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Corporate Board Attributes and Audit Quality of Listed Oil and Gas Companies in Nigeria: Moderating Effect of Audit Committee Independence

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Abstract

This study explored the moderating effect of audit committee independence on corporate board attributes and audit quality of listed oil and gas in Nigeria. Using secondary data obtained from the audited annual report and accounts of the listed oil and gas companies between the periods of (2011 -2023). The result from the analysis revealed that board size has a negative and significant relationship with audit quality, board independence and audit committee independence have a positive but insignificant impact on audit quality and board gender diversity has a positive and significant impact on audit quality. The study also revealed that audit committee independence has a moderating effect on the relationship between corporate board attributes and audit quality of listed oil and gas companies in Nigeria. The control variable of firm size exhibited a negative yet insignificant impact on audit quality. In contrast, firm age demonstrated a positive and significant influence on audit quality. Additionally, leverage and return on assets showed a positive but insignificant effect on audit quality. This research concludes that larger boards can impede audit quality due to their increased complexity and diminished oversight. Likewise, independent boards, characterized by a higher number of non-executive directors, bolster audit quality by providing impartial oversight. Female directors provide important insights, which enhance risk management and ethical considerations, subsequently improving audit quality. Lastly, incorporating non-executive directors into audit committees reduces conflicts of interest, ultimately contributing to improved audit quality.

Keywords: Board attributes, Audit Committee Independence, Financial Performance, Corporate Governance.
JEL Classification:

Contribution to/Originality Knowledge: This study contributes to the existing literature by introducing and empirically validating the moderating role of audit committee independence on the interplay between corporate board attributes and audit quality of listed oil and gas companies in Nigeria. This original contribution extends beyond direct cause and effect analyses.

1.0 Introduction

Following deficiencies in corporate governance, the significance of audit quality has become increasingly prominent as a pivotal element. Audit quality promotes transparency and accountability, empowering stakeholders to make informed investment decisions. It has become a central focus of the International Auditing and Assurance Standards Board, leading to the development of enhanced global standards. Recognizing its importance for the public interest, the board has mandated corporations to adopt audit quality measures (Adewinmisi *et al.*, 2022).

Consequently, the Nigeria corporate governance code (2018) seeks to restore public trust and confidence in the Nigerian economy, stimulating increased trade and investments. A key initiative is the introduction of a unified board structure, where Non-Executive Directors (NEDs) are tasked with providing impartial oversight and ensuring that management acts in the best interests of all stakeholders. The company's directors, acting as its representatives, have a legal obligation to prepare and present financial statements accurately reflecting the organization's financial performance, financial position, and cash flow during the reporting period. To enhance the reliability of these financial reports, they must undergo external scrutiny by independent and qualified accountants before being presented to users (Akingunola *et al.*, 2018).

Scholars generally agree that board characteristics such as independence and financial expertise matter for sound governance, yet direct evidence that they lift audit quality remains uneven. This uncertainty has shifted attention to the wider context in which firms operate. Across emerging markets, researchers find mixed results and are increasingly asking how local institutions and cultural attitudes tip the balance. Nigeria exemplifies the puzzle; studies there frequently report hazy correlations between board traits and the calibre of audits, hinting that real leverage may come from a different source. When the audit committee is genuinely independent, its oversight seems to amplify whatever strengths the board brings to the table. In the oil and gas sub sector, where stakeholder stakes are immense, that added layer of autonomy is thought to be vital for securing trustworthy financial statements.

Independence meaning a clear distance from management is a defining trait of any effective audit committee. When committee members do not share personal or financial ties with company leaders, their oversight tends to be firmer and more dispassionate. In that environment, outside directors can push back without fear of upsetting someone they know well. Various studies find that the very presence of non-affiliated executives on the panel discourages boards from drifting toward unethical choices (Sultana *et al.*, 2015; De Vlaminck & Sarens, 2015). Those same outsiders help tighten the chain of command between external auditors and in house management, a configuration that correlates with cleaner financial statements and fewer intentional misreports (Kallamu & Saat, 2015; Dinu & Nedelcu, 2015).

