDI	*Model 3 Fixed Effect*		*Model 4 GLS*	
Variable	*Coefficient*	*Prob.*	*Coefficient*	*Prob.*
C	0.114495	0.0536	0.202275	0.0000
ACSIZ	-0.003445	0.4139	-0.002537	0.0064
ACD	0.006286	0.219	0.004126	0.0001
ACI	0.116694	0.0073	0.050136	0.0000
LEV	0.002033	0.6434	0.000605	0.481
BSIZE	0.003094	0.1244	0.001565	0.0009
FAGE	0.004785	0.0000	0.004121	0.0000
Observations	460		460	
R-squared	0.945497		0.997835	
Adjusted R-squared	0.93823		0.997546	
Log likelihood	695.7165		0.0000	
Prob(F-statistic)	0.0000		0.0000	
Durbin-Watson stat	0.890249		0.84181	

Where: SRDI= Sustainability Reporting Disclosures; ACSIZ= Audit Committee Size; ACD= Audit Committee Diligence; ACI= Audit Committee Independence; LEV=Leverage; BSIZE= Board Size and FAGE= Firm Age.
Source: Researcher's computation (2024)

4.4.1. Discussion of results

The study compared the panel Generalized Least Squares (GLS) model with the fixed-effects model to determine the best estimator. The GLS model showed a higher R-squared (0.9978) and adjusted R-squared (99.75%) compared to the fixed-effects model (0.9455 and 93.82%, respectively), indicating improved explanatory power. GLS also resolved heteroscedasticity, serial correlation, and

cross-sectional dependence. Additionally, GLS identified five significant audit committee characteristics at a 5% significance level, whereas the fixed-effects model identified only one. Hypotheses were tested using the GLS model, rejecting the null when the p-value was below 0.05.

4.4.1.1. Test of hypotheses

Hypothesis 1: Audit committee size and corporate sustainability reporting: Table 4.10 reveals a significant negative relationship between audit committee size and corporate sustainability reporting among listed environmentally sensitive firms in Nigeria (coefficient = -0.002537, p = 0.0064). Since the p-value is below 0.05, the null hypothesis is rejected, supporting the alternative hypothesis that audit committee size influences sustainability reporting. The negative coefficient suggests that as audit committee size increases, disclosure levels tend to decrease.

Hypothesis 2: Audit committee diligence and corporate sustainability reporting: The results in Table 4.10 indicate that audit committee diligence positively and significantly affects corporate sustainability disclosures among listed environmentally sensitive firms in Nigeria (coefficient = 0.0041266, p = 0.0001). With the p-value below 0.05, the null hypothesis is rejected, confirming that audit committee diligence enhances sustainability disclosures. This implies that a higher frequency of audit committee meetings improves corporate transparency and disclosure practices.

Hypothesis 3: Audit committee independence and corporate sustainability reporting: The findings demonstrate that audit committee independence has a significant positive effect on corporate sustainability reporting (coefficient = 0.050136, p = 0.0000). As the p-value is below 0.05, the null hypothesis is rejected, indicating that increased audit committee independence enhances sustainability disclosures. A one-unit increase in audit committee independence is associated with a 0.05 unit rise in sustainability reporting levels.

4.4.2. Discussion of Findings

4.4.2.1 Audit committee size and corporate sustainability disclosures

The study reveals a significant negative relationship between audit committee size and corporate sustainability disclosures among listed environmentally sensitive firms in Nigeria. This aligns with the findings of Ohidoa and Ojeaga (2023)

but contrasts with Meutia *et al.* (2023), Afolabi *et al.* (2022) and Wahome *et al.* (2025), who reported a positive association. Indriawati *et al.* (2022) found no significant effect. The negative relationship suggests that smaller audit committees may provide more effective oversight, ensuring better compliance with sustainability reporting frameworks, in line with agency theory.

4.4.2.2 Audit committee diligence and corporate sustainability disclosures

Audit committee diligence exhibits a significant positive effect on corporate sustainability disclosures, consistent with the findings of Said *et al.* (2020), Aruwa *et al.* (2021), and Ohwo and Audu (2023). However, Khoiriyah *et al.* (2022) reported an inverse relationship. The results indicate that frequent audit committee meetings enhance oversight, leading to improved sustainability reporting, supporting the principles of agency theory.

4.4.2.3. Audit committee independence and corporate sustainability disclosures

The study finds that audit committee independence significantly enhances corporate sustainability disclosures, corroborating the results of Afolabi *et al.* (2022), Ohwo and Audu (2023), Meutia *et al.* (2023), and Rozsolova and Dohnalova (2023). Conversely, Aruwa *et al.* (2021) and Ohidoa and Ojeaga (2023) found no significant effect. These findings align with agency, legitimacy, and stakeholder theories, emphasising that a more independent audit committee fosters greater transparency and improved sustainability reporting.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study examines the effect of audit committee characteristics size, diligence, and independence on corporate sustainability disclosures (CSD) among environmentally sensitive firms in Nigeria. Covering the period from 2013 to 2022, data from 46 firms were analysed using the GRI-4 framework, assessing economic, environmental, and social disclosures.

