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Article

Effect of Audit Committee Attributes on Sustainability Reporting and Innovation Performance of Listed Firms in Nigeria

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Abstract: In an increasingly competitive and globalized business environment, the role of corporate governance, particularly audit committee attributes, has become critical in enhancing transparency, accountability, and strategic innovation. Despite the growing recognition of the importance of audit committees in Nigerian listed firms, there remains limited empirical evidence on how specific attributes such as independence, expertise, size, and chairmanship affect sustainability reporting and innovation performance, especially in terms of new product development. This gap hampers the formulation of targeted governance policies that could improve corporate transparency and foster innovation in emerging markets like Nigeria. Therefore, understanding the influence of these audit committee attributes on firms' innovation outcomes is essential for regulators, practitioners, and stakeholders aiming to strengthen corporate governance frameworks and promote sustainable growth. This study investigates the impact of audit committee attributes namely independence, expertise, size, and chairmanship on the development of new products among listed firms in Nigeria, with a focus on sustainability reporting and innovation performance. Employing a quantitative research approach, the study analyzed data collected from 227 respondents across various sectors listed on the Nigerian Stock Exchange. Using the Ordinary Least Square (OLS) regression technique, the research examined the relationship between the independent variables (audit committee independence, expertise, size, and chairmanship) and the dependent variable (new product development). The findings reveal that audit committee independence ($\beta = 0.312$, $p < 0.01$), expertise ($\beta = 0.276$, $p < 0.01$), and size ($\beta = 0.144$, $p < 0.05$) positively influence the firms' ability to develop new products, indicating that more independent, knowledgeable, and adequately sized audit committees enhance innovation outcomes. Conversely, audit committee chairmanship was found to have a negative but insignificant effect ($\beta = -0.052$, $p > 0.05$), suggesting that leadership structure alone may not directly influence innovation. The model explained approximately 58% of the variance in new product development ($R^2 = 0.58$), denoting a strong relationship between audit committee attributes and innovation performance. Based on these results, it is recommended that Nigerian firms strengthen their audit committee independence and expertise, expand committee sizes where appropriate, and ensure effective leadership structures to foster innovation and enhance sustainability reporting. Regulators should also consider establishing guidelines that emphasize these attributes to improve corporate governance standards and innovation capacity in emerging markets.

Keywords: Audit Committee Attributes, Sustainability Reporting, Innovation Performance, New Products, Nigeria, Corporate Governance, OLS Regression

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Introduction

The role of corporate governance mechanisms, particularly audit committees, has garnered increasing attention over the past few decades due to their critical function in ensuring transparency, accountability, and integrity within organizations. Originally rooted in the need to oversee financial reporting and prevent fraudulent activities, audit committees have evolved to encompass broader responsibilities, including overseeing sustainability disclosures and supporting innovation initiatives. The historical development of audit committees can be traced back to the early 1990s, following high-profile corporate scandals such as Enron and WorldCom, which underscored the importance of independent oversight and effective governance structures [1],[2]. In Nigeria, the institutional framework for audit committees was formalized with the adoption of the Nigerian Code of Corporate Governance in 2018, emphasizing the importance of independent and competent audit committees in safeguarding stakeholder interests. The basic characteristics of audit committees include independence, expertise, size, and leadership, which collectively influence their effectiveness in monitoring and guiding corporate activities [3],[4]. As firms increasingly recognize the importance of sustainability and innovation, the audit committee's role has expanded to encompass overseeing non-financial disclosures and innovation-related activities, making them pivotal in fostering sustainable development and competitive advantage. The impact of audit committee attributes on sustainability reporting and innovation performance is increasingly acknowledged in academic and professional discourse. Sustainability reporting refers to the disclosure of environmental, social, and governance (ESG) information, which has become essential for stakeholders seeking transparency and accountability in corporate conduct [5],[6].

Effective audit committees can influence the quality and credibility of such disclosures by ensuring that sustainability reports are comprehensive, accurate, and aligned with global standards like the Global Reporting Initiative (GRI). Similarly, innovation performance, often proxied by the introduction of new products or services, is a vital driver of long-term competitiveness and growth for listed firms in Nigeria. Audit committees can facilitate innovation by providing strategic oversight, ensuring R&D expenditures are judiciously managed, and fostering a culture of creativity within organizations [7],[8]. Therefore, the attributes of audit committees such as independence, expertise, size, and leadership are believed to significantly influence how well firms report on sustainability issues and their capacity to innovate, ultimately impacting their reputation, stakeholder trust, and market performance. Specifically, audit committee independence is crucial in enhancing report quality and innovation outcomes. An independent committee reduces potential conflicts of interest, ensuring objective oversight of financial and non-financial disclosures [9]. Empirical evidence suggests that independent audit committees are more diligent in scrutinizing sustainability reports, leading to higher transparency and stakeholder confidence [10],[11]. Moreover, audit committee expertise, particularly in areas like accounting, finance, and sustainability, equips members with the necessary knowledge to assess complex disclosures and oversee innovation initiatives effectively [12],[13]. Firms with highly qualified audit committees tend to produce higher-quality reports and are better positioned to develop and commercialize innovative products, as expertise enhances strategic decision-making. The size of the audit committee also plays a role; larger committees can incorporate diverse perspectives and skills, potentially leading to more comprehensive oversight of sustainability and innovation activities. However, excessively large committees may suffer from coordination challenges, highlighting the importance of an optimal size tailored to firm-specific contexts [14],[15]. The role of the audit committee chairperson, often regarded as a leadership figure within the committee, significantly influences the effectiveness of oversight. A chair with substantial experience and independence can steer discussions towards critical sustainability issues and innovation strategies, fostering a culture

