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Audit Committee Effectiveness and Corporate Financial Performance in Listed Nigerian Manufacturing Firms

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Abstract
Corporate governance is essential for financial stability and operational efficiency, with audit committees serving as a key oversight mechanism. This study examines the relationship between audit committee effectiveness and corporate financial performance, focusing on scale efficiency in Nigerian manufacturing firms. Using panel data from 49 listed manufacturing firms between 2012 and 2022, the study employs regression analysis to evaluate the impact of audit committee size and independence on scale efficiency. The findings reveal that audit committee size has a negative but insignificant effect on scale efficiency, suggesting that increasing committee size does not necessarily improve financial performance. Similarly, audit committee independence shows an insignificant relationship with scale efficiency, indicating that independence alone does not enhance operational efficiency. However, among the control variables, leverage exhibited a significant negative effect on scale efficiency, underscoring the influence of a firm's financial structure on its operational performance. The study underscores the need for stronger governance enforcement and emphasizes that firms should prioritize expertise over structural attributes. Further research should explore additional governance factors influencing financial performance in Nigerian manufacturing firms.

Keywords: Audit Committee, Corporate Governance, Scale Efficiency, Nigerian Manufacturing Firms.

1. Introduction

Corporate governance plays a fundamental role in ensuring transparency, accountability, and the financial sustainability of organizations. Among its key mechanisms, the audit committee serves as a crucial oversight body responsible for monitoring financial reporting, ensuring regulatory compliance, and maintaining internal control systems. Given the increasing concerns over financial mismanagement and corporate failures, the effectiveness of audit committees has gained significant attention in governance and financial performance research (Al-Dhamari & Chandren, 2021). However, the extent to which audit committee characteristics, particularly size and independence, influence financial performance remains a subject of ongoing debate, especially in emerging economies such as Nigeria.

The primary function of an audit committee is to safeguard the integrity of financial reporting by acting as an intermediary between external auditors, management, and the board of directors. A well-functioning audit committee ensures that financial statements accurately represent a company's financial position, thereby protecting shareholder interests, (Aigienohuwa & Irowa-Omoregie 2025). The effectiveness of an audit committee is largely determined by its composition, with size and independence being two critical attributes. Larger audit committees may bring diverse expertise and knowledge, enhancing the quality of financial oversight, (Aigienohuwa & Irowa-Omoregie 2025). On the other hand, a higher level of independence, characterized by the inclusion of non-executive members, is expected to strengthen objectivity and reduce the likelihood of managerial influence in financial reporting (Hassan et al., 2019). In Nigeria, regulatory bodies such as the Financial Reporting Council of Nigeria (FRCN) and the Securities and Exchange Commission (SEC) have established governance guidelines that emphasize independent audit committees as a means of improving corporate accountability (Osemeke & Adegbite, 2016). However, compliance with these regulations varies across firms, raising concerns about their practical effectiveness.

Fit is worthy of note that financial performance is a key indicator of an organization's success and sustainability. One widely used measure of financial performance is scale efficiency, which assesses how well a company utilizes its turnover and assets to generate profits. Scale efficiency provides a more precise evaluation of a firm's operational performance compared to traditional financial metrics like return on assets (ROA) or return on equity (ROE) (Mohiuddin et al., 2021). The relationship between audit committee attributes and financial performance has been widely examined, but existing studies yield mixed findings. Some scholars argue that effective audit committees enhance financial performance by improving financial oversight, minimizing fraudulent practices, and ensuring greater financial transparency (Yasser et al., 2019). Others contended that this relationship is not straightforward and may depend on factors such as firm size, industry characteristics, and regulatory environments (Bala et al., 2022).

Generally, audit committee independence is a cornerstone of effective governance, as independent members are expected to provide unbiased oversight and mitigate potential conflicts of interest in financial reporting. Regulatory frameworks emphasize the inclusion of non-executive directors on audit committees to strengthen financial accountability (Babatunde & Olaniran, 2019). In Nigeria, corporate governance codes require a majority of audit committee members to be independent, but challenges in enforcement and implementation create disparities in compliance. While independent audit committees are theoretically expected to enhance financial performance, practical constraints such as political influences and weak enforcement mechanisms may undermine their effectiveness.

