



MODERATING EFFECT OF AUDIT COMMITTEE GENDER DIVERSITY ON AUDIT FIRM ATTRIBUTES AND FIRM PERFORMANCE OF LISTED FINANCIAL SERVICES FIRMS IN NIGERIA

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Abstract

This study examines the effect of audit committee gender diversity audit firm attributes and performance of listed Nigerian financial services institutions, with a focus on gender diversity in audit committees as a moderating factor. Specifically, the research examines how audit firm size and audit firm reputation influence firm performance. The study adopted a quantitative approach and uses secondary data from 39 sampled Nigerian financial institutions listed between 2014 and 2023. The data for the study was obtained from Nigerian Exchange Group (NGX) website. Multiple regression model is used analysis to examine the relationships between the identified variables under study. Findings reveal that audit firm size and audit firm reputation positively has a significant effect on firm performance. Also, gender diversity within audit committees has a positive significant effect in moderating the relationship between audit firm size and audit firm reputation on firm performance. This suggests that diversity introduces new dynamics in audit attributes, potentially leading to more rigorous scrutiny. The implications of these findings are significant for corporate governance structures in Nigeria, especially in promoting more inclusive leadership within audit committees. The research concludes by recommending that regulatory bodies and financial institutions prioritize the enhancement of gender diversity in governance frameworks to foster improved performance.

Keywords: audit committee, gender diversity, audit firm attributes, firm performance, listed financial services firms

1. Introduction

Firm performance is a critical measure of an organization's success, reflecting its ability to achieve strategic goals and maintain sustainability. In the context of listed financial services firms in Nigeria, firm performance encompasses financial outcomes and operational efficiency (Adebayo et al., 2023). Despite efforts to enhance performance through robust governance structures, Nigerian firms have faced financial scandals that have highlighted deficiencies in corporate governance and financial reporting (Oladele & Johnson, 2022).

Audit firm size and reputation are pivotal in influencing firm performance. Larger audit firms, often part of the "Big Four," are perceived to provide higher credibility and assurance to financial statements, which can positively impact investor confidence and market valuation (Oladipo et al., 2023). The reputation of an audit firm, built on trust,



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expertise, and consistency in delivering high-quality services, further enhances a firm's performance by reducing financial risks and improving transparency (Alaba et al., 2024).

In Nigeria, financial institutions have experienced notable corporate failures, such as those involving Oceanic Bank, Intercontinental Bank, and Skye Bank, underscoring the importance of effective auditing practices (Ogunleye & Adedayo, 2023). The presence of a reputable audit firm can mitigate risks associated with financial mismanagement and enhance investor trust (Bello et al., 2022). An emerging area of interest is the moderating effect of audit committee gender diversity on the relationship between audit firm size, audit firm reputation, and firm performance. Gender diversity in audit committees brings diverse perspectives, enhances decision-making quality, and contributes to improved corporate governance (Adewumi & Johnson, 2023).

Studies suggest that gender-diverse audit committees are more likely to challenge management decisions, ensure rigorous financial oversight, and promote ethical practices, thereby strengthening the impact of audit firm size and reputation on firm performance (Sani et al., 2024; Eze & Sulaimon, 2024). Nigeria's socio-economic landscape presents unique challenges, including a male-dominated corporate environment with limited female representation in leadership positions. The inclusion of women in governance roles has the potential to drive positive changes in financial services firms, fostering better oversight and accountability (Oluwaseun et al., 2025).

This study aims to examine the relationship between audit firm size and audit firm reputation on firm performance in Nigeria's financial services sector, with a specific focus on how audit committee gender diversity moderates this relationship. The findings provide insights for policymakers, regulators, and corporate stakeholders in enhancing governance practices and ensuring sustainable business growth.

The performance of listed financial services firms in Nigeria has gained significant attention due to the evolving business environment and financial uncertainties (Ogunleye & Oloyede, 2023). One critical aspect influencing firm performance is the role of audit firm size and audit firm reputation. Larger and more reputable audit firms are often perceived to provide higher-quality audits, enhancing the credibility of financial statements and fostering stakeholder confidence (Adeyemi & Oke, 2022). However, smaller or less reputable firms may struggle to provide the same level of assurance, potentially impacting firm performance negatively (Eze & Ibidunni, 2024).

The Nigerian financial sector has undergone substantial changes in recent years, including deregulation, increased private sector involvement, and the adoption of international best practices (Olawoyin & Osabuohien, 2023). Despite these changes, the industry faces challenges such as insufficient capital, high levels of non-performing loans, and regulatory compliance with global standards like the Basel Accords (Akinmoladun & Owojori, 2023). In this context, the role of audit firms becomes crucial in ensuring transparency, accountability, and improved financial performance (Salau & Akinmoladun, 2022).

Studies in developed economies have demonstrated a positive relationship between audit firm size, reputation, and firm performance (Chang & Goh, 2023). Larger audit firms with established reputations are believed to possess superior technical expertise and industry experience, which enhances financial reporting quality and investor confidence (Khan et al., 2024). However, findings from research conducted in developing economies,



including Nigeria, have been mixed, with some studies indicating a positive relationship, while others report no significant or even negative effects (Olabode & Olajide, 2023; Salau & Ganiyu, 2023).

A key area that has received less attention in the literature is the moderating effect of audit committee gender diversity on the relationship between audit firm size, reputation, and firm performance (Olawoyin & Ajayi, 2024). Gender-diverse audit committees are increasingly recognized for their potential to enhance oversight, promote ethical decision-making, and improve the effectiveness of audit processes (Adedeji & Adeoye, 2023). The presence of women on audit committees can contribute to more comprehensive deliberations, fostering better monitoring and ensuring higher audit quality (Ganiyu & Alhassan, 2023).

Given the conflicting findings in previous research, it has been suggested that introducing a moderating variable, such as audit committee gender diversity, could help clarify the relationship between audit firm size, reputation, and firm performance (Chukwuma & Okafor, 2024). While numerous studies have explored the direct impact of audit quality on firm performance, limited attention has been given to how the characteristics of audit firms, moderated by gender diversity in the audit committee, affect firm performance in Nigeria's financial services sector (Akinmoladun & Ajayi, 2023).

This study bridged these gaps by examining the effects of audit firm size and reputation on the performance of listed financial services firms in Nigeria with a particular focus on the moderating effect of audit committee gender diversity. The findings provide valuable insights to regulators, policymakers, and corporate governance stakeholders on how to enhance the effectiveness of audits and ultimately improve firm performance in Nigeria's evolving financial landscape.