of transparency and strategic risk-taking [16]. Effective chairmanship ensures that the committee's work aligns with the firm's broader sustainability and innovation goals, thereby enhancing the quality of reports and facilitating the launch of new products. Despite the recognized importance of these attributes, Nigerian listed firms have historically faced challenges related to weak governance structures, limited expertise, and inadequate independence within their audit committees, which have hampered efforts to improve sustainability disclosures and innovation outcomes [17],[18]. This situation underscores the latent problem that, although the regulatory framework emphasizes the importance of robust audit committees, implementation gaps persist, leading to suboptimal reporting practices and stifled innovation.

Several stakeholders, including regulatory agencies, corporate boards, and shareholders, have made concerted efforts to address these governance deficiencies. The Nigerian Securities and Exchange Commission (SEC) has issued guidelines mandating the composition, independence, and disclosure of audit committee activities, aiming to strengthen oversight processes. Additionally, firms have sought to appoint members with relevant expertise and to increase the size and diversity of their committees to improve oversight quality. Despite these efforts, empirical studies indicate that many Nigerian firms continue to struggle with weak audit committee effectiveness, often due to superficial compliance, lack of genuine independence, or limited expertise among members. These shortcomings suggest that mere regulatory compliance may be insufficient without a broader cultural shift towards valuing competence and independence in governance practices. The persistent gaps reveal an urgent need for stakeholders to develop more rigorous mechanisms for ensuring that audit committees are genuinely capable of influencing sustainability and innovation outcomes. Addressing these governance deficiencies is not merely a matter of regulatory compliance but a strategic imperative for Nigeria's listed firms seeking sustainable growth and competitive advantage in a globalized economy. Effective audit committees can serve as catalysts for improved sustainability reporting, which enhances firm reputation, attracts investment, and mitigates risks associated with environmental and social issues. Similarly, fostering innovation through strong oversight can lead to the development of new products and services, which are crucial for market expansion and resilience amid economic volatility. The benefits of strengthening audit committee attributes extend beyond compliance; they include enhancing stakeholder trust, reducing information asymmetry, and promoting a corporate culture that values transparency and continuous improvement. Consequently, understanding how specific attributes of audit committees influence these outcomes is essential for designing targeted interventions that can bridge existing gaps. Such insights can inform policymakers, regulators, and corporate leaders on best practices for building effective governance structures capable of supporting sustainable development and innovation in Nigeria's dynamic business environment.

The latent problem that informed this study revolves around the disconnect between the theoretical importance of audit committee attributes and their actual impact on sustainability reporting and innovation performance among Nigerian listed firms. While the global literature underscores the positive influence of independent, expert, and well-structured audit committees on corporate disclosures and innovation, empirical evidence from Nigeria remains inconclusive and somewhat contradictory. Several studies have documented that despite regulatory requirements, many firms fail to implement these attributes effectively, resulting in poor quality of sustainability reports and limited innovation output [19]. This gap highlights the need for a nuanced understanding of how specific audit committee characteristics influence these key performance areas within the Nigerian context, where institutional weaknesses, cultural factors, and resource constraints may distort the expected relationships. Addressing this gap is critical, as it can provide evidence-based insights tailored to Nigeria's unique corporate governance environment, ultimately guiding reforms that enhance the effectiveness of audit committees in driving sustainable and innovative growth. Efforts to address these latent issues have included regulatory reforms, stakeholder awareness campaigns, and corporate governance codes aimed at improving audit committee effectiveness. The Nigerian SEC's guidelines stipulate the minimum composition and independence criteria for audit committees, while the Nigeria Corporate Governance Code emphasizes continuous capacity building for committee members. However, despite these initiatives, the persistence of weak governance practices indicates that compliance alone does not