Despite the extensive body of literature on audit committee effectiveness, several research gaps remain. First, most studies on audit committee attributes and financial performance have been conducted in developed economies, with limited empirical evidence from emerging markets like Nigeria. Second, while previous research often relies on broad financial performance indicators, such as ROA and ROE, fewer studies have explored the role of audit committee characteristics in enhancing scale efficiency, which directly reflects a firm's ability to maximize output from available resources (Osazuwa et al., 2020).

This study aims to fill these gaps by examining the impact of audit committee size and independence on the financial performance of listed manufacturing firms in Nigeria, using scale efficiency as the primary performance metric. By focusing on these governance attributes, the research seeks to provide empirical insights that will contribute to corporate governance literature and inform policy decisions. The findings are expected to offer valuable recommendations for regulators, corporate leaders, and policymakers seeking to strengthen governance practices and improve financial performance in Nigeria's manufacturing sector.

2. Literature Review and Hypotheses Development

Audit Committee Size and Scale Efficiency (Financial Performance)

Audit committee size, defined as the number of members within the audit committee, plays a crucial role in financial oversight and governance. Scale efficiency, a measure of operational performance, evaluates a firm's ability to optimize resource utilization to maximize output relative to input (Aigienohuwa & Irowa-Omoregie 2025). The relationship between audit committee size and scale efficiency has been extensively examined, with empirical findings yielding mixed results—positive, negative, or non-significant.

Several studies have reported a positive and significant relationship between audit committee size and scale efficiency. Larger audit committees often bring a broader range of expertise, improving monitoring capabilities and financial oversight. Hassan et al. (2021) found that audit committee size positively influences scale efficiency in manufacturing firms, as larger committees enhance internal control mechanisms. Similarly, Adegbite and Olaniran (2019) found that firms with larger audit committees in Nigeria exhibited higher resource optimization and better financial performance. Their findings suggest that increased committee size facilitates effective governance by incorporating diverse perspectives in decision-making.

Farhan et al. (2020) observed that firms with larger audit committees experienced improved scale efficiency due to enhanced financial scrutiny and better operational decision-making. Likewise, Khan et al. (2022) found a positive correlation between audit committee size and scale efficiency in sub-Saharan African manufacturing firms, attributing the findings to greater oversight capacity. Additionally, Osazuwa et al. (2021) demonstrated that larger audit committees contribute to improved financial reporting quality, leading to better resource allocation and higher operational efficiency.

Conversely, some studies have reported a negative and significant relationship between audit committee size and scale efficiency. Excessively large committees may face coordination challenges, slower decision-making, and bureaucratic inefficiencies, which can negatively impact operational performance. Bala and Sule (2021) found that manufacturing firms with larger audit committees in Nigeria experienced reduced scale efficiency due to prolonged deliberations and operational delays. Similarly, Ibrahim et al. (2021) argued that overly large audit committees sometimes dilute accountability, leading to inefficient governance practices.

Thiruvadi and Huang (2020) highlighted that in emerging markets, larger committees might struggle with conflicting opinions, leading to inefficiencies in financial oversight. Babatunde et al. (2021) further observed that audit committees with more than seven members faced challenges in reaching a consensus, slowing down strategic decision-making and negatively impacting scale efficiency.

Other studies have found an insignificant relationship between audit committee size and scale efficiency, suggesting that size alone may not be a sufficient determinant of effectiveness. Osemeke and Adegbite (2020) found a weak positive relationship in Nigerian manufacturing firms, but the impact was statistically insignificant. They suggested that expertise and independence within the audit committee might be more critical than size. Similarly, Hassan et al. (2019) reported a non-significant negative relationship in African manufacturing firms, emphasizing that audit committee effectiveness depends on the quality of deliberations rather than the number of members.

Adewole et al. (2020) found no significant relationship between audit committee size and scale efficiency in firms listed on the Nigerian Exchange Group, attributing their findings to other overriding factors such as financial expertise and regulatory compliance. Osazuwa et al. (2020) also noted that firms with strong internal controls and governance structures did not experience a direct impact of committee size on scale efficiency.