This research probes how the independence of an audit committee can temper the link between board characteristics and the calibre of accounting oversight in oil-and-gas firms quoted on the Nigerian bourse. The petroleum sector occupies an outsized role in Nigeria’s economic fabric, routinely supplying a hefty share of Gross Domestic Product. Investors willingness to commit capital hinges on the reliability of financial reports churned out by these listed players. Crude and its by-products also account for a lion's share of the nation’s foreign exchange inflows (Uzonwanne, 2015; Adams, 2016). Consequently, anything that shakes or bolsters the oil-and-gas trade ripples through federal budgets, policy directives, and the countries pulse on growth metrics (Anyaehie & Areji, 2015).

Independence among the members of an audit committee is frequently cited as one of the first-order determinants of how reliable an external audit turns out to be. When committee members do not hold overlapping financial or personal ties to upper management, they are better positioned to act as impartial overseers of the firm's financial plumbing. Studies show that exactly this kind of detachment can temper self-interested impulses and push directors toward cleaner books. A pair of collaborations De Vlaminck and Sarens (2015) as well as Sultana and others (2015) report that adding outsiders with no internal loyalty to the enterprise tends to shrink the gap between reported earnings and true economic performance. Other investigations, including work by Dinu and Nedelcu (2015) as well as Kallamu and Saat (2015), link that same configuration of external oversight to fewer material misstatements and sharper overall audit quality.

Audit quality metrics recently dipped below the tolerable line for many investors, a warning bell that echoed across boardrooms and pension-fund meeting tables. Frustration seeped into conversations because high-profile miscalculations kept surfacing. In Britain, the 2014 Tesco saga set a troubling tone when managers inflated earnings by sleight of hand bookkeeping and the share price evaporated almost overnight. Financial authorities opened files, ordered interviews, and the retailer eventually coughed up sizeable fines. Cross-Channel comparisons were hard to ignore. Germanys Wire card, once a darling in the payments space, claimed out of thin air that it held 1.9 billion euros in cash; once that cushion disappeared, insolvency and the CEOs arrest followed in the same grim week of June 2020.

Audit firms themselves did not escape the drip of embarrassment. Carillion, a British contractor that collapsed in early 2018, became the standard case of a company living on yesterday's profits that auditors still signed off as solid. The Financial Reporting Council later showed little mercy and in early 2023 slapped Klynveld Peat Marwick Goerdeler with the biggest fine in its ledger, a record 21 million pounds, citing textbook failure from the Carillion numbers. High profile accounting scandals continue to shake even the sturdiest economies, toppling well-known firms and pulling the audit giants into the glare (Saidu & Aifuwa 2020). Many observers had assumed that such dramas belonged to history books, yet the alarm keeps ringing. Nigeria serves as a striking case in point: the Cadbury Nigeria episode and the more recent troubles at General Electric stripped public confidence in local markets, and the public memory is short but vivid. Analysts almost unanimously blame those embarrassments on disregard for the Nigerian corporate governance code, a rulebook that remains unevenly enforced (Aifuwa & Embele 2019; Akhidime 2015).

The code insists that board members retain genuine independence from top management, not merely the appearance of it. When that safeguard erodes, directors may chase glitzy headline profits while the firms' legs remain unbraced. The guidelines also call for trustworthy internal controls, because half-hearted procedures invite mischief and careless number-making. Once the accounting gateposts give way, auditors, regulators, and shareholders scramble to put the puzzle back together. Unfortunately, by that point the reputational damage has usually travelled far faster than any repair effort.

Repeated deficiencies in audit quality have triggered episodes of financial malfeasance within Nigeria's oil and gas sector. Iliemena and Okoye (2019) note that when auditors overlook critical controls, fraudulent transactions can slip through the cracks and leave investors in the dark. Weak oversight not only permits these irregularities; it also discourages fresh capital, as

Anyadiegwu and colleagues (2017) point out. Unsurprisingly, regulators soon take notice, raising the legal stakes for both the firms involved and the audit partners who sign the reports, a point emphasized by Adelopo *et al.* (2019).

Reputation, already fragile in big oil, suffers collateral damage when yearly statements come under a cloud of doubt. Stakeholders, lenders, and the general public are quick to read questions about the numbers as questions about character, as Adeyemi (2016) observed. In addition to public perception, risk management itself falters; inadequate procedures leave assessors blind to emerging threats, violating compliance benchmarks, Alabede (2018) warns.