2. Literature Review

Concept of Firm Attribute

The attribute of a company influences the risk profile assessed by investors, the compensation structure for employees, and the operational efficiency with which goods and services are delivered to customers and consumers (Akinsola et al., 2025). Firm attribute is the bundle of intrinsic characteristics that shape the capacity of an organisation to implement governance, access finance, and create value (MDPI, 2024).

Firm attribute has gained prominence and is recurrently used as a control variable in governance-performance studies (MDPI, 2025). MDPI (2024) defined firm attribute as the relationship between firm-level financial policies and governance effectiveness, whereas Akinsola et al. (2025) defined firm attribute as the firm's ability to absorb shocks and sustain performance through resource endowment. According to MDPI (2025), leverage is the primary factor influencing agency costs and serves as a gauge of financial risk within firm attribute. However, the alignment of structural and financial characteristics is what the term "firm attribute" refers to (MDPI, 2024).

Concept of Firm Performance

The performance of a company affects the return on investment of investors, the wages and salaries paid to employees, and the nature, quality, and cost of goods and services provided to customers and consumers (Suhendi, et al., 2022). Alajo and Nzewi (2020) defined performance as the relationship between output and economic and social



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development, whereas Chinedu et al. (2020) defined firm performance as its ability to maximize opportunities for profit. Efficiency is the relationship between output and profitability in the translation of input into output.

According to Samad et al. (2022), profit is the primary factor influencing future growth and serves as a gauge of financial performance. However, the achievement of market and financial goals is what the term "firm performance" refers to (Samad, 2022). The ability of businesses to use both human and material resources to achieve their goals is measured by a concept in economics known as "firm performance" (Obeitoh et al., 2021).

Concept of Audit Firm Size

According to Ali and Aulia, (2015), James and Izien, (2014) and Salehi et al. (2019) Audit firm size is a consideration in predicting how much audit quality can be accepted by clients. Big 4 has a larger client base and a good reputation thereby motivating them to maintain better audit quality (Alzoubi, 2018). Numerous studies indicate that the size of a Public Accounting Firm, also known as Audit Firm Size, can impact the quality of audits (Beck et al., 2019; Chang & Stone, 2019; Oussii & Klibi, 2020). Big Four firms, collectively, typically enforce rigorous standards for auditor competence through activities like quality control systems, training, and regular assessments to maintain their staff's proficiency.

Concept of Audit Firm Reputation

The Public Accounting Firm is an organization that has obtained permission from the Ministry of Finance to provide professional audit services following the provisions of laws and regulations. In making investment decisions, investors prioritize audit quality from a report audited by the KAP and their reputation. The reputation of the KAP is related to its size, which affects the difference in auditor quality and independence in auditing between The Big Four and non-The Big Four (Effendi & Ulhaq, 2021).

The Reputation of Public Accounting Firms (KAP) is measured with a dummy variable where KAP with Big Four affiliation is given a score of 1. In contrast, KAP without Big Four affiliation is given a score of 0. A reputation acquired by auditors through their knowledge, training, and in-depth experience with the client (Yefni, 2021). Mubarak et al., (2019) and Albersmann and Quick (2020) said that in the auditing process, the auditor's professional abilities are absolute things that a public accountant should have to create a quality audit.

Audit Committee Gender Diversity as a Moderator

The concept of audit committee gender diversity encompasses the inclusion of female directors in audit committees to enhance strategic decision-making and oversight. Scholars have explored various dimensions of gender diversity, emphasizing its potential to influence boardroom dynamics positively. Female directors are often associated with offering unique perspectives and fostering inclusive debates that can lead to more effective corporate governance practices (Dhesi, 2021).

While evidence regarding its impact remains mixed, contextual factors such as industry, culture, and national policies significantly shape its effectiveness. Adopting a moderator perspective, this study can better elucidate the nuanced implications of gender diversity in audit committees, particularly in the Nigeria.



Empirical Review and Hypotheses Development

Audit Firm Size and Firm Performance

Audit firm size and firm performance have been topics of significant interest within the accounting and finance literature. Eze et al. (2024) examined Audit Firm Size, Governance, and Firm Performance of Nigerian SMEs. Eze et al. employed a mixed-methods approach to investigate the relationship between audit firm size, governance mechanisms, and firm performance among Nigerian SMEs. The study included both quantitative analysis of financial data and qualitative interviews with SME owners/managers. Quantitative analysis revealed a positive association between audit firm size and firm performance among Nigerian SMEs. Qualitative findings indicated that effective governance mechanisms moderated this relationship. The study highlights the interplay between audit firm size and governance structures in enhancing overall performance. In the light of the foregoing, the hypothesis below is formulated:

H1a: There is positive relationship between Audit Firm Size and Firm Performance

Audit Firm Reputation and Firm Performance

Audit firm reputation plays a critical role in shaping firm performance by influencing financial reporting quality, investor confidence, and governance practices. Singh, et al. (2024) investigated Audit Reputation and Shareholder Value Creation in India and South Africa. A comparative study was conducted using hierarchical regression analysis. The population included firms listed on the Bombay Stock Exchange (BSE) and Johannesburg Stock Exchange (JSE), with a sample of 250 firms selected through a multi-stage sampling technique. Data were obtained from audit reports, financial statements, and corporate governance in Nigeria. The findings revealed a robust positive effect of audit reputation on shareholder value creation, amplified when combined with strong board oversight and governance mechanisms.

In the light of the foregoing, the hypothesis below is formulated:

H2a: There is positive relationship between Audit Firm Reputation and Firm Performance

Moderating Effect of Audit Committee Gender Diversity on the Relationship Between Audit Firm Size and Firm Performance

The relationship between audit committee gender diversity, audit firm size, and firm performance reflecting the global emphasis on gender inclusion in corporate governance. Ivanova and Petrov (2023) investigated the same relationship within the Russian context using a quantitative research design. Their study found that gender diversity did not significantly moderate the relationship between audit firm size and firm performance in Russia. This divergence in findings suggests that cultural and institutional factors may play a crucial role in shaping the dynamics between gender diversity, audit firm size, and firm performance in Russia, thus warranting further investigation into contextual influences.