The empirical evidence on the relationship between audit committee size and scale efficiency remains inconclusive. While some studies support the view that larger committees improve financial oversight and operational efficiency, others argue that excessive size may hinder decision-making and accountability. The mixed findings suggest that while audit committee size influences governance effectiveness, its impact on performance may be more meaningful when considered alongside other attributes such as independence, gender diversity, and diligence, which are key dimensions of audit committee effectiveness examined in this study;

H1: Audit committee size has no significant effect on the financial performance of Nigerian manufacturing firms.

Audit Committee Independence and Scale Efficiency (Financial Performance)

Audit committee independence, defined as the proportion of independent or non-executive members within the audit committee, is widely regarded as a fundamental element of effective corporate governance. Independent audit committees provide unbiased oversight, ensuring transparency in financial reporting and mitigating agency problems (Onyabe et al., 2018). Empirical studies on the relationship between audit committee independence and scale efficiency have produced mixed findings. Many studies have found a positive and significant relationship between audit committee independence and scale efficiency. Hassan et al. (2021) reported that independent audit committees enhance monitoring effectiveness, leading to improved resource allocation and operational efficiency. Adegbite and Olaniran (2019) found that manufacturing firms with a higher proportion of independent audit committee members experienced greater scale efficiency due to improved governance structures. Their study emphasized that independent members are more likely to challenge management decisions, ensuring optimal resource utilization. Khan et al. (2022) found that in emerging markets, independent audit committees play a critical role in improving operational efficiency, as they provide objective assessments of financial risks and opportunities. Osazuwa et al. (2021) demonstrated that audit committee independence reduces information asymmetry, allowing firms to identify inefficiencies and enhance scale efficiency. Similarly, Mohiuddin et al. (2021) argued that independent audit committees improve financial discipline, ensuring that firms maximize output relative to their available resources.

Conversely, some studies have reported a negative and significant relationship between audit committee independence and scale efficiency. Ibrahim et al. (2021) found that excessive independence in audit committees led to slower decision-making processes, which negatively affected operational efficiency in Nigerian manufacturing firms. Bala and Sule (2021) observed that independent committee members often lacked firm-specific knowledge, leading to recommendations that were not always practical for improving efficiency. Babatunde et al. (2021) noted that highly independent committees might create tensions with management, delaying strategic decisions and negatively impacting efficiency. Thiruvadi and Huang (2020) highlighted that in complex operational environments, the emphasis on independence could come at the expense of hands-on expertise, reducing the committee's ability to address operational inefficiencies effectively.

Other studies have found a non-significant relationship between audit committee independence and scale efficiency. Adewole et al. (2020) found a weak positive relationship but concluded that independence alone was not enough to drive significant improvements in operational efficiency. They suggested that expertise and diligence of committee members played a more important role. Hassan et al. (2019) reported a non-significant negative relationship, arguing that in firms with strong governance structures, independence had little additional impact on scale efficiency.

Osazuwa et al. (2020) found insignificant relationships in firms with well-established internal controls, suggesting that broader governance frameworks might overshadow the role of independent audit committees. Similarly, Osemeke and Adegbite (2020) noted that in highly regulated industries, external oversight mechanisms often compensate for any potential inefficiencies related to independence.

The empirical evidence on the relationship between audit committee independence and scale efficiency remains mixed. While some studies emphasize the role of independent members in enhancing accountability and optimizing resource utilization, others highlight the potential drawbacks of excessive independence. Insignificant findings suggest that independence alone may not guarantee improved scale efficiency, emphasizing the need for a holistic approach to audit committee composition. This study seeks to explore this relationship within the Nigerian manufacturing sector, where governance effectiveness is crucial for financial performance and operational efficiency.

The empirical literature presents varying perspectives on the relationship between audit committee characteristics and financial performance, specifically in terms of scale efficiency. Some studies find a positive and significant relationship, supporting the view that larger and more independent audit committees improve governance oversight and resource allocation. However, other studies report negative or non-significant findings, suggesting that beyond size and independence, other factors—such as expertise, regulatory frameworks, and internal controls—may play a more crucial role in influencing scale efficiency.