This study therefore sets out to investigate a specific moderating force: the independence of the audit committee. Can an autonomous committee steer board members toward higher reporting standards, even when corporate governance practices are otherwise lax in Nigeria's listed oil and gas firms? The following sections offer a literature review that contextualizes the study, a methodology that describes the research design and data collection, and a results and discussion segment that analyses the findings in relation to the original questions. The document closes with a brief set of conclusions and recommendations for future inquiry.

2.0 Literature Review

Corporate board attributes encompass the measurable characteristics of a firm's board of directors, the panel ultimately entrusted with the enterprise's overall stewardship. Numerous empirical inquiries have traced both corporate triumphs and unexpected failures back to the interplay of managerial choices and the broader governance routine (Ajayi, 2017). In this study three discrete dimensions board size, director independence, and gender inclusiveness are use as lenses through which to gauge oversight effectiveness. The board itself remains the apex deliberative forum within any publicly traded concern, tethered, in theory at least, to the contrasting demands of shareholders, employees, creditors, and the wider community. Information, flowing both ways across that table, serves as the stock-in-trade for balanced decision making.

Auditors, hired by client organizations, carve out their own brand of quality in the financial statement review process, phenomenon scholars routinely define as audit quality (Khudhair *et al.,* 2019). Routine tests, confirmatory inquiries, and surprise spot-checks translate professional standards from pamphlet to pavement. Control checklists that firm practitioners apply strive to level the playing field, so every engagement mirrors the rigor of the last (Arens *et al.,* 2016). Standards do not stop at an opening handshake; general ethical norms, fieldwork protocols, and the structuring of final reports form the tripartite spine of consistent output. Meeting that triplet is less a goal than a baseline. Anything short of compliance diminishes credibility and, by extension, market confidence.

Independence in an audit committee centres on the complete severing of personal, professional, or economic ties that might cloud its members' judgment. The committee was originally devised to level the information and expense imbalance that pits shareholders the principals against managers the agents. In practice it sits close to the pinnacle of a firm's hierarchy, issuing its reports straight to the Board of Directors (Zalata *et al.*, 2017). Many observers now regard that very independence as the Board's sharpest instrument for lifting the overall standard of external audit work (Liu *et al.*, 2016).

Tiwari and Maji (2025) explored how various dimensions of corporate governance shape the quality of external audits within Indias growing market. Their analysis drew on a random sample of one hundred non-financial companies listed on the Bombay Stock Exchange, covering the years from 2017 to 2021. To sift through the panel dataset, the authors applied both logistic regression and standard panel-data techniques. Rigorous tests suggested that greater board independence, a higher ratio of women to men among directors, the presence of multiple chairs, and a strong audit committee each pushed audit quality upward. In contrast, larger boards, a single individual holding both the chief executive and chair titles, and heavy promoter ownership appeared to drag the level of assurance downward.

Yunana (2024) recently investigated how various dimensions of corporate governance influence the quality of audits performed on Nigeria s listed insurance firms between 2018 and 2022. The researcher collected quantitative records from all twenty-two companies traded on the Nigerian Exchange Group (NGX) and then applied multiple regression techniques to detect meaningful patterns. The analysis indicated that neither the sheer size of the board nor the presence of financially trained directors offered a statistically reliable link to superior audit work. By contrast, boards made up of a larger share of independent members and those that included women in noticeable numbers were both associated with higher-quality auditing outcomes.

Alkhazalih *et al.* (2023) pursued a somewhat parallel question by studying Jordan's publicly traded enterprises. Their dataset comprised 624 unique firm-years drawn from seventy-eight companies listed on the Amman Stock Exchange between 2012 and 2019. To handle serial correlation and uneven error spreads, the authors relied on panel-corrected standard errors in their regressions. Results showed that boards marked by independence and firms controlled by founding families tended to yield poorer audits, whereas larger boards and concentrated ownership structures coincided with better audit performance. In contrast, the extent of managers equity stake and the proportion of female directors appeared statistically insignificant in shaping audit quality.

Kabwe (2023) investigated how various corporate governance features affect the quality of financial reporting among listed firms in Zambia. The researcher performed a quantitative content analysis on annual reports and audited accounts from 2012 to 2018, effectively creating a longitudinal panel dataset. Panel regression served as the primary analytical tool. Findings indicated that larger boards are statistically linked to improved reporting quality. Governance traits such as accounting expertise, gender diversity on the board, and audit-committee independence showed positive but statistically weak connections with the same outcome. In contrast, board independence appeared negatively correlated with reporting quality, though that relationship too lacked statistical strength.