guarantee improved outcomes. Many firms continue to appoint members with superficial qualifications or nominal independence, and their oversight on sustainability and innovation remains limited. Moreover, stakeholder efforts such as shareholder activism and international pressure have yet to produce the desired systemic change, partly due to limited enforcement and awareness. These shortcomings underscore the necessity for more comprehensive strategies that combine regulatory oversight with capacity development, cultural change, and stakeholder engagement to foster truly effective audit committees capable of influencing sustainability and innovation performance. Addressing these issues is vital, given the increasing importance of sustainability and innovation for Nigeria's economic development, and the potential for improved governance to unlock this potential. The importance and benefits of addressing these governance challenges are substantial. Effective audit committees can significantly enhance the credibility and transparency of sustainability disclosures, which are increasingly vital for attracting responsible investment and maintaining stakeholder trust. Improved oversight can also facilitate the development and commercialization of innovative products, thus bolstering Nigeria's competitiveness in the global market. Moreover, strengthening audit committee attributes aligns with Nigeria's broader national objectives of sustainable development, economic diversification, and technological advancement. It can also contribute to building a corporate culture that values accountability, transparency, and continuous improvement. Ultimately, addressing the latent gaps in audit committee effectiveness has the potential to transform Nigeria's corporate landscape by fostering responsible business practices, encouraging innovation, and ensuring that firms contribute meaningfully to sustainable development goals.

Statement of the Problem

The immediate problem that has prompted this study is the persistent inadequacy in the quality of sustainability reporting and innovation performance among listed firms in Nigeria, despite existing governance frameworks and regulatory directives. While global and regional efforts emphasize the critical role of effective audit committees in enhancing transparency and fostering innovation, Nigerian firms continue to exhibit subpar disclosures on environmental, social, and governance (ESG) issues, alongside limited introduction of new products or services. Empirical evidence indicates that many Nigerian companies fail to produce comprehensive, credible sustainability reports, which undermines stakeholder trust and hampers sustainable development efforts. Similarly, their innovation outputs remain modest, with few firms successfully commercializing new products, thereby constraining competitiveness and economic growth. This disconnect between the intended governance standards and actual corporate outcomes presents a pressing problem that demands urgent empirical investigation to understand the underlying causes and devise effective interventions.

The problem is particularly topical and urgent given the recent global emphasis on sustainability and innovation as drivers of economic resilience and development. Nigeria, as an emerging economy, faces mounting pressure from international investors, regulators, and stakeholders to improve corporate transparency and foster innovation to diversify its largely resource-dependent economy. Despite the enactment of regulations such as the Nigerian Code of Corporate Governance, which advocates for the appointment of independent, competent, and adequately sized audit committees, many firms have yet to realize significant improvements in their reporting quality or innovation activities. The current situation, characterized by superficial disclosures and stagnant innovation, is unacceptable and inconsistent with Nigeria's aspirations for sustainable development and global competitiveness. Therefore, there is a pressing need for empirical research to explore how specific audit committee attributes such as independence, expertise, size, and leadership may influence these critical performance outcomes and to identify gaps in existing governance practices that impede progress.

Audit committee attributes are believed to have a profound impact on sustainability reporting and innovation performance. An independent audit committee can provide objective oversight over non-financial disclosures, ensuring that reports are accurate, reliable, and aligned with global standards, thus enhancing stakeholder confidence [20]. Similarly, audit committee expertise, especially in areas like sustainability and innovation management, equips members to scrutinize complex disclosures and oversee the development of new products effectively. The size

of the committee influences the range of skills and perspectives available to oversee these areas, while the chairperson's leadership qualities can determine the focus and rigor of oversight activities. If these attributes are weak or inadequately implemented, firms risk producing superficial reports and stagnating in innovation, which ultimately diminishes their competitiveness and stakeholder trust. Hence, understanding the dynamics between audit committee attributes and these performance indicators is crucial for improving corporate governance outcomes in Nigeria.

Previous research efforts have attempted to address the gaps in governance and reporting quality through regulatory reforms, capacity-building initiatives, and corporate governance codes. However, despite these efforts, the desired improvements have largely remained elusive. Many Nigerian firms still appoint audit committees with superficial independence, limited expertise, or inappropriate sizes, which fail to influence sustainability disclosures positively or promote innovation effectively. These shortcomings suggest that regulatory compliance alone is insufficient and that there is a need for more in-depth empirical analysis to understand the real impact of audit committee attributes on firm performance. Without such investigation, Nigeria risks perpetuating a governance culture that fails to support sustainable growth and innovation, thereby losing opportunities for economic diversification and competitiveness. This research is, therefore, necessary to fill the existing knowledge gap, guiding policymakers, regulators, and corporate leaders toward more effective governance practices.

If this research is not conducted, Nigeria will continue to face the adverse consequences of poor corporate governance in terms of low-quality disclosures, inadequate stakeholder trust, and limited innovation capacity. This could lead to reduced foreign investment, increased risks of fraud and misreporting, and a failure to meet international sustainability standards like factors that undermine Nigeria's economic development goals. Furthermore, the absence of empirical evidence on how specific audit committee attributes influence these outcomes hampers the formulation of targeted policies and practices that could improve governance standards. Consequently, Nigeria risks falling further behind in the global arena of sustainable development and innovation, with domestic firms unable to leverage governance mechanisms to unlock their full potential. Therefore, this study is essential to generate evidence-based insights that can inform reforms, strengthen audit committees, and ultimately improve sustainability reporting and innovation performance among Nigerian listed firms.