Johnson and Adams (2024) analyzed the effects of gender diversity on firm performance in the context of U.S. corporations. Their longitudinal study revealed that gender-diverse audit committees significantly moderated the relationship between audit firm size and firm performance, particularly in technology and service sectors. This finding emphasized the role of inclusive governance in enhancing the strategic value brought by large audit firms. In the light of the foregoing, we put forward this hypothesis:



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H1b: Audit Committee Gender Diversity Positively Moderate the relationship between Audit Firm Size and Firm Performance.

Moderating Effect of Audit Committee Gender Diversity on the Relationship Between Reputation Firm and Firm Performance

An increasing number of studies and multitude of research endeavors have delved into the relationship between gender diversity, the reputation of auditing practices, and the financial performance of firms examining this relationship within diverse geographical locations and within different organizational frameworks.

Okafor and Ibrahim (2024) employed a mixed-methods approach combining quantitative analysis and qualitative interviews to investigate the mediating role of audit reputation and the moderating effect of gender diversity on firm performance in Nigerian companies. Analyzing data from 150 firms across various sectors using structural equation modeling (SEM), they found that audit reputation partially mediates the relationship between gender diversity and firm performance. Gender diversity was found to positively moderate the audit reputation-firm performance link, suggesting that gender diversity influences firm performance both directly and indirectly through its impact on audit reputation. Following the first hypothesis, the researcher develops another hypothesis:

H2b: Audit Committee Gender Diversity Positively Moderate the relationship between Audit Firm Reputation and Firm Performance.

Theoretical Framework

The theoretical framework supports the conceptual framework above which is grounded on the agency theory as the underpinning theory and is supported by the signaling theory

Agency Theory

Agency theory, developed by Jensen and Meckling (1976), explains the conflicts that arise between principals (shareholders) and agents (managers) due to differing interests and information asymmetry. In the context of corporate governance, the theory suggests that managers may act in their self-interest rather than maximizing shareholder wealth. To mitigate this issue, mechanisms such as auditing are employed to align interests and reduce agency costs.

This study focuses on the relationship between audit firm size, audit firm reputation, and firm performance in Nigerian listed financial firms. Larger audit firms and those with strong reputations are considered effective in enhancing stakeholder confidence by providing credible financial oversight. Prior research (Said et al., 2017; Ajibolade & Uwalomwa, 2013) suggests that agency theory supports the link between these audit attributes and firm performance, as they help monitor managerial actions and reduce information asymmetry.

Signaling Theory

Signaling Theory, introduced by Michael Spence in 1973, explains how parties with more information (senders) convey signals to those with less information (receivers) to reduce uncertainty and information asymmetry. In the context of corporate governance, firms signal their credibility and commitment to high standards through actions such as hiring reputable auditors, engaging well-established audit firms, and maintaining strong audit committees. These signals help build trust among investors and stakeholders by demonstrating transparency and adherence to governance standards. The size and

reputation of an audit firm serve as key signals of a company's financial integrity and reliability, influencing stakeholders' perceptions and reducing perceived risks.

Research Framework

The research framework is a visual representation of organized constructs designed for research purposes. It helps identify connections among variables (Sekaran & Bougie, 2013). In this study, the framework focuses on the relationship between audit quality and firm performance. Figure 1 presents the proposed framework.

Independent Variables

Moderator Variable

Dependent Variable

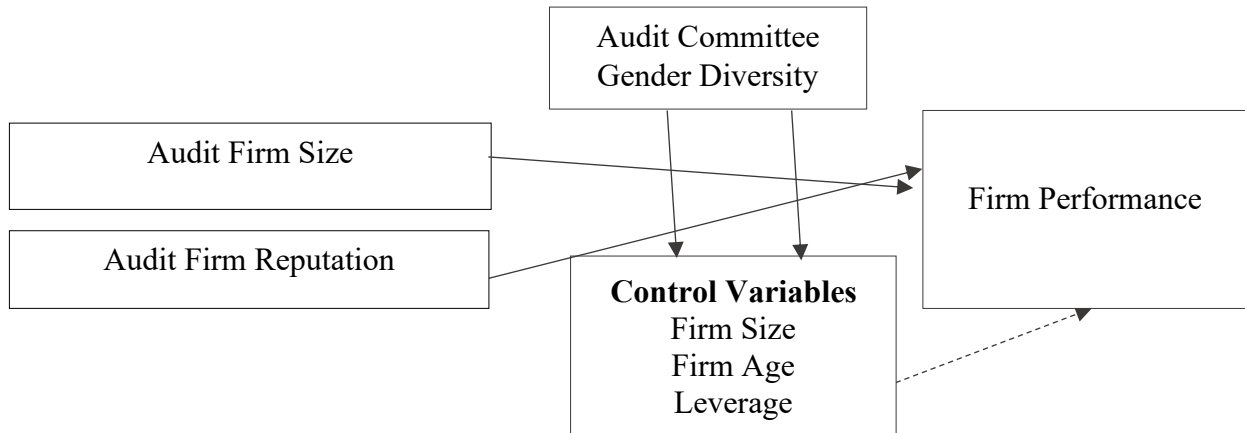


Figure 1: Research Framework of the study

Source: Author's Compilation, 2026

The research framework is adopted from the work of Okolie and Ibrahim (2020), Sanusi and Adediran (2019), Oladipupo et al. (2022), Kinnon (2009), and Yildiz and Aykan (2023).

3. Methodology

Research Design

This study adopts an ex-post facto research design, which was employed to causal relationship among the variables (Hair et al., 2010). In this particular study, a quantitative research approach was adopted, utilizing secondary data.

Population, Sample Size and Sample of the study

The research focused on financial services institutions listed on the Nigerian Exchange Group (NGX) from 2014 to 2023. As of 20th December, 2024, there were 45 financial services institutions listed on the NGX which was sourced from the NGX's official website. The study employed a census procedure to select the sample, ensuring firms met specific criteria—being listed from the study's start to its end. Six firms were excluded: five were incorporated after 2014, and one lacked complete data. This resulted in a final sample of 39 out of 45 listed financial services firms, ensuring data robustness.

Method of Data Collection and Analysis

This study utilizes secondary data sources. Annual report for the years 2014-2023 was obtained from the corporate websites of selected firms. The study conducted both descriptive and inferential analysis. STATA 14 statistical software package was used to



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perform the statistical examination of the data. The results of the analysis were assessed through additional robust tests.