Given these mixed findings, this study contributes to the discourse by examining the specific impact of audit committee size and independence on scale efficiency in Nigerian manufacturing firms. The research will provide empirical evidence on how governance mechanisms function in the context of Nigeria's economic and regulatory environment, offering insights for policymakers, corporate executives, and scholars interested in corporate governance and financial performance.

H2: Audit committee independence has no significant effect on the financial performance of Nigerian manufacturing firms.

Theoretical Framework

The relationship between audit committee effectiveness and corporate financial performance can be analyzed through agency theory, resource dependence theory, and stewardship theory. Among these, agency theory provides the most relevant perspective for this study. Agency theory highlights conflicts between managers (agents) and shareholders (principals), where managers may prioritize personal interests over shareholder value (Jensen & Meckling, 1976). To mitigate this, oversight mechanisms like independent audit committees ensure transparency, accountability, and proper financial reporting (Hassan et al., 2021). Empirical studies confirm this, with Khan et al. (2022) and Adegbite et al. (2020) finding that independent audit committees improve financial discipline and resource efficiency. This theory suggests that audit committees provide critical expertise, improving governance and financial oversight (Pfeffer & Salancik, 1978). Research by Osazuwa et al. (2021) and Mohiuddin et al. (2021) found that appropriately sized audit committees enhance operational efficiency. However, Ibrahim et al. (2021) warned that excessively large committees may face coordination challenges.

Unlike agency theory, stewardship theory assumes managers act in the organization's best interest (Donaldson & Davis, 1991). Studies by Hassan et al. (2019) and Osazuwa et al. (2020) suggest that engaged audit committees foster financial transparency and long-term efficiency. Given Nigeria's governance challenges, agency theory is most applicable. It underscores the importance of audit committee independence and optimal size in enhancing financial oversight and scale efficiency (Farhan et al., 2020). This framework supports evaluating audit committee attributes as key drivers of corporate financial performance.

3. Methodology

This study examines the relationship between audit committee effectiveness and corporate financial performance in Nigerian manufacturing firms. It employs a quantitative research design using a panel research approach, integrating cross-sectional and time-series data from 49 firms over the period 2012–2022. This approach accounts for firm-specific differences and the longitudinal effects of audit committee attributes on financial performance. The positivist research philosophy guides this study, emphasizing empirical evidence and statistical analysis to test hypotheses. The population consists of 50 Nigerian manufacturing firms listed on the Nigerian Exchange Group (NGX), with purposive sampling selecting 49 firms based on data availability. Secondary data is sourced from audited annual reports and financial statements of listed firms, providing a reliable and standardized basis for evaluating corporate financial performance and audit committee attributes. Panel regression analysis is employed to examine relationships, with fixed effects and random effects models tested using the Hausman test. The study focuses on audit committee size and audit committee independence as independent variables, with firm size and leverage as control variables. Scale efficiency (measured as gross profit relative to turnover and assets) serves as the dependent variable.

4. Results and Discussion

This section presents the empirical results of the study, analyzing the relationship between audit committee effectiveness and corporate financial performance in Nigerian manufacturing firms.

Descriptive Statistics

Table 1: Descriptive statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev	N	JB (Normality)
SEt	30	29	93	-198	21	476	0.0000***
SEa	3.1	3.6	617	-256	36	487	0.0000***
ACS	5.5	6	9	0	1	476	56.68 (0.0000***)
ACI	59	50	125	0	22	475	54.67 (0.0000***)
FSA	16	16	22	11	2.2	487	13.80 (0.0010**)
LEV	91	59	2354	12	206	487	0.0000***

Note: SEt – Scale Efficiency (Turnover); SEa: Scale Efficiency (Assets); ACS: Audit Committee Size; ACI: Audit Committee Independence; LEV: Leverage; FSA: Firm Size. (FSA and LEV are Control Variables).
Source: Researcher Computation (2024).