Bala and colleagues (2023) focused on Nigerian oil-and-gas companies, asking whether board characteristics shape the extent of their environmental accounting disclosures. The sample comprised 13 firms over the period from 2014 to 2020, and pooled regression techniques were applied. Results suggested that disclosures about environmental impact are meaningfully driven by the financial know-how of board members, the independence of audit committees, and the financial proficiency of those committees.

The stakeholder model maintains that a boards environmental stewardship, in its role as guardian of shareholder interest, invariably boosts reputation and attracts both investors and customers. A surprising corollary, however, is that the degree of independence among board members appears to make little difference to the volume of environmental disclosures. This gap in accountability has led scholars to urge regulators in Nigeria's oil and gas sector to enact stronger mandates; legislation of that sort would compel firms-large or small, profitable or not-to publish the environmental data society increasingly demands. For measuring the integrity of those reports, researchers point to the Global Environmental Disclosure Index (GEI) as the fairest yardstick currently available in Nigeria.

An (2023) studied Korean firms to determine whether the characteristics of an audit committee translate into higher audit quality, drawing on panel data from 2008 to 2018. The committee's activity level, financial expertise, general independence, and the presence of a female member served as proxies for its quality; auditors size and the reliability of accruals acted as gauges of broader audit performance. Findings suggest that active, knowledgeable committees do enhance quality while strict independence does not seem to matter, although the addition of a female director produces a moderate uptick.

Azizkhani *et al.* (2023) turned their attention to Australian firms and zeroed in on the person sitting at the head of the audit committee. They gathered data from company records, proxies, and even annual reports filed by subsidiaries to build a hand-coded dataset often described as stubbornly local.

The findings offer a portrait of the chair that is almost counter-intuitive. A holder with lengthy boardroom tenure and multiple audit committee seats is more inclined to recommend a Big 4 or industry-specialist firm, sign off on heftier invoices, and leave the books thinner in discretionary accruals.

Chairs who parade a string of business degrees follow a similar script, steering the firm to a Big 4 auditor, pushing audit fees upward, and trimming the leeway managers enjoy with accruals. Conversely, executives already treading the halls of corporate management appear to shun the Big 4, letting discretionary accruals swell in the process. Titles matter but so does the lived experience of steering several committees at once; that dual-weighted profile seems to pull the auditor decision in a distinct, costlier, yet cleaner direction.

Ahmad *et al*. (2023) set out to determine whether the strength of an audit committee alters the connection between the quality of the audit and the level of earnings manipulation that actually occurs on the ground. They proxy audit quality by four distinct proxies: independence, fee, tenure, and size; earnings management is captured through real activities adjustments; and committee strength is summarized in a single governance score. The researchers gathered a decade-long panel of data from 113 non-financial firms, ultimately trimming the sample to 76 companies that fit the specifications of their primary model. Multiple-linear regression served as the analytical workhorse, yielding the headline finding that a stronger audit committee significantly dims the room for auditors and managers to game the reported numbers together. A second set of estimates shows that independence boosts earnings management in a statistically weak yet positive way, size and fee both raise it in a strong and reliable manner, and longer tenure pushes it downward with significance. In short, while scale and price of the audit reinforce earnings smoothing, the committees watchful eye flips the entire equation.

Khuong *et al.* (2022) investigated how corporate governance influences audit quality in the context of publicly listed companies in Vietnam, while also considering whether varying degrees of ownership concentration alter that link. The researchers operationalized governance by counting board seats, noting whether the CEO also chaired the board, and gauging directors' independence; they regarded audit quality essentially as a Big Four or not decision. For analysis they employed a logistic regression framework, drawing on 3110 unique firm-year records from 622 companies over the 2014-2018 window. Oddly, the odds ratios pointed to a negative relationship-between stronger in-house control mechanisms and the appearance of high-grade auditing. That finding hints that, ironically, tighter internal monitoring may coincide with a less-definitive external audit stamp of approval. Readers should note the study leans heavily on a handful of governance and quality markers, leaving plenty of room for richer, multi-faceted metrics in future work.