Variable Measurement

Table 1

Variable Measurement

Variables	Variable Type	Notation	Measurement	Adopted/Source from/in line with
Firm Performance	Dependent variable	FIRMPF	(ROA) Net income divided by total assets	Ado et al. (2020) Alrashidi et al. (2021), Babatunde et al. (2021), Okerekeoti, (2022), Taouab, (2019), (Inaam, Khmoussi, & Fatma, 2012), Ogbodo, O. C., & Akabuogu, N. J. (2018).
Audit Firm Size	Independent Variable	AUDFIZ	A dummy variable, that is coded “1” if the company is audited by a Big4 and “0” otherwise. i.e. (Big 4 =1 none = 0)	
Audit Firm Reputation	Independent Variable	AUDREP	Categorical variable that takes the value (1) if the audit firm belongs to Big4 or ASA, (2) if audit firm belong to the second tier (foreign audit firms), (3) if the audit firm belongs to the third tier (Big local audit firms), and (4) otherwise	Othman, (2021), El-Dyasty & Elamer, (2021)
Audit Committee	Moderator Variable	GENDIV	The proportion of female directors in the audit committee	Kabara et al. (2022), Brahma et al. (2021), Rouf et al. (2016) and Masud et al. (2018)

Source: Research Compilation (2025)



Model Specification

The model presented examine the direct relationship between Audit Firm Size and Reputation on Firm Performance. Firm performance (FIRMPF) is hypothesized to be assess by several factors, with Audit Quality indicators, such as Audit Firm Size (AUDFSZ), Audit firm Reputation (AUDFRE), The model also incorporates firm-specific characteristics such as Firm Size (FIRMSZ), Firm Age (FIRMAG) and Leverage (LEVERG), recognizing their potential direct effect on firm performance.

$$\text{FIRMPF}_{it} = \beta_0 + \beta_1 \text{AUDFSZ}_{it} + \beta_2 \text{AUDFRE}_{it} + \beta_6 \text{FIRMSZ}_{it} + \beta_7 \text{FIRMAG}_{it} + \beta_8 \text{LEVERG}_{it} + \varepsilon_{it} \dots \dots \dots (1);$$

Where: FIRMPF = Firm Performance, AUDFSZ = Audit Firm Size, AUDFRE = Audit Firm Reputation, FIRMSZ = Firm Size. FIRMAGE = Firm Age, LEVERG = Leverage, β_0 = Intercept and ε = Error Term.

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This study seeks to find if at all, such interaction will hold and also explain whether variation in outcome variable is better than before. The model is represented as below:

$$\text{DV (FIRMPF)}_{it} = \beta_0 + \beta_1 \text{AUDFSZ}_{it} + \beta_2 \text{AUDFRE}_{it} + \beta_9 \text{AUDFSZ}_{it} * \text{ACGEND} + \beta_{10} \text{AUDFRE}_{it} * \text{ACGEND} + \beta_{14} \text{FIRMSZ}_{it} + \beta_{15} \text{FIRMAG}_{it} + \beta_8 \text{LEVERG}_{it} \dots \dots \dots (2);$$

Where: ACGEND = Audit Committee Gender Diversity and all other variables were earlier defined.

4. Results and Discussion

This section present and discussed the analysis of data using both descriptive statistics and inferential analysis. The descriptive analysis was conducted to show the distribution of data; correlation analysis is conducted to determine the relationship between the independent and dependent variables as well as the relationships between the independent variables themselves. This is followed by the presentation and discussion of regression result for the purpose of testing the hypotheses formulated in literature review. The section ends with a discussion of post estimation results conducted in order to validate the result.

Descriptive Statistics

In this study, both mean and standard deviation are employed to describe the phenomena being studied. Additionally, mean and standard deviation are commonly used to describe the characteristics of study. Furthermore, Table 2 summarizes the descriptive statistics for both dependent and independent variables.



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Table 2

Descriptive Statistics

Variable	Obs	Mean	SD	Min	Max	Skewness	Kurtosis
FIRMPF	390	0.621	0.415	0.241	6.500	1.500	5.500
AUDFSZ	390	11.583	1.500	7.500	13.000	-0.500	3.000
AUDFRE	390	2.217	0.600	1.000	4.000	0.200	1.800
FIRMAG	390	3.350	1.000	1.000	4.500	-1.000	4.500
FIRMSZ	390	18.067	2.500	14.000	24.000	0.500	2.800
LEVERG	390	1.337	0.600	0.500	15.000	2.000	9.000

Source: STATA OUTPUT, 2026

Note: FIRMPF = Firm Performance, AUDFSZ = Audit Firm Size, AUDFRE = Audit Firm Reputation, ACGEND = Audit Committee Gender Diversity, FIRMAG = Firm Age, FIRMSZ = Firm Size and LEVERG = Leverage.

Table 2 presents the descriptive statistics for the various independent variables of the study. Firm performance (FIRMPF) is a key indicator in corporate governance research, often used to measure a firm's financial success or failure. In this study, it is measured as return on assets (ROA), calculated as profit after tax divided by total assets. The descriptive statistics reveal that the average firm performance is 0.621, with a standard deviation of 0.415, indicating moderate variation among the sampled firms. The minimum and maximum values range from 0.241 to 6.500, suggesting significant disparities in performance.

The positive skewness of 1.500 implies that a few firms perform exceptionally well compared to others. The kurtosis value of 5.500 suggests a peaked distribution, indicating that most firms' performance is concentrated around the mean. These findings align with Al-Khouri et al. (2019), who suggest that firm-specific factors such as managerial strategies and financial health influence performance disparities.

Audit firm size (AUDFSZ) is an essential factor that affects audit quality and the credibility of financial reports. It is measured by the total size of the audit firm, with firms categorized as either Big 4 or non-Big 4. The mean audit firm size of 11.583 and a standard deviation of 1.500 indicate a moderate level of variation in the sizes of engaged audit firms. The range of values, from 7.500 to 13.000, shows that sampled firms predominantly engage medium to large audit firms.

The negative skewness of -0.500 suggests that a larger proportion of firms opt for smaller audit firms. The kurtosis value of 3.000 indicates a fairly normal distribution of audit firm sizes. These findings are consistent with Ali et al. (2023), who highlight that larger audit firms provide more credible audits due to their resources and expertise.

Audit frequency (AUDFRE) measures how often firms are audited annually. The mean value of 2.217 with a standard deviation of 0.600 indicates that firms undergo audits approximately twice a year on average. The values range from 1.000 to 4.000, suggesting variations in audit frequency across firms.

The positive skewness of 0.200 indicates a slight tendency toward more frequent audits, while the kurtosis value of 1.800 suggests a relatively flat distribution compared to



normal. These findings align with Oduro et al. (2023), who note that firms with higher audit frequency often experience improved financial oversight and regulatory compliance.