The descriptive statistics table provides an overview of the key variables used in this study, including their central tendencies (mean, median), dispersion (standard deviation), and range (maximum and minimum values). The mean value for Scale Efficiency based on Turnover (SEt) is 30, with a median of 29, indicating a relatively symmetric distribution. However, its minimum value of -198 suggests that some firms have negative scale efficiency, reflecting inefficiencies in resource utilization. Similarly, Scale Efficiency based on Assets (SEa) has a mean of 3.1, but its high standard deviation (36) and wide range (-256 to 617) indicate significant variability across firms, suggesting that some firms effectively utilize assets while others experience severe inefficiencies. The Jarque-Bera (JB) normality test for both SEt and SEa has a p-value of 0.0000, confirming that these variables deviate significantly from a normal distribution.

The statistics for audit committee attributes reveal notable insights. Audit Committee Size (ACS) has a mean of 5.5 and a median of 6, with committee sizes ranging from 0 to 9 members, implying that some firms lack a functional audit committee. The standard deviation (1) suggests low variability in committee size. The Audit Committee Independence (ACI) variable has a mean of 59%, with values ranging from 0% to 125%, showing that while most firms have independent members, some exceed regulatory expectations. The high standard deviation (22) indicates considerable dispersion among firms. The JB normality test for both ACS (56.68, p = 0.0000), and ACI (54.67, p = 0.0000) suggests significant departures from normality, emphasizing the presence of skewed distributions.

The control variables—Firm Size (FSA) and Leverage (LEV)—exhibit notable characteristics. FSA has a mean of 16, with a range of 11 to 22, and a moderate standard deviation (2.2), implying consistency in firm sizes across the sample. The JB normality test (p = 0.0010) indicates that FSA is also not normally distributed. Leverage (LEV) shows extreme variation, with a mean of 91, a median of 59, and a maximum of 2,354, indicating that some firms rely heavily on debt financing. The high standard deviation (206) highlights the presence of extreme leverage levels, which may influence financial performance. The JB normality test (p = 0.0000) confirms that leverage is heavily skewed, suggesting potential heteroskedasticity concerns in regression analysis. The robust fixed effect regression was employed to address the issues of non-normality and heteroskedasticity.

Correlation Analysis

The correlation analysis examines the strength and direction of the relationships between the study variables, providing insights into their potential associations and dependencies.

Table 2: Correlation Analysis

Table 2a: Correlation Analysis for Scale Efficiency (Turnover)						**Table 2b: Correlation Analysis for Scale Efficiency by Assets**					
Var	**SEt**	**ACS**	**ACI**	**FS**	**LEV**	**Var**	**SEa**	**ACS**	**ACI**	**FS**	**LEV**
Set	1					Sea	1				
ACS	0.046	1				ACS	0.0307	1			
ACI	0.0165	-0.1233	1			ACI	-0.0714	-0.1233	1		
FS	0.1859	0.4604	0.2119	1		FS	0.2323	0.4604	0.2119	1	
LEV	-0.0594	-0.0063	0.1088	-0.1058	1.0000	LEV	-0.7382	-0.0063	0.1088	-0.1058	1.0000

Source: Researcher Computation (2024).

The correlation analysis presented in Table 4.2 examines the relationships among scale efficiency (based on turnover and assets), audit committee attributes, firm size, and leverage. A moderate positive correlation (0.4118) exists between Scale Efficiency based on Turnover (SEt) and Scale Efficiency based on Assets (SEa), suggesting that firms with higher turnover efficiency tend to also have better asset utilization. Audit Committee Size (ACS) and Audit Committee Independence (ACI) exhibit weak correlations with both SEt (0.0460 and 0.0165, respectively) and SEa (0.0307 and -0.0714, respectively), indicating that audit committee attributes may not directly influence scale efficiency. Additionally, a negative correlation (-0.1233) between ACS and ACI suggests that as audit committees increase in size, their independence may slightly decline.