Pious *et al.* (2022) drilled down into the inner workings of Ghana's listed firms by looking at how board make-up colours the crispness of financial audits. The researchers, working with data from 2012 to 2019, slotted twenty-five companies into a panel regression that teased apart board size, independence, gender mix, and the oft-debated CEO duality. The numbers spoke clearly: heftier boards, more independent directors, and a stronger female presence each chipped away at the cushion of discretionary accruals, sharpening overall audit quality. A different strain of evidence arrived with CEO duality, which, rather predictably, bloated those same accruals and dimmed the audits glare. The study controversially employs chief-executive-officer duality as its primary board-proxy variable. In unvarnished terms, CEO duality means the same person wears both the managerial and chairperson hats, a setup many scholars consider untenable. Because one individual control both strategy and oversight, the board can easily drift from acting in the broader shareholder interest. Such concentration of power often blunts the very governance levers designed to enforce accountability. Notably, most national governance codes-especially those drafted after the Sarbanes-Oxley era openly discourage this dual structure.

Across several recent enquiries Tiwari and Maji (2025), Pious *et al.* (2022), and others the relationship linking conventional board variables such as size, independence, meeting frequency, and gender mix to audit quality has proven decidedly mixed. The scattershot results imply that some hidden moderator might be shifting the outcomes, a suspicion already voiced in sector-specific debates about oil and gas firms. To test that hypothesis, the present study zeroes in on the unique role of audit committee independence, asking whether that attribute smooths out or magnifies the links between board features and the calibre of external audits for listed oil and gas enterprises in Nigeria.

2.1 Theoretical Review

2.1.1 Signaling Theory

In 1973 Michael Spence first sketched the outline of what would later be called signalling theory. Put simply, the notion holds that firms broadcast selective bits of information in order to sway outside investors. Such disclosures let those investors parse the overall health and steadiness of the business in question (Brigham & Houston 2011). The same logic extends to the quality of the audit because a top-tier service sends its own message to the marketplace about the reliability of the numbers. Fees paid to the auditing firm often serve as a rough proxy for that quality. When the public sees that a company has engaged a well-respected practice at a premium rate, the assumption is that the resulting report is worth trusting. Thus, a solid audit does more than check boxes: it underpins user confidence in the financial statements.

Signalling theory attempts to explain why a firm might spend, or even stretch its budget, on visible markers of quality. The underlying intuition is straightforward: deliberate choices form a message that lingers long after the transaction is complete. Viewed through this lens, a corporate board that hires one of the Big Four audit outfits Price Waterhouse Coopers, Deloitte, Ernst & Young, or Klynveld Peat Marwick Goerdeler is making a statement rather than merely ticking a compliance box. Investors see that nameplate and assume the numbers have been scrutinized by lawyers, forensic specialists, and a small army of junior auditors. The instant credibility boost can affect the bottom line. Lenders, comforted by the brand cachet, often offer lower rates because they estimate the odds of creative accounting have shrunk. Over time and with any luck during the next bond issue-those savings can add up to real money.

3.0 Methodology

This study adopted the correlational research design to examine the effect of corporate board attributes, audit committee independence on audit quality of listed oil and gas companies in Nigeria. Panel data was used in conducting a multiple regression analysis, given the nature of the model variables. This approach allows the examination of both time and cross-sectional effects in the data for this study. The study covered the periods of (2011-2023) and was limited to listed oil and gas companies for the periods under review.

3.1 Variable Definitions and their Measurements

The independent variables of this study are the board size, board independence, board gender diversity, the moderating variable is audit committee independence while the dependent variable is audit quality. The control variables are firm size, firm age, leverage and return on assets. Table 1 show the measurement of the variables.

Table 1: Measurement of variables

Variable	Indicator	Measurement	Source
Audit Quality (Dependent variable)	Big 4	Dummy variable using the value 0 for company not audited by Big 4, and 1 otherwise	Khudhair *et al*., (2019); Ilaboya & Ohiokha (2014)
Board Size (Independent variable)	BS	The total number of directors serving on the board of directors	Mustafa et al., (2018); Margined & Azhaar (2013)
Board Independence (Independent variable)	BI	Percentage of independent and non-executive directors divided by the actual executives on the board yearly	Al-Najjar (2018); Sakka & Jarboui (2014); Aifuwa & Embele (2019)
Board Gender Diversity (Independent variable)	BGND	The proportion of number of women board members to the total number of board members	(Agyei-Mensah, 2019)
Audit Committee Independence (Moderating variable)	ACI	Proportion of non-executive directors to audit committee size	Rahman, *et al.*, (2014); Gabriela (2016)
Firm Size (Control variable)	FSZ	The natural logarithm of the total assets of the selected companies	Aifuwa & Embele (2019); Ilaboya & Lodikero (2017)
Firm Age (Control variable)	FA	Year of listing – Year of observation	Pranesh & Chinmoy (2017); Salah & Elewa (2018); Kajola *et al.*, (2019)
Leverage (Control variable)	LEV	Ratio of total debts to total assets	Kajola et al., (2015); Samad (2015); Hajawiyah *et al.*, (2020)
Return on Asset (Control variable)	ROA	Profit before interest and tax/Total assets	Mohammed, (2015); Mainoma & Nasir, (2023)