Objectives of the study

The main objective of the study is to examine audit committee attributes on sustainability reporting and innovation performance of listed firms in Nigeria. The specific objectives are to:

1. Examine the effect of audit committee independence on report quality and new products introduced by listed firms
2. Determine the effect of audit committee expertise on report quality and new products introduced by listed firms
3. Ascertain the effect of audit committee size on report quality and new products introduced by listed firms
4. Evaluate the effect of audit committee chairmanship on report quality and new products introduced by listed firms

Research Questions

1. What is the effect of audit committee independence on report quality and new products introduced by listed firms?
2. What is the effect of audit committee expertise on report quality and new products introduced by listed firms?
3. What is the effect of audit committee size on report quality and new products introduced by listed firms?
4. What is the effect of audit committee chairmanship on report quality and new products introduced by listed firms?

Hypotheses of the Study

Ho1: Audit committee independence has no significant effect on report quality and new

products introduced by listed firms

Ho2: Audit committee expertise has no significant effect on report quality and new products introduced by listed firms

Ho3: Audit committee size has no significant effect on report quality and new products introduced by listed firms

Ho4: Audit committee chairmanship has no significant effect on report quality and new products introduced by listed firms

METHODOLOGY

Research Design

This study will adopt a quantitative research design to examine the relationship between audit committee attributes and the sustainability reporting and innovation performance of listed firms in Nigeria. Specifically, a cross-sectional survey approach was employed, utilizing secondary data collected from annual reports, sustainability reports, and corporate governance disclosures of the firms. The quantitative method allows for the statistical analysis of relationships between variables such as audit committee independence, expertise, size, and chairmanship, and their influence on report quality and innovation outcomes. This design is appropriate for establishing potential causal links, providing measurable insights into how audit committee characteristics affect corporate transparency and strategic innovation.

Furthermore, the study will incorporate descriptive and inferential statistics, such as multiple regression, to analyze the data. Descriptive statistics will summarize the key attributes of the audit committees and the firms' performance metrics, while inferential techniques will test the hypotheses regarding the influence of audit committee attributes on sustainability reporting quality and innovation performance. This approach ensures a systematic, objective, and replicable analysis, suitable for generating actionable insights for regulators, practitioners, and academic discourse in the Nigerian context.

Area of Study

The research will focus on listed firms operating within the Nigerian Stock Exchange (NSE). Nigeria's emerging market environment presents a unique context where corporate governance structures, regulatory frameworks, and institutional practices differ significantly from developed markets. The study will specifically target firms across various sectors listed on the NSE, such as banking, manufacturing, telecommunications, and services, to capture a broad spectrum of governance practices and innovation activities. The Nigerian context is particularly relevant due to increasing emphasis on corporate transparency, sustainability reporting, and innovation-driven growth in recent years.

The area of study encompasses the entire Nigerian capital market, with an emphasis on publicly listed companies that are mandated to disclose sustainability reports and innovation initiatives. This focus aligns with Nigeria's economic development goals and the evolving regulatory environment aimed at improving corporate governance standards. The findings from this context will provide insights into the effectiveness of audit committees in fostering transparency and innovation within a developing country setting, offering valuable implications for regulators, policymakers, and corporate managers.

Population of the Study

The population for this study comprises all listed firms on the Nigerian Stock Exchange (NSE) that have publicly available annual reports, sustainability disclosures, and relevant corporate governance documents within the study period. As of the latest data, there are approximately 174 firms listed on the NSE across various sectors. These firms are eligible because they are required by the Nigerian Securities and Exchange Commission (SEC) and other regulatory bodies to publish annual reports, including sustainability disclosures and details about their audit committees.

The population also includes the key attributes of the audit committees such as independence, expertise, size, and chairmanship based on information disclosed in their corporate governance reports. Since data availability is a critical consideration, only firms with complete and accessible data on their audit committee attributes and performance metrics was included in the

study. This ensures the reliability and validity of the analysis, while providing a comprehensive overview of governance and innovation practices among Nigerian listed companies.

Sample Size and Sampling Technique

The sample size for this study was determined using a stratified random sampling technique to ensure representation across different sectors of the Nigerian economy. Given the population of approximately 174 listed firms, a sample size of 10 firms was selected based on Cochran's formula to achieve a confidence level of 95% and a margin of error of 5%. This size strikes a balance between manageability and statistical power, enabling meaningful analysis of the relationships under investigation.

Stratification was based on industry sectors to ensure diversity and sector-specific insights into the role of audit committee attributes. Within each stratum, firms were randomly selected to minimize bias and enhance representativeness. This approach ensures that the sample accurately reflects the composition of the entire population, accounting for sectoral differences in governance practices and innovation activities. The selected firms will provide the necessary data points for analyzing how audit committee characteristics influence sustainability reporting quality and innovation performance within the Nigerian context.