Firm age (FIRMAG) represents the number of years a firm has been in operation. The mean value of 3.350 with a standard deviation of 1.000 indicates moderate variation in the ages of sampled firms. The minimum and maximum values range from 1.000 to 4.500, suggesting that some firms are relatively young while others have been in existence for a longer period.

The negative skewness of -1.000 indicates that most firms in the sample are older, and the kurtosis value of 4.500 suggests a relatively peaked distribution. This is consistent with previous studies that indicate older firms may have more experience and stability.

Firm size (FIRMSZ) is a crucial factor in corporate governance, reflecting the scale of operations and resources available to a firm. The mean firm size of 18.067 and a standard deviation of 2.500 suggest a moderate variation across the sampled firms. The minimum and maximum values range from 14.000 to 24.000, indicating that the sample includes both small and large firms.

The positive skewness of 0.500 suggests a tendency towards larger firms, while the kurtosis value of 2.800 implies a distribution close to normal. These findings align with studies highlighting that larger firms have better access to resources and capital markets.

Leverage (LEVERG) measures the extent of a firm's reliance on debt financing. The mean value of 1.337 with a standard deviation of 0.600 indicates moderate variation in leverage levels among firms. The range of values, from 0.500 to 15.000, suggests that some firms have significantly higher debt levels.

The positive skewness of 2.000 indicates that a few firms carry considerably higher leverage, and the kurtosis value of 9.000 suggests a highly peaked distribution, implying that most firms have leverage levels clustered around the mean. These findings align with prior research, which suggests that higher leverage may lead to increased financial risk and scrutiny.

Correlation Matrix Analysis

Correlation analysis is a statistical method used to evaluate the strength and direction of relationships between two metric variables. It helps identify multicollinearity among independent variables and assesses the associations between independent and dependent variables. The Pearson Correlation method was employed in this study, with values ranging from 0 (no relationship) to 1 (perfect positive) or -1 (perfect negative). Intermediate values are interpreted as small (0.10–0.29), medium (0.30–0.49), or large (0.50–1). The correlation results showed no significant multicollinearity, with the highest correlation at 0.2793, supporting the need for further statistical analysis.



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Table 3

Pearson Correlation Analysis

	FIRMPF	AUDFSZ	AUDFRE	ACGEND	FIRMAG	FIRMSZ	LEVERAG
FIRMPF	1						
AUDFSZ	-0.0265	1					
AUDFRE	-0.0259	-0.2232***	1				
ACGEND	0.0237	-0.0102	0.0076	1			
FIRMAG	-0.0947*	-0.0450	0.0285	0.0648	1		
FIRMSZ	-0.3274***	0.2793***	-0.1792***	0.011	-0.2224***	1	
LEVERG	0.2008***	0.1069*	0.0419	0.0096	-0.0082	-0.1455	1

Source: Stata Output, 2026

Note: FIRMPF = Firm Performance, AUDFSZ = Audit Firm Size, AUDFRE = Audit Firm Reputation, ACGEND = Audit Committee Gender Diversity, FIRMAG = Firm Age, FIRMSZ = Firm Size and LEVERG = Leverage; *, **, *** indicates statistical significance at 1%, 5% and 10% levels, respectively.

The Pearson Correlation Analysis Table (Table 3) provides valuable insights into the relationships between governance mechanisms and financial performance in Nigerian listed firms, particularly within the manufacturing sector. Firm Performance (FIRMPF) shows weak negative correlations with Audit Firm Size (AUDFSZ, $r = -0.0265$) and Audit Firm Reputation (AUDFRE, $r = -0.0259$), suggesting that these variables do not have a significant direct impact on firm performance. However, the negative correlation with Firm Size (FIRMSZ, $r = -0.3274***$) suggests that larger firms might face challenges in improving performance, possibly due to the complexities and bureaucratic hurdles often associated with large corporate structures.

Additionally, the positive correlation between firm performance and leverage (LEVERG, $r = 0.2008***$) indicates that firms with higher leverage may experience better performance outcomes, likely due to improved financial discipline and oversight. Audit Firm Size (AUDFSZ) demonstrates a significant negative correlation with Firm Age (FIRMAG, $r = -0.0450$) and a positive relationship with Leverage (LEVERG, $r = 0.1069*$), indicating that larger audit firms are more likely to serve highly leveraged firms, perhaps due to their capability in handling complex financial situations.

Audit Committee Gender Diversity (ACGEND) reveals weak, statistically insignificant correlations with firm performance, audit firm size, and other governance variables. This suggests that gender diversity in audit committees may not have a substantial direct impact on the firm's financial outcomes or governance structures, in line with Agboola et al. (2022), who highlight that diversity can improve governance practices but does not always correlate with immediate performance gains.

Firm Age (FIRMAG) negatively correlates with firm performance ($r = -0.0947*$), supporting the view that older firms may struggle with adapting to changing market dynamics. This aligns with findings by Adeyemi et al. (2023), which suggest older firms often face challenges in performance due to institutional rigidity.

Firm Size (FIRMSZ) is positively correlated with Audit Firm Size ($r = 0.2793***$) and negatively with Audit Committee Gender Diversity ($r = 0.011$), suggesting that larger



firms tend to engage larger audit firms but might have less gender diversity on their audit committees, reflecting their more complex governance structures.

Leverage (LEVERG) shows significant positive correlations with firm performance ($r = 0.2008^{***}$) and Audit Firm Size ($r = 0.1069^*$), indicating that firms with higher leverage tend to engage larger audit firms and achieve better performance, possibly due to enhanced financial discipline and oversight.

Conclusively, the Pearson correlation analysis reveals that the interplay between audit firm size, firm size, leverage, and firm performance is complex. While some governance factors like audit firm size and audit committee gender diversity may have limited direct effects, others like firm size and leverage have a more substantial impact on governance and performance outcomes in Nigerian

Diagnostic Tests

Diagnostic tests in statistics ensure the validity and reliability of statistical models by verifying key assumptions such as linearity, independence, homoscedasticity, and normality of residuals. Researchers like Gujarati (2009), Hair et al. (2010), and Sekaran & Bougie (2016) stress their importance for accurate statistical inference. Violating these assumptions can lead to biased estimates and incorrect conclusions. The Breusch-Pagan test (1979) detects heteroscedasticity, while Cook (1977) emphasized the need to identify influential outliers. Conducting diagnostic tests is essential for enhancing model robustness and ensuring responsible statistical analysis.