Source: Researchers' Compilation, 2025

3.2 Model Specification

This study adapts the models outlined below with changes that align with previous research to test the effect of corporate board attributes and audit committee independence on audit quality of listed oil and gas companies in Nigeria (Khudhair *et al.* (2019). Regression analysis is a statistical technique used to estimate the relationships between a dependent variable (audit quality) and one or more independent variables (corporate board attributes). It also allows for the inclusion of control variables that might also influence audit quality (such as firm size, firm age, leverage and return on asset).

3.3 Direct Relationship

$$AUDQ_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BGND_{it} + \beta_4 FSZ_{it} + \beta_5 FA_{it} + \beta_6 LEV_{it} + \beta_7 ROA_{it} + \varepsilon_{it} \quad (1)$$

Variable Inclusion (Moderating variable, audit committee independence)

$$\begin{aligned} AUDQ_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BGND_{it} + \\ \beta_4 ACI_{it} + \beta_5 FSZ_{it} + \beta_6 FA_{it} + \beta_7 LEV_{it} + \beta_8 ROA_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

(Interaction of the independent variables with the moderating variable)

$$\begin{aligned} AUDQ_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BGND_{it} + \beta_4 ACI_{it} + \beta_5 BS_{it}^{*} ACI_{it} + \beta_6 BI_{it}^{*} ACI_{it} \\ + \beta_7 BGNDi_{it}^{*} ACI_{it} + \beta_8 FSZ_{it} + \beta_9 FA_{it} + \beta_{10} LEV_{it} + \beta_{11} ROA_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

Where:
AUDQ: Audit Quality
BS: Board Size
BI: Board Independence
BGND: Board Gender Diversity
ACI: Audit Committee Independence
FSZ: Firm Size
FA: Firm Age
LEV: Leverage
ROA: Return on Asset
β0 = regression intercept which is constant
β1, β2, β3, β4, β5, β6, β7, β8, β9, β10 β11= the coefficient of the explanatory variables
ε is the error term of the model
i = cross-sectional variable
t = time series variable

4.0 Results and Discussion

Table 2: Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
AQ	104	0.5865	0.4948	0.0000	1.0000
BS	104	7.6827	1.7138	4.0000	13.000
BI	104	0.6192	0.1424	0.2857	0.8889
BGND	104	0.1984	0.1002	0.0000	0.5000
ACI	104	0.4495	0.0643	0.2500	0.6000
FSZ	104	17.722	1.9644	13.228	21.344
FA	104	38.500	16.038	5.0000	68.000
LEV	104	0.1009	0.0897	0.0000	0.2981
ROA	104	0.0159	0.1093	-0.3627	0.3990

Source: Author’s Computation, (2025)

Table 2 shows that audit quality (AQ) has a mean of 0.5865, standard deviation of 0.4948, minimum of 0.0000 and the maximum of 1.0000. The mean value of 0.5865 suggests that on average, the audit processes or outcomes meet about 59% approximately of the expected quality standards for the periods under review. The standard deviation implies that there is no dispersion of data from the mean because the standard deviation is less than the mean value. The minimum value of 0.0000 connotes that some listed oil and gas companies were not audited by the Big 4 while, the maximum value of 1.0000 represents some listed oil and gas companies audited by the Big 4.

The Table also revealed that the mean value of board size (BS) is 7.6827, standard deviation of 1.7138, the minimum and maximum values 4.0000 and 13.000 respectively. The mean value of 7.6827 indicates that on the average, board size for the listed oil and gas companies are 8 board members approximately. The standard deviation of 1.7138 signifies that there is a low variation of the data from the mean because the standard deviation is less than the mean value. The minimum and maximum values of 4.0000 and 13.000 for board size signify that the smallest board had 4 members, while the largest board had 13 members serving on the board of directors.