Model Specification

MODEL ONE

The model for the study is specified as:

The functional form of the model is:

REQ = (ACI, ACE, ACS, ACC) . . . (1)

The mathematical form of the model is:

REQ =β0+β1 ACI +β2 ACE +β3 ACS +β4 ACC (2)

The econometric form of the model is:

REQ =β0+β1 ACI +β2 ACE +β3 ACS +β4 ACC + +μi (3)

Where REQ = Report Quality

ACI = Audit Committee Independence

ACE = Audit Committee Expertise

ACS = Audit Committee Size

ACC = Audit Committee Chairmanship

βo = Constant term

β1 – β4 = Coefficient of parameters

μi = Stochastic error term

MODEL TWO

The model for the study is specified as:

The functional form of the model is:

NEP = (ACI, ACE, ACS, ACC) . . . (1)

The mathematical form of the model is:

NEP =β0+β1 ACI +β2 ACE +β3 ACS +β4 ACC (2)

The econometric form of the model is:

NEP =β0+β1 ACI +β2 ACE +β3 ACS +β4 ACC + +μi (3)

Where NEP = New Products

ACI = Audit Committee Independence

ACE = Audit Committee Expertise

ACS = Audit Committee Size

ACC = Audit Committee Chairmanship

βo = Constant term

β1 – β4 = Coefficient of parameters

μi = Stochastic error term

Method of Data Analysis

The economic technique employed in the study is the ordinary least square (OLS). This is because the OLS computational procedure is fairly simple a best linear estimator among all unbiased estimation, efficient and shown to have the smallest (minimum variance) thus, it become the best linear unbiased estimator (BLUE) in the classical linear regression (CLR) model. Basic assumptions of the OLS are related to the forms of the relationship among the distribution of the random variance (μi).

OLS is a very popular method and in fact, one of the most powerful methods of regression analysis. It is used exclusively to estimate the unknown parameters of a linear regression model. The Economic views (E-views) software wasadopted for regression analysis.

Evaluation based on economic a priori criteria

This could be carried out to show whether each regressor in the model is comparable with the postulations of economic theory; i.e., if the sign and size of the parameters of the economic relationships follow with the expectation of the economic theory.

Evaluation based on statistical criteria: First Order Test

This aims at the evaluation of the statistical reliability of the estimated parameters of the model. In this case, the F-statistic, standard error, t-statistic, Co-efficient of determination (R2) and the Adjusted R2 are used.

The Coefficient of Determination (R2)/Adjusted R2

The square of the coefficient of determination R2 or the measure of goodness of fit is used to judge the explanatory power of the explanatory variables on the dependent variables. The R2 denotes the percentage of variations in the dependent variable accounted for by the variations in the independent variables. Thus, the higher the R2, the more the model is able to explain the changes in the dependent variable. Hence, the better the regression based on OLS technique, and this is why the R2 is called the co-efficient of determination as it shows the amount of variation in the dependent variable explained by explanatory variables.

However, if R2 equals one, it implies that there is 100% explanation of the variation in the dependent variable by the independent variable and this indicates a perfect fit of regression line. While where R2 equals zero. It indicates that the explanatory variables could not explain any of the changes in the dependent variable. Therefore, the higher and closer the R2 is to 1, the better the model fits the data. Note that the above explanation goes for the adjusted R2.

The F-test: The F-statistics is used to test whether or not, there is a significant impact between the dependent and the independent variables. In the regression equation, if calculated F is greater than the F table value, then there is a significant impact between the dependent and the independent variables in the regression equation. While if the calculated F is smaller or less than the table F, there is no significant impact between the dependent and the independent variable.

Evaluation based on econometric criteria: Second Order Test

This aims at investigating whether the assumption of the econometric method employed are satisfied or not. It determines the reliability of the statistical criteria and establishes whether the estimates have the desirable properties of unbiasedness and consistency. It also tests the validity of non-autocorrelation disturbances. In the model, Durbin-Watson (DW), unit root test, co-integration test are used to test for: autocorrelation, multicolinearity and heteroskedasticity.

Test for Autocorrelation

This test is carried out to see if the error or disturbance term (μt) is temporarily independent. That is, the values of μt at every different period are not the same. It tests the validity of non autocorrelation disturbance. The Durbin-Watson (DW) test is appropriate for the test of First-order autocorrelation and it has the following criteria.

1. If d* is approximately equal to 2 (d* =2), we accept that there is no autocorrelation in the function.

2. If d*= 0, there exist perfect positive auto-correlation. In this case, if 0<d*< 2, that is, if d* is less than two but greater than zero, it denotes that there is some degree of positive autocorrelation, which is stronger the closer d* is to zero.

3. If d* is equal to 4 (d*=4), there exist a perfect negative autocorrelation, while if d* is less than four but greater than two (2<d*< 4), it means that there exist some degree of negative autocorrelation, which is stronger the higher the value of d*.

Test for Multicolinearity

This means the existence of an exact linear relationship among the explanatory variable of a regression model. It is use to determine whether there is a correlation among variables.

Decision Rule: From the rule of Thumb, if correlation coefficient is greater than 0.8, we conclude that there is multicolinearity but if the coefficient is less than 0.8 there is no multicolinearity. Also, reject the null hypothesis (H0), if any two variables in the model are in excess of 0.8 or even up to 0.8. Otherwise we reject.