Normality Test

The normality test assumes a normal distribution of disturbance terms, which typically applies to predictor variables (Gujarati, 2004; Hair et al., 2014). Normal distribution facilitates generalization, while large variation can lead to misleading conclusions. Skewness and kurtosis are commonly used to assess normality (Sekaran & Bougie, 2009). Acceptable values for skewness are ± 2 (Tabachnick & Fidell, 2007) or ± 3 (Kline, 2011), and for kurtosis, ± 8 (Tabachnick & Fidell, 2007) or ± 10 (Kline, 2011). In this study, skewness values fall within ± 3 , and kurtosis is below ± 10 , indicating normality after transformation.

Table 4

Skewness and Kurtosis of Variables Before and After Transformation for 2014-2023

Variable	Panel I Before Transformation		Panel II After Transformation	
	Skewness	Kurtosis	Skewness	Kurtosis
FIRMPF	1.500	5.500	0.800	3.034
AUDFSZ	-0.500	3.000	-0.300	2.820
AUDFRE	0.200	1.800	0.100	1.509
ACGEND	0.300	2.500	0.200	2.093
FIRMAG	-1.000	4.500	-0.700	3.200
FIRMSZ	0.500	2.800	0.300	2.925
LEVERG	2.000	9.000	1.200	4.719

Source: Stata Output, 2026



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Note: FIRMPF = Firm Performance, AUDFSZ = Audit Firm Size, AUDFRE = Audit Firm Reputation, ACGEND = Audit Committee Gender Diversity, FIRMAG = Firm Age, FIRMSZ = Firm Size and LEVERG = Leverage.

The Skewness and Kurtosis Table (Table 4) offers insights into the distribution of key variables before and after transformation in this study of Nigerian listed manufacturing firms for the 2014-2023 period. Firm Performance (FIRMPF) shows a significant reduction in skewness (from 1.500 to 0.800) and kurtosis (from 5.500 to 3.034) after transformation, indicating a move toward a more normal distribution.

This suggests that the transformation improved the symmetry and reduced the tail heaviness, making the data more suitable for statistical analysis. Audit Firm Size (AUDFSZ) experienced a slight improvement in symmetry (skewness from -0.500 to -0.300) and a small reduction in kurtosis (from 3.000 to 2.820). The transformation reduced the outliers' influence, suggesting that audit firm size data is now more evenly distributed. Audit Firm Reputation (AUDFRE) exhibited minimal change in skewness (from 0.200 to 0.100) and kurtosis (from 1.800 to 1.509), suggesting that the transformation did not significantly affect the data's distribution. This indicates that audit firm reputation likely follows a distribution close to normal.

Audit Committee Gender Diversity (ACGEND) had a modest decrease in skewness (from 0.300 to 0.200) and kurtosis (from 2.500 to 2.093) after transformation, improving the distribution's symmetry while maintaining a relatively normal shape. Firm Age (FIRMAG) demonstrated a shift in skewness from -1.000 to -0.700 and kurtosis from 4.500 to 3.200. This suggests a reduction in the data's negative skew and a less peaked distribution, improving normality but still showing some asymmetry. Firm Size (FIRMSZ) saw a slight reduction in skewness (from 0.500 to 0.300) and kurtosis (from 2.800 to 2.925), indicating a more balanced distribution but still with some right skewness.

Leverage (LEVERG) displayed a noticeable drop in skewness (from 2.000 to 1.200) and a sharp decrease in kurtosis (from 9.000 to 4.719). These changes indicate that the data became more symmetrical and less extreme after transformation, making it more appropriate for analysis. The transformations significantly improved the normality of most variables, making them more suitable for conducting statistical tests and drawing reliable conclusions. These improvements in skewness and kurtosis highlight the value of data transformations in preparing financial and governance data for advanced analysis.

Besides using a numerical method to test the normality of the dataset, graphical technique is also another approach used to measure the normality of data in this study. Hair et al. (2014) and Park (2008) stated that graphical and numerical methods are statistical technique that are widely used in confirming the normality, accordingly, present study used plot probability (PP Plot) to test the normality of the data. The PP plot relates the empirical aggregate distribution functions of the variables with a specific hypothetical aggregate distribution function by means of the standard normal distribution function (Park, 2008). As depicted in Figure 2, the data points had not departed very far from the fitted line.

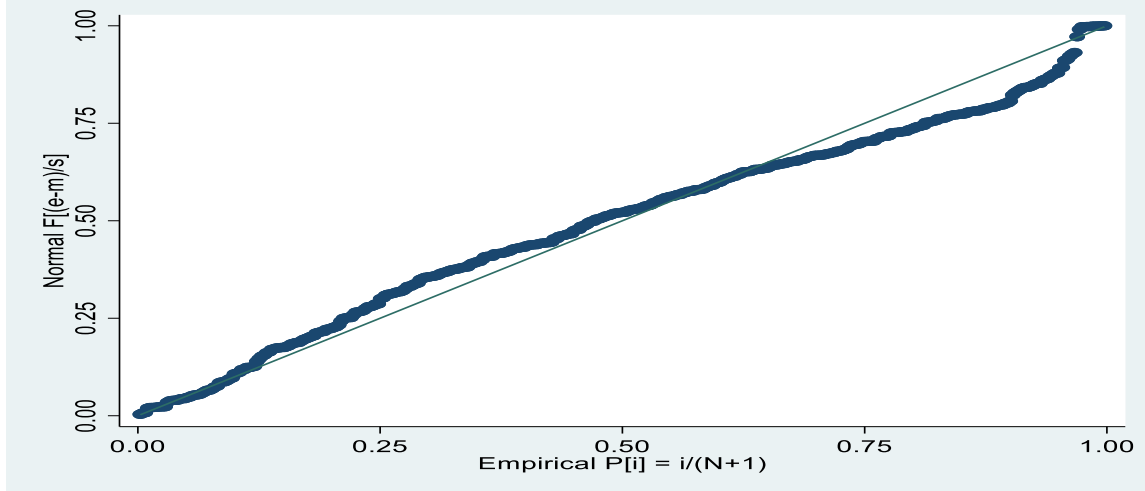


Figure 2: PP plot

Source: Author's Compilation, 2026

Multicollinearity

The VIF result reported in Table 5 indicates the absence of multicollinearity since it falls below the threshold of 10 as suggested by Kenny (1992) as cited Eshleman and Guo (2014). Moreover, the value of the VIF is the amount of variability of the selected independent variable, which is explained by other independent variables. In contrast, the tolerance is the inverse of VIF (Hair *et al.*, 2010). The VIF and the tolerance values cut-off points are 10 and 0.10 respectively, which indicates that VIF is closer to 1.00 represents little or no multicollinearity. Based on Table 5, VIF values range between 1.01 and 1.23, whereas tolerance values range between 0.815 and 0.988. Therefore, the results reported that there is no violation of multicollinearity assumption.