Diagnostic tests, including correlation analysis, variance inflation factor (VIF), and heteroskedasticity checks, ensured data reliability. Panel data estimators were evaluated, with the generalised least squares (GLS) model chosen to address heteroskedasticity and serial correlation. Findings reveal that larger audit committees negatively impact CSD due to coordination inefficiencies,

while diligence and independence enhance sustainability reporting.

These results highlight the complexity of governance dynamics, stressing the need for a balanced composition of audit committees to optimize their contributions to sustainability disclosures. The findings of this study underscore the pivotal role of audit committee characteristics in influencing the transparency and accountability of sustainability reporting practices among environmentally sensitive firms in Nigeria. Specifically, the structural attributes of the audit committee of size, diligence, and independence emerge as critical determinants of the scope and depth of corporate sustainability disclosures. These results carry significant implications for various stakeholders.

Regulatory authorities such as the Financial Reporting Council of Nigeria and the Nigerian Exchange Group are encouraged to enhance existing policies by mandating more rigorous sustainability oversight responsibilities within the audit committee framework. These enhancements would align corporate governance practices with evolving global expectations on environmental accountability. Corporate boards and executive management should prioritise the strategic selection and empowerment of audit committee members who demonstrate independence, possess relevant expertise, and exhibit a strong commitment to sustainability governance. Such intentional structuring of audit committees is essential for fostering a culture of transparency and responsible environmental reporting within firms.

Institutional investors and other capital market participants may also benefit from incorporating audit committee characteristics as a proxy for assessing a firm's environmental accountability and long-term value orientation.

Moreover, the study provides a foundation for scholars and future researchers to extend inquiry into the nexus between corporate governance mechanisms and sustainability reporting, particularly within emerging market contexts where regulatory frameworks and enforcement mechanisms may be evolving. By advancing knowledge in this domain, the study contributes to the broader discourse on sustainable corporate practices and the role of governance in achieving environmental accountability.

5.2. Recommendations

(i) Corporate entities, particularly environmentally sensitive firms, should increase the proportion of independent and non-executive directors on

audit committees. Greater independence will improve decision-making, enhance transparency, and strengthen accountability in sustainability disclosures. Independent audit committee members can provide objective oversight, ensuring that sustainability reporting aligns with regulatory requirements and stakeholder expectations.

(ii) Firms should maintain an optimal audit committee size to avoid coordination inefficiencies that may hinder effective oversight. A well-structured and appropriately sized committee will enhance monitoring and improve the quality of sustainability reporting. Large committees may struggle with decision-making, while overly small committees may lack the necessary expertise. Therefore, firms should strike a balance that ensures effectiveness without compromising efficiency.

(iii) Organisations should ensure that audit committees meet regularly and actively engage in sustainability-related matters. Increased diligence will enhance monitoring functions and improve the credibility of sustainability disclosures. Frequent and proactive engagement in sustainability discussions will enable audit committees to identify risks, ensure compliance, and enhance corporate accountability.

(iv) Policymakers should mandate sustainability reporting and establish harmonised disclosure standards that reflect both international and local requirements. Clear regulations will help audit committees play a more effective role in overseeing sustainability disclosures. A standardised framework will ensure consistency in reporting, making it easier for stakeholders to assess corporate sustainability performance.

(v) Companies should establish dedicated sustainability committees, with audit committees overseeing their operations. These committees should ensure compliance with sustainability frameworks, such as GRI-4, and enhance corporate transparency. By implementing these recommendations, firms can strengthen corporate governance, improve sustainability disclosures, and build greater stakeholder trust.

5.3. Direction for Future Research

Future research should consider expanding the scope of analysis beyond environmentally sensitive firms to include a broader range of industries, thereby allowing for comparative insights across sectors. Additionally, longitudinal

studies could incorporate other dimensions of corporate governance such as board diversity, ownership structure, and the role of external auditors to further examine their interaction with sustainability reporting. Employing qualitative methods, such as interviews with audit committee members or sustainability officers, may also yield deeper insights into the internal governance dynamics influencing disclosure practices. Finally, cross-country comparative studies involving other emerging markets could help to contextualise these findings within a broader international framework.

5.4. Limitations of Study

This study is limited to listed environmentally sensitive firms in Nigeria, which may affect the generalisability of the findings. It relies solely on secondary data, potentially overlooking internal governance dynamics. The exclusive use of quantitative methods restricts deeper insights into audit committee behaviour, and there may be issues of endogeneity and omitted variables. These limitations suggest the need for broader, mixed-method studies in future research.

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Conflict of Interest

There is no conflict of interest involved in the publication of this paper.

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