Among the control variables, Firm Size (FS) shows positive correlations with SEt (0.1859) and SEa (0.2323), implying that larger firms tend to achieve better efficiency levels. Firm size also has a moderate positive correlation with ACS (0.4604) and ACI (0.2119), suggesting that larger firms tend to have bigger and more independent audit committees. However, leverage (LEV) exhibits a strong negative correlation with SEa (-0.7382), indicating that highly leveraged firms struggle with asset utilization efficiency. Leverage also shows weak negative correlations with SEt (-0.0594) and FS (-0.1058) but a slight positive correlation with ACI (0.1088), suggesting that higher leverage levels might encourage firms to maintain more independent audit committees. Overall, the correlation results suggest that firm size and leverage play more significant roles in financial efficiency compared to audit committee characteristics.

Regression Analysis

The regression analysis evaluates the impact of audit committee effectiveness on corporate financial performance, determining the significance and direction of the relationships between the independent and dependent variables.

Table 3: Regression Results

Variable	Expected Sign	Model 1: SEt	Model 2: SEa
Constant	-	14.12 (0.648)	-12.03 (0.070)
ACS	-	-1.63 (0.138)	-1.91 (0.050)*
ACI	-	-0.06 (0.120)	-0.03 (0.331)
FS	+	1.62 (0.404)	0.32 (0.852)
LEV	-	-0.02 (0.003)**	-0.11 (0.000)***
F-value (p-value)		3.00 (0.007)***	43.25 (0.000)***
Breusch-Pagan LM Test (p-value)		357.37 (0.000)***	2414.22 (0.000)***
Portmanteau Test (p-value)		45.00 (0.4720)	46.74 (0.483)
Ramsey RESET (p-value)		14.44 (0.000)***	73.21 (0.000)***
Hausman Test (p-value)		275.42 (0.000)***	118.99 (0.000)***
Multicollinearity test		1.19	1.20
Heteroskedasticity Test (p-value)		269.81 (0.0000)***	2414.22 (0.0000)***
R-square		0.0419	0.358
Observations		472	472

p-values in parentheses indicate significance at the 5% level, ** at 1%, and *** at 0.1%.
Source: Researcher Computation (2024).

The regression results for Model 1 examine the impact of audit committee attributes and control variables on Scale Efficiency based on Turnover (SEt). The constant term (14.12, p = 0.648) is statistically insignificant, indicating that without the influence of the independent variables, SEt does not exhibit a significant base level. Audit Committee Size (ACS) shows a negative but insignificant effect (-1.63, p = 0.138), suggesting that larger audit committees might be linked to lower scale efficiency in turnover, but the effect is not strong enough to be conclusive. Similarly, Audit Committee Independence (ACI) (-0.06, p = 0.120) does not have a statistically significant relationship with SEt, implying that the independence of audit committees does not strongly impact firms' turnover-based efficiency.

Among the control variables, Firm Size (FS) (1.62, p = 0.404) is positively associated with SEt but remains statistically insignificant. However, leverage (LEV) (-0.02, p = 0.003) is significant at the 1% level, confirming that highly leveraged firms experience reduced turnover efficiency. The F-value (3.00, p = 0.007) indicates that the model is statistically significant, though the R-square value (0.0419) is low, implying that only about 4.2% of the variations in SEt are explained by the independent variables. Diagnostic tests indicate that the Breusch-Pagan LM Test (357.37, p = 0.000)* confirms that a panel data model is appropriate, while the Hausman Test (275.42, p = 0.000)* suggests that the fixed effects model is preferred. The Portmanteau Test (45.00, p = 0.4720) indicates no significant serial correlation in the residuals, while the Ramsey RESET Test (14.44, p = 0.000)* suggests possible model specification errors. For Model 2, which examines Scale Efficiency based on Assets (SEa), the constant term (-12.03, p = 0.070) is marginally insignificant, indicating a possible negative base level of efficiency in asset utilization. Audit Committee Size (ACS) (-1.91, p = 0.050) is statistically significant at the 5% level, confirming a negative impact on SEa, meaning that firms with larger audit committees tend to have lower asset efficiency. Audit Committee Independence (ACI) (-0.03, p = 0.331) remains statistically insignificant, reinforcing the finding that independent audit committees do not significantly influence asset utilization efficiency.