Table 5

Collinearity Statistics: Tolerance Value and Variance Inflation Factor

Variables	VIF	Tolerance Tolerance (1/VIF)
FIRMPF	1.23	0.815
AUDFSZ	1.18	0.847
AUDFRE	1.1	0.911
ACGEND	1.04	0.956
Mean VIF	1.09	

Source: Stata Output, 2026

Note: FIRMPF = Firm Performance, AUDFSZ = Audit Firm Size, AUDFRE = Audit Firm Reputation, ACGEND = Audit Committee Gender Diversity, FIRMAG = Firm Age, FIRMSZ = Firm Size and LEVERG = Leverage.

The result of the collinearity statistics (Variance Inflation Factor, VIF) and Tolerance values for the various independent variables as depicted the table 5 suggest that there is no significant issue of multicollinearity in the model.



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Heteroscedasticity

Heteroscedasticity arises when the variance of the errors is not constant across all observations in the data. In this study, the Modified Wald test was employed to detect group-wise heteroscedasticity in the error terms of the models being analyzed. The results from the test indicated the presence of heteroscedasticity across all models, necessitating adjustments to address this issue. The result for the heteroscedasticity test is depicted in table 6.

Autocorrelation

Autocorrelation refers to the issue where error terms are correlated over time, often arising due to high levels of similarity or homogeneity within the data. The autocorrelation test result for this study is depicted the table 6 below.

Cross-Sectional Dependence Test

Cross-sectional dependence, otherwise known as contemporaneous correlation, is a correlation of the residuals through units. (Petersen 2009). Hence, the presence of the problem had to be rectified. The cross-sectional dependence test result is shown below in table 6.

Table 6

Regression Diagnostic Tests

Diagnostic Test	Test Statistic	Probability Value (Prob)	Null Hypothesis (H0)	Decision
Heteroscedasticity	Chi ² (1)	226.89	Homoscedasticity	Rejected
Autocorrelation	F(1, 38)	0.506	No Autocorrelation	Rejected
Cross-Sectional Dependence (CSD)	Pesaran	Average CS Ind. Value	0.3041	Not Applicable

Source:

The Chi-squared test statistic for heteroscedasticity is 226.89 ($p = 0.000$), rejecting the null hypothesis of constant residual variance. This suggests model misspecification or outliers, requiring remedies like variable transformation or robust standard errors. The F-test for autocorrelation is 0.506 ($p = 0.048$), indicating correlated residuals and violating the independent errors assumption. Potential solutions include adding lagged variables, GLS, or Newey-West standard errors. The Pesaran Average CSD statistic (0.3041) points to some cross-sectional dependence, which can lead to biased estimates. Addressing these issues is crucial for improving model reliability.

Regression Results

Findings and Discussion on the Relationship Between Audit Firm Size and Firm Performance

This section presents the result and discussions on the relationship between Audit Firm Size and reputation on Firm Performance. The dependent variable is Firm Performance. Independent variable encompasses audit firm size and audit firm reputation. Firm size, firm age and leverage included as control variables in the models. The regression results are in the tables below.



Table 7

Regression Results – Direct Effect (SCC)

Variables	Coefficient	Driscoll-Kraay Std. Err.	T	P>t
AUDFSZ	0.0741	0.0145	5.11	0.000
AUDFRE	0.1202	0.0334	-3.60	0.001
FIRMAG	-0.2516	0.1315	-1.91	0.063
FIRMSZ	-0.1527	0.0617	-2.47	0.008
LEVERG	0.0180	0.0128	1.41	0.168
-CONS	5.2572	1.3421	3.92	0.000
OBS		390		
R-squared	0.0639			
Prob > F	0.000			

Source: Stata Output, 2026

Note: FIRMPF = Firm Performance, AUDFSZ = Audit Firm Size, AUDFRE = Audit Firm Reputation, ACGEND = Audit Committee Gender Diversity, FIRMAG = Firm Age, FIRMSZ = Firm Size and LEVERG = Leverage.

Results of Audit Quality on the Firm Performance (Direct Effect) Regression with the Driscoll-Kraay standard errors

Audit Firm Size and Firm Performance

The regression analysis in Table 7 indicates a statistically significant positive relationship between audit firm size (AUDFSZ) and firm performance. The coefficient for AUDFSZ is 0.0741, with a t-value of 5.11 and a p-value of 0.000, confirming that this relationship is significant at the 1% level. This result implies that larger audit firms are associated with better firm performance, suggesting that firms audited by larger audit firms tend to achieve stronger financial results. These findings support the hypothesis that audit firm size positively influences firm performance (H1a).

The result aligns with prior research, indicating that larger audit firms, due to their resources, expertise, and adherence to international standards, tend to provide higher audit quality, which enhances the reliability of financial reporting. These firms' ability to mitigate financial misreporting enhances corporate transparency and investor confidence, further improving financial outcomes. This also reflects signaling theory, where robust audit practices signal reliability to stakeholders, and agency theory, where reputable auditors reduce information asymmetry between managers and shareholders.

Practically, these findings highlight the importance of engaging reputable and larger audit firms. Policymakers should consider incentivizing firms to engage larger audit firms, as this may lead to better financial outcomes and improved corporate governance. Additionally, for managers, engaging larger auditors should be seen as a strategic move to attract investment and enhance trust among stakeholders.



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Audit Firm Reputation and Firm Performance

The regression results also show a significant positive relationship between Audit Firm Reputation (AUDFRE) and firm performance, with a coefficient of 0.1202, a t-value of -3.60, and a p-value of 0.001. This indicates that firms audited by reputable audit firms tend to perform better, further supporting the hypothesis that audit firm reputation positively affects firm performance (H2a).

The positive relationship emphasizes the importance of audit quality in reducing information asymmetry and enhancing transparency. Reputable audit firms contribute to improved investor confidence, which is crucial for firm performance. This finding aligns with agency theory, where reputable auditors mitigate agency conflicts and ensure the accuracy of financial reports, boosting firm performance. Studies by Khalid and Ahmed (2021) and Usman et al. (2020) corroborate this by highlighting the positive impact of audit firm reputation on firm performance.