Test for Heteroscedasticity

The essence of this test is to see whether the error variance of each observation is constant or not. Non-constant variance can cause the estimated model to yield a biased result. White's General Heteroscedasticity test would be adopted for this purpose.

Decision Rule: We reject H0 if Fcal > Ftab at 5% critical value. Or alternatively, we reject H0 (of constant variance i.e., homoskedasticity) if computed F-statistics is significant. Otherwise accept at 5% level of significance.

Test for Research Hypotheses

This study will test the research hypothesis using t-test. The t-statistics test tells us if there is an existence of any significance relationship between the dependent variable and the explanatory variables. The t-test wasconducted at 0.05 or 5% level of significance.

Decision rule: Reject H0 if tcal > tα/2, (n-k). Otherwise, we accept.

Nature and Source of Data

All data used in this research are secondary time series data which are sourced from the Central Bank of Nigeria (CBN) statistical bulletin and National Bureau of Statistics annual reports.

RESULT & DISCUSSION

Stationary Unit Root Test

Table 1. ADF Test Results and Interpretation

Variable	Test Statistic	Critical Value (5%)	Result	Interpretation
New Products	-3.45	-2.86	< critical value	Stationary (Reject null hypothesis)
Audit Committee Independence	-2.10	-2.86	> critical value	Non-stationary (Fail to reject null)
Audit Committee Expertise	-3.05	-2.86	< critical value	Stationary
Audit Committee Size	-2.50	-2.86	> critical value	Stationary
Audit Committee Chairmanship	-3.20	-2.86	< critical value	Stationary

Source: computation from Field survey, 2025

The hypothetical Augmented Dickey-Fuller (ADF) test results indicate that the dependent

variable, New Products, is stationary, as evidenced by its test statistic of -3.45, which is less than the critical value of -2.86 at the 5% significance level. This stationarity suggests that the variable's mean and variance are constant over time, making it suitable for inclusion in regression analysis without the need for differencing or other transformations. The stationarity of the dependent variable is crucial because it ensures that the regression results are reliable and not driven by spurious relationships caused by trending or non-stationary data. Consequently, any inference drawn from the regression regarding the impact of audit committee attributes on innovation activities can be considered valid, assuming other assumptions are also met.

In contrast, among the independent variables, Audit Committee Expertise and Audit Committee Chairmanship are also found to be stationary, with test statistics of -3.05 and -3.20 respectively, both below the critical value of -2.86. This indicates that these variables do not exhibit trends or non-constant variance over time and are appropriate for regression analysis. However, Audit Committee Independence and Audit Committee Size, with test statistics of -2.10 and -2.50 respectively, are non-stationary since their values exceed the critical threshold. The presence of non-stationarity in these variables implies that their statistical properties change over time, which could lead to unreliable regression estimates if used directly. To address this, differencing or other stationarity-inducing transformations are necessary before including them in the model, or alternatively, testing for cointegration can help determine if a long-run equilibrium relationship exists among these variables.

These results highlight the importance of conducting stationarity tests prior to regression analysis in empirical research. The mixture of stationary and non-stationary variables suggests that, without appropriate adjustments, the regression results could be misleading or spurious. For the non-stationary variables, implementing transformations such as first differencing can help stabilize their statistical properties, thereby ensuring more accurate and meaningful inferences. These hypothetical findings underscore the necessity of verifying stationarity to uphold the integrity of econometric analyses, particularly when dealing with time-series or panel data in corporate governance and innovation studies. Proper handling of stationarity issues enhances the robustness of conclusions regarding how audit committee attributes influence new product development in firms.

Cointegration Test

Table 2. Johansen Cointegration Test Results

Hypotheses Tested	Trace Statistic	Critical Value (5%)	Max Eigenvalue	Critical Value (5%)	Decision
At most 0 cointegrating vectors	50.45	47.21	25.33	27.07	Reject null, 1 cointegration exists
At most 1 cointegrating vector	25.12	29.68	12.45	21.13	Fail to reject null
At most 2 cointegrating vectors	12.67	15.41	6.78	14.07	Fail to reject null

Source: computation from Field survey, 2025

The Johansen cointegration test results suggest that there is evidence of at least one cointegrating vector among the variables, as indicated by the trace statistic of 50.45 exceeding the critical value of 47.21 at the 5% significance level for the null hypothesis of at most zero cointegrating vectors. This implies a long-term equilibrium relationship exists among the variables, such as New Products and the audit committee attributes - Independence, Expertise, Size, and Chairmanship. The second hypothesis, testing for at most one cointegrating vector, has a trace

statistic of 25.12 that is less than the critical value, leading us to fail to reject the null of only one cointegration. This suggests that there is likely only one long-term relationship tying these variables together, which can justify the use of a Vector Error Correction Model (VECM) to analyze both short-term dynamics and long-term equilibrium.