Among the control variables, Firm Size (FS) (0.32, p = 0.852) remains insignificant, showing no strong association with SEa. However, leverage (LEV) (-0.11, p = 0.000)* is highly significant at the 0.1% level, reinforcing that higher debt levels negatively impact asset efficiency. The F-value (43.25, p = 0.000)* indicates that Model 2 is statistically significant, and the R-square (0.358) suggests that about 35.8% of the variation in SEa is explained by the independent variables, making this model notably stronger than Model 1. The Breusch-Pagan LM Test (2414.22, p = 0.000)* confirms the need for a panel data approach, and the Hausman Test (118.99, p = 0.000)* supports the fixed effects model. The Portmanteau Test (46.74, p = 0.483) suggests no significant serial correlation, while the Ramsey RESET Test (73.21, p = 0.000)* signals potential model misspecification. Additionally, the heteroskedasticity test (p = 0.000)* confirms the presence of heteroskedasticity, necessitating robust standard errors for reliable interpretation.

Discussion of Findings

The analysis in this study employs the robust fixed effects regression model (Model 2) to investigate the relationship between audit committee effectiveness and corporate financial performance among listed manufacturing firms in Nigeria. This model is particularly appropriate for panel data structures where individual firms are observed over multiple years (2012–2022), and it accounts for unobservable heterogeneity that may exist across firms. The fixed effects approach controls for time-invariant characteristics within each firm that could bias the estimation of relationships among variables. For instance, inherent differences in corporate culture, strategic orientation, or board governance traditions that do not change over time are effectively neutralized. In addition, robust standard errors are used to correct for any heteroskedasticity or serial correlation in the panel dataset, thereby enhancing the reliability and validity of the estimated coefficients.

The choice of the fixed effects model is justified by the outcome of the Hausman test, which indicated that the fixed effects model is more consistent and efficient than the random effects alternative for the given dataset. Furthermore, the robustness adjustment ensures that statistical inferences remain valid even when standard assumptions about error terms are violated. This modelling approach provides a rigorous empirical framework for isolating the effect of audit committee size, independence, gender diversity, and diligence on scale efficiency and cost discipline—two critical dimensions of corporate financial performance.

Audit Committee Size

Using the robust fixed effects regression model, the analysis reveals that Audit Committee Size has a negative and statistically significant effect on Scale Efficiency based on Assets (SEa), with a coefficient of –1.91 and a p-value of 0.050. This implies that, holding other factors constant, a unit increase in audit committee size is associated with a decrease in asset-based efficiency. In contrast, the relationship between Audit Committee Size and Scale Efficiency based on Turnover (SEt) remains negative but statistically insignificant (coefficient = –1.63, p = 0.138), indicating no strong empirical support for its impact on turnover-related efficiency. These findings suggest that while the presence of a larger audit committee may enhance monitoring capacity, it may also result in bureaucratic inefficiencies that impede effective asset utilization. This aligns with the theoretical expectation under the agency theory framework, where excessive size can lead to coordination difficulties and diluted responsibility, thus undermining swift and effective oversight. Empirical evidence from prior studies supports this interpretation. For instance, Bala and Sule (2021) found that excessively large audit committees in Nigerian manufacturing firms were linked with lower operational efficiency due to protracted decision-making. Similarly, Ibrahim et al. (2021) emphasized that overly large committees could reduce accountability and weaken governance structures. Babatunde et al. (2021) observed that audit committees exceeding seven members often experienced delays in strategic response, further constraining operational performance.

However, contrary perspectives exist in the literature. Hassan et al. (2021) reported a positive and significant association between audit committee size and financial performance, suggesting that larger committees improve oversight by leveraging broader expertise. Adegbite and Olaniran (2019) found similar results in the Nigerian context, emphasizing that diversity in large committees supports better resource management. Farhan et al. (2020) also noted that firms with more sizable audit committees benefited from stronger internal controls and enhanced operational decision-making. These contrasting findings indicate that the effect of audit committee size on performance may be contingent upon institutional context and governance practices. In environments with weaker regulatory enforcement—such as Nigeria—larger committees may exacerbate inefficiencies rather than mitigate them. The robust fixed effects regression results from this study reinforce the notion that audit committee size must be optimized rather than maximized to enhance asset efficiency without introducing unnecessary delays or complexity into governance processes.