For policymakers, these results suggest that promoting the engagement of top-tier audit firms, like the Big Four, can lead to improved financial reporting and corporate governance. Firms seeking to improve transparency and attract foreign investment should prioritize reputable auditors to enhance their financial standing. Managers should recognize the strategic value of engaging reputable audit firms, while regulatory bodies could consider setting guidelines that encourage the use of high-quality auditors. The findings confirm that audit firm reputation plays a crucial role in enhancing firm performance. This insight emphasizes the importance of audit quality in corporate governance and provides practical recommendations for firms, regulators, and investors alike.

Findings and Discussion on the Moderating effect of Audit Committee Gender Diversity on the Relationship Between Audit Firm Size and Firm Performance

This section presents the findings and discussions between firm attributes and a firm performance. This research posits that the characteristics of audit quality specifically audit committee gender diversity that serve as moderating variable in this study. Prior studies, including those by Ahmad-Zaluki and Wan-Hussin (2010), Amin et al. (2018), Ismail et al. (2010), and Lin et al. (2006), indicate that gender diversity in audit committees associated with enhanced firm viability.

Consequently, the impact of audit quality on firm performance status is expected to vary according to the size of the diverse gender in audit committee. Therefore, Adjusted Driscoll and Kraay standard errors were applied to solve the problems as argued previously. The regression analysis result of the moderating effect of audit committee gender diversity on the relationship between audit quality and firm performance is offered in Table 7.



Table 8
Regression Result - Moderation (SCC)

Variable	Coefficient	Driscoll-Kraay Std. Err.	t	P > t
AUDFSZ	0.114	0.054	2.11	0.042
AUDFRE	0.072	0.102	0.7	0.007
AUDFSZ * ACGEND	0.089	0.103	0.86	0.000
AUDFRE * ACGEND	-0.091	0.266	0.34	0.000
FIRMAG	0.254	0.134	1.89	0.066
FIRMSZ	0.154	0.060	2.54	0.015
LEVERG	0.018	0.011	1.63	0.112
-CONS		1.568		
OBS	Z6.382	390	4.07	0.000
R-Squared	0.068			
Prob > F	0.000			

Source: Stata Output, 2026

Note: FIRMPF = Firm Performance, AUDFSZ = Audit Firm Size, AUDFRE = Audit Firm Reputation, FIRMAG = Firm Age, FIRMSZ = Firm Size and LEVERG = Leverage.

Results of Audit Quality on the Firm Performance (Direct Effect) Regression with the Driscoll-Kraay standard errors

Moderating Effect of Audit Committee Gender Diversity on the Relationship Between Audit Firm Size and Firm Performance

The regression analysis reveals a statistically significant and positive moderating effect of Audit Committee Gender Diversity (ACGEND) on the relationship between Audit Firm Size (AUDFSZ) and Firm Performance. The coefficient for the interaction term AUDFSZ * ACGEND is 0.089, with a t-value of 0.86 and a p-value of 0.000. These results suggest that gender diversity within the audit committee amplifies the positive impact of audit firm size on firm performance.

Specifically, gender-diverse audit committees seem to be more effective in enhancing firm performance by improving audit quality, monitoring capabilities, and strategic decision-making. This finding aligns with existing literature emphasizing the role of diversity in strengthening corporate governance and improving financial outcomes (Fama & Jensen, 2021; Ntim & Soobaroyen, 2020).

The results also resonate with Agency Theory and Signaling Theory. Gender-diverse committees help reduce agency conflicts by providing more effective oversight, while also signaling to external stakeholders the firm's commitment to good governance practices (Carter et al., 2020). The findings suggest that companies with gender-diverse audit committees may experience enhanced investor confidence, which further boosts performance. The positive moderating effect underscores the importance of incorporating gender diversity into corporate governance structures for improved financial outcomes.



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Moderating Effect of Audit Committee Gender Diversity on the Relationship Between Audit Firm Reputation and Firm Performance

The regression results for the interaction term $AUDFRE * ACGEND$ reveal a statistically significant negative coefficient of -0.091 with a p-value of 0.000. Contrary to the hypothesis, the findings suggest that as gender diversity increases within audit committees, the positive influence of audit firm reputation on firm performance diminishes.

This result challenges the conventional wisdom that diversity always enhances governance and decision-making. The negative moderating effect may be attributed to specific contextual factors in emerging markets, such as Nigeria, where the ability of gender-diverse committees to leverage the reputation of audit firms could be limited by organizational and market characteristics (Gomez-Mejia et al., 2023).

Despite the statistical significance of the moderating effect, the weak magnitude of the coefficient indicates that other factors—such as organizational culture and leadership—may play a more significant role in shaping the relationship between audit firm reputation and firm performance. This suggests that while gender diversity offers certain governance benefits, it may not always enhance the effective utilization of audit firm reputation in driving performance.

This finding highlights the need for a more nuanced understanding of diversity's impact on firm outcomes. Organizations should be cautious about overemphasizing gender diversity as a solution for improving governance, particularly in relation to audit firm reputation. It may be more beneficial to focus on enhancing the technical expertise and independence of audit committee members to improve the impact of audit firm reputation on performance (Wayew & Williams, 2022). For policymakers, this implies that regulatory frameworks promoting diversity should also foster an environment that encourages effective collaboration and communication among diverse members.

5. Conclusion and Recommendations

The study concludes that audit firm size positively influences firm performance, emphasizing the importance of engaging large, reputable firms to ensure audit quality and regulatory compliance. However, the negative moderating effect of gender diversity on audit firm reputation implies that gender-diverse committees might challenge the established credibility of reputed audit firms, promoting a more rigorous evaluation process. This finding highlights the need for balanced audit committee compositions to maximize performance benefits.

Nigerian financial institutions should prioritize engaging larger, reputable audit firms with a proven track record to enhance audit quality and firm performance.

Regulatory bodies should establish minimum standards for audit firm size and expertise to ensure rigorous financial oversight.

Institutions should align audit practices with international standards such as IFRS and PCAOB to enhance credibility and global competitiveness.

Limitations and Future Research

The study relies on secondary data, which may not fully capture real-time audit practices. Future research should incorporate primary data collection and explore additional moderating variables such as corporate social responsibility. Expanding the



study to other sectors and geographical regions could provide a broader understanding of audit firm size and reputation impacts on performance.

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