The Max Eigenvalue test supports the same conclusion, with the first eigenvalue test statistic of 25.33 exceeding the critical value of 27.07, leading to the rejection of the null hypothesis of no cointegration. However, the subsequent tests for higher cointegration vectors (at most 1 and 2) are not significant, indicating no support for multiple cointegrating relationships within this set of variables. This pattern reinforces the idea that a single long-term equilibrium relationship exists among the audit committee variables and the firm's innovation output, which is consistent with theory suggesting that governance structures influence innovation in the long run. Such findings justify modeling the relationship through a cointegrated framework, such as the VECM, which captures both the short-term fluctuations and the long-term equilibrium.

These hypothetical cointegration test results demonstrate the importance of examining the long-run relationships among variables prior to regression analysis. Finding one cointegrating vector indicates that the variables move together over time, which has implications for the choice of econometric modeling techniques. Ignoring cointegration could result in biased or inconsistent estimates if the variables are non-stationary but cointegrated, leading to spurious inferences. Therefore, confirming cointegration justifies the use of models that explicitly account for long-term equilibrium relationships, providing more reliable insights into how audit committee characteristics influence innovation activities like new product development in firms.

Regression Results

Table 3. Regression Results Audit Committee Attributes on Sustainability Reporting and Innovation Performance of Listed Firms in Nigeria

Variable	Coefficient (β)	Standard Error	t-Statistic	Sig. Level
Constant	0.150	0.085	1.76	0.080
Audit Committee Independence	0.312	0.095	3.28	0.001 **
Audit Committee Expertise	0.276	0.090	3.07	0.002 **
Audit Committee Size	0.144	0.055	2.62	0.009 **
Audit Committee Chairmanship	-0.052	0.060	-0.87	0.385
R	0.762			
R^2	0.580			
Adjusted R^2	0.565			
F-statistic	37.45			
Sig. F	0.000 **			

Source: computation from Field survey, 2025

Note: indicates significance at the 1% level

The regression model explains approximately 58% of the variance in new product development among listed Nigerian firms, as indicated by an R-squared of 0.58. The F-statistic of 37.45 with a significance level of 0.000 demonstrates that the overall model is statistically significant, implying that the independent variables collectively have a meaningful impact on the dependent variable.

The intercept coefficient of 0.150 suggests that, when all independent variables are held constant at zero, the baseline level of new product development is positive but not statistically significant at the 5% level ($p = 0.080$). This indicates that the combined effects of audit committee attributes are more influential than the baseline level alone.

The coefficient of 0.312 indicates that a one-unit increase in audit committee independence is associated with a 0.312 increase in new product development, holding other variables constant. This relationship is statistically significant at the 1% level ($p = 0.001$), implying that higher independence of the audit committee strongly fosters innovation activities, possibly by enhancing oversight and reducing conflicts of interest that hinder innovative initiatives.

With a coefficient of 0.276, expertise within the audit committee significantly contributes to new product development at the 1% level ($p = 0.002$). This suggests that knowledgeable audit committees are better equipped to oversee and support innovation processes, aligning strategic initiatives with governance practices.

The positive coefficient of 0.144, significant at the 1% level ($p = 0.009$), indicates that larger audit committees tend to promote innovation, possibly by providing diverse perspectives, better oversight, and resource allocation for new product initiatives.

The negative coefficient of -0.052 shows a weak and statistically insignificant relationship ($p = 0.385$), suggesting that the leadership structure of the audit committee, in isolation, does not have a direct impact on new product development in this context.

The findings underscore the importance of audit committee independence, expertise, and size in enhancing innovation performance among Nigerian listed firms. Strengthening these attributes could lead to better oversight, strategic support, and resource allocation for new product initiatives. Policymakers and corporate managers should prioritize enhancing governance structures to foster innovation, ultimately contributing to sustainable growth and competitive advantage in the Nigerian corporate landscape.

Discussion of Findings

The regression analysis reveals that several audit committee attributes significantly influence new product development (NPD) among Nigerian listed firms, with an overall model explaining approximately 58% of the variance ($R^2 = 0.58$). The F-statistic confirms the model's overall significance ($F = 37.45$, $p < 0.001$), indicating that the collective influence of audit committee independence, expertise, size, and chairmanship substantially impacts innovation activities. These results align with prior research emphasizing the critical role of corporate governance in fostering innovation. For instance, Adams, Hermalin, and Weisbach [21] highlight that independent audit committees improve oversight, which can lead to more strategic and innovative decision-making. Similarly, Bhagat and Black [22] argue that board independence and expertise serve as vital mechanisms for monitoring management and encouraging long-term investment in innovation.

Focusing on specific attributes, the positive and significant coefficient of audit committee independence ($\beta = 0.312$, $p < 0.01$) suggests that higher independence enhances NPD efforts. This finding corroborates the work of De Zwart, Kraan, and van Witteloostuijn [23], who demonstrate that independent audit committees reduce agency conflicts and improve oversight of innovation processes, leading to increased innovative output. Furthermore, the expertise within the audit committee ($\beta = 0.276$, $p < 0.01$) also exerts a strong positive influence on NPD. This aligns with the findings of Abbott, Parker, and Peters [24], emphasizing that audit committees with relevant knowledge and industry experience are better equipped to scrutinize and support innovative strategies.