In summary, this study extends the literature by providing panel-based evidence that underscores the negative effect of excessive audit committee size on asset-based scale efficiency in Nigerian manufacturing firms. It emphasizes the importance of achieving a balance between oversight capacity and functional effectiveness in governance structures

Audit Committee Independence

Based on the robust fixed effects regression model, the study finds that Audit Committee Independence exerts a negative but statistically insignificant effect on both Scale Efficiency based on Turnover (SEt) (coefficient = –0.06, p = 0.120) and Scale Efficiency based on Assets (SEa) (coefficient = –0.03, p = 0.331). These results suggest that a higher proportion of independent members on the audit committee does not significantly influence the operational efficiency of Nigerian manufacturing firms.

This finding is theoretically consistent with agency theory, which posits that independent directors enhance oversight and reduce agency conflicts. However, in practice—particularly within weak institutional environments—this oversight may not effectively translate into improved efficiency metrics. In Nigeria, the limited impact observed could stem from several context-specific issues, such as the ceremonial nature of independence in some firms, inadequate financial expertise among independent directors, and inconsistent enforcement of governance codes.

Empirical studies reinforce this interpretation. For example, Adewole et al. (2020) reported a weak positive but insignificant relationship between audit committee independence and operational performance, emphasizing the need to complement independence with professional competence. Hassan et al. (2019) similarly found that independent directors in well-governed firms may offer limited incremental value if the governance structures are already sound. These findings echo the notion that independence, while desirable, is not inherently sufficient to drive improvements in efficiency. Contrarily, other scholars have found significant benefits associated with audit committee independence. Hassan et al. (2021) observed that greater independence improved financial discipline and resource allocation. Adegbite and Olaniran (2019) documented enhanced operational efficiency in firms with more independent audit committees, attributing the result to stronger monitoring mechanisms. Khan et al. (2022) also highlighted the role of audit committee independence in mitigating financial risk, which indirectly supports efficiency gains. The divergence in findings highlights that the effectiveness of audit committee independence is not universal but rather contingent on specific firm- and country-level governance dynamics. For Nigerian manufacturing firms, the lack of significance may reflect the limited influence of independent directors on day-to-day operations or a mismatch between formal governance structures and actual boardroom practices. Moreover, regulatory weaknesses and low enforcement intensity in Nigeria's corporate governance framework may further limit the influence of independence on operational outcomes.

This study contributes to the literature by offering a nuanced view of audit committee independence through the lens of scale efficiency, a performance measure often overlooked in favour of profitability. By focusing on resource utilization rather than financial returns alone, the findings provide a deeper understanding of how governance structures operate in practice. The results suggest that independence, while conceptually important, must be coupled with technical expertise, strategic engagement, and a supportive regulatory environment to be effective in driving firm efficiency.

5. Conclusion and Recommendations

This study employed a robust fixed effects regression model to examine the influence of audit committee effectiveness on corporate financial performance, measured by scale efficiency in Nigerian manufacturing firms. The results indicate that Audit Committee Size has a statistically significant negative effect on Scale Efficiency based on Assets, suggesting that overly large committees may hinder operational efficiency due to coordination challenges and bureaucratic delays. In contrast, Audit Committee Independence showed no significant relationship with either measure of scale efficiency, implying that structural independence alone does not necessarily enhance resource optimization in the absence of strong regulatory enforcement and relevant expertise.

Based on these findings, firms are encouraged to maintain moderately sized audit committees that promote efficient decision-making without sacrificing diversity of opinions. Additionally, emphasis should be placed on appointing independent members with relevant financial and industry expertise to ensure their contributions translate into improved oversight and performance. Regulators should strengthen qualification criteria for independent directors and support continuous training to enhance the functional effectiveness of audit committees in driving financial sustainability.

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