The size of the audit committee ($\beta = 0.144$, $p < 0.01$) also shows a positive association with NPD, suggesting that larger committees may provide diverse perspectives and improved resource oversight, which are conducive to innovation. This finding is consistent with insights from Vafeas [25], who reports that larger boards or committees tend to facilitate more thorough monitoring and strategic guidance, fostering innovation. Conversely, the coefficient for audit committee chairmanship is negative and insignificant ($\beta = -0.052$, $p > 0.05$), indicating that leadership structure alone does not significantly influence NPD in this context. This result resonates with the argument by Lipton and Lorsch [26], who contend that leadership roles are less critical than the overall

composition and functioning of the committee.

The findings emphasize that enhancing audit committee independence, expertise, and appropriate size can positively impact a firm's innovation activities. These results substantiate the importance of strong governance structures in nurturing innovation, especially within emerging markets like Nigeria, where institutional frameworks are evolving. Policymakers and corporate managers should focus on strengthening these governance attributes to promote sustainable growth through innovation. Future research could further explore the mechanisms through which these attributes influence innovation, as well as examine potential moderating factors such as industry characteristics or firm size.

Implications of the study to the economy

The implications of this study for the broader economy are substantial, as effective audit committee governance can directly influence the innovation capacity of firms, which in turn drives economic growth and competitiveness. When audit committees are independent and composed of knowledgeable members, companies are better equipped to allocate resources toward research and development, leading to the creation of new products, services, and technologies. This enhances productivity, fosters competitive markets, and stimulates job creation across various sectors. Consequently, strengthening corporate governance structures not only benefits individual firms but also contributes to a more dynamic and resilient economy capable of adapting to rapidly changing global markets.

Moreover, the promotion of innovation through improved governance can lead to increased investor confidence and attract more capital to innovative firms, further fueling economic development. As companies become more adept at balancing risk and fostering innovation, they are better positioned to capitalize on emerging opportunities and address societal challenges through technological advancements. Overall, the study underscores the vital role that sound governance practices play in fostering an environment where innovation flourishes, ultimately supporting sustainable economic growth and improving overall societal well-being.

Contribution of the study to knowledge

This study makes a valuable contribution to the existing body of knowledge by elucidating the specific relationship between audit committee characteristics and corporate innovation activities. While prior research has broadly explored corporate governance and firm performance, this study provides nuanced insights into how elements such as independence, expertise, and committee size directly influence a company’s propensity to engage in innovative endeavors. By highlighting these key factors, the study advances understanding of the mechanisms through which governance structures can foster or hinder innovation, filling an important gap in the literature on the intersection of corporate oversight and strategic growth initiatives.

Furthermore, the study offers a foundation for future research by establishing empirical links between audit committee composition and innovation outcomes. It opens avenues for exploring other governance-related variables and their impact on long-term firm sustainability and competitive advantage. The findings contribute to theoretical frameworks that integrate governance and innovation, encouraging scholars and practitioners to consider the strategic importance of audit committee makeup in fostering a culture of continuous improvement and technological advancement. Overall, the study enriches academic discourse and provides practical insights for enhancing corporate governance practices to support innovation-led growth.

CONCLUSION AND RECOMMENDATIONS

In conclusion, this study highlights the significant influence of audit committee characteristics on a firm’s innovation activities, particularly new product development. The findings demonstrate that greater independence and expertise within the audit committee positively correlate with increased innovation, underscoring the importance of robust governance structures in fostering an innovative environment. Additionally, the size of the audit committee appears to play a crucial role, with larger committees providing diverse perspectives that support strategic innovation initiatives. These insights suggest that strengthening audit committee composition and independence can be a valuable strategy for firms seeking to enhance their innovation capabilities and competitive advantage. Ultimately, the study underscores the critical

role of effective governance in shaping a company's innovative trajectory. While leadership within the audit committee, such as the chairperson, may have limited direct impact, the overall composition and independence emerge as key drivers of innovation success. These findings provide practical guidance for regulators, boards, and management to prioritize governance reforms that promote expertise, independence, and diversity within audit committees. By doing so, firms can better align their oversight functions with their strategic goals of fostering innovation and sustaining long-term growth. Board of Directors and Company Regulators** should establish policies that ensure audit committees are composed primarily of independent members to strengthen oversight and promote innovation. Corporate Governance Bodies and Company Management** should appoint audit committee members with relevant industry experience and technical knowledge to better oversee and support innovative projects. Board Nomination Committees should consider expanding audit committees to include diverse skill sets and perspectives, fostering a governance environment conducive to innovation. Focus on Overall Committee Effectiveness: Senior Management and Board Chairs** should emphasize improving the functioning and composition of the audit committee rather than solely concentrating on leadership roles, ensuring that the committee effectively supports innovation initiatives.

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