The mean value of board independence (BI) is 0.6192, the standard deviation is 0.1424, while the minimum and maximum values are 0.2857 and 0.8889 respectively. The mean value of 0.6192 depicts that the board independence of the companies is 62% approximately which implies that on the average, the listed oil and gas companies' board independence level is at 62% which is reasonably okay. The standard deviation of 0.1424 signifies that there is low dispersion of the data from their mean because the standard deviation value is lower than the mean value. The minimum value of 0.2857 suggest that there is a company(companies) where only 29% of the board members are considered independent as this is a relatively low level of independence. Conversely, the maximum value of 89% represents a company (or companies) with a very high level of board independence as majority of board members have no significant ties to the company, which is generally considered as a positive indicator of good corporate governance.

Table 4.1 also shows that the board gender diversity (BGND) has a mean value of 0.1984, standard deviation of 0.1002 with 0.0000 and 0.5000 as the minimum and maximum values respectively. The mean figure depicts that on the average, 20% of the board members are women. The figure for standard deviation of 0.1002 signifies low dispersion of data from their mean because the standard deviation is less than the mean value. Furthermore, the minimum value of 0.0000 (0%) indicates that there are companies that do not have female representation on their boards during the period of this study and the maximum value of 0.5000 indicates that there are companies that have at most 50% female representation on their boards during the period of this study which signifies that no company in the study achieved above equal representation of men and women during the study periods. This suggests that while some progress may have been made towards gender diversity, women remain underrepresented in board roles, with even the highest on the basis of equality.

However, audit committee independence (ACI) which is the moderating variable of this study has a mean and standard deviation values of 0.4495 and 0.0643 respectively. Also, with a minimum and maximum values of 0.2500 and 0.6000 respectively. The mean value of 0.4495 indicates that averagely the proportion of non executive directors to the audit committee size is 45% approximately. The standard deviation of 0.0643 is less than the mean value suggesting lower dispersion of the data from the mean value. The minimum value of 25% signifies that the least company have an audit committee size with only 25% of it's members being non executive directors while the maximum of 60% implies that some companies have an audit committee with only 60% of it's members being non executive directors which is reasonably okay.

Firm size (FSZ) has a mean and standard deviation values of 17.722 and 1.9644 respectively with 13.228 and 21.344 as the minimum and maximum respectively. Additionally, Table 4.1 reveals that firm age (FA) has mean and standard deviation of 38.500 and 16.038 respectively, while having a minimum and maximum values of 5.0000 and 68.000 respectively. Also, the mean and standard deviation of leverage are 0.1009 and 0.0897 respectively with a minimum and maximum values of 0.0000 and 0.2981 respectively. Conclusively, return on asset (ROA) has a mean and standard deviation of 0.0159 and 0.1093 respectively with a minimum and maximum values of -0.3627 and 0.3990 respectively.

Table 3: Pairwise Correlation Matrix

VAR	AQ	BS	BI	BGND	ACI	FSZ	FA	LEV	ROA
AQ	1.0000								
BS	0.0613	1.0000							
	0.5364								
BI	0.4089*	0.1700	1.0000						
	0.0000	0.0845							
BGND	0.3855*	-0.310*	0.1780	1.0000					
	0.0001	0.0013	0.0706						
ACI	0.1005	0.2982*	0.2167*	-0.233*	1.0000				
	0.3101	0.0021	0.0272	0.0175					
FSZ	-0.284*	0.1027	-0.472*	-0.338*	-0.212*	1.0000			
	0.0035	0.2997	0.0000	0.0005	0.0311				
FA	0.4961*	0.5999*	0.4065*	-0.012	0.1402	-0.054	1.0000		
	0.0000	0.0000	0.0000	0.9048	0.1557	0.5881			
LEV	-0.040	0.0302	-0.029	-0.158	0.0750	0.0445	-0.064	1.0000	
	0.6862	0.7608	0.7634	0.1099	0.4495	0.6536	0.5197		
ROA	0.1436	0.0975	0.0560	-0.055	0.0706	-0.090	0.1506	-0.277*	1.0000
	0.1460	0.3247	0.5725	0.5786	0.4762	0.3636	0.1269	0.0044	

Source: Author's Computation, (2025)

*=significant at 1% (0.01), **= significant at 5% (0.05), ***= significant at 10% (0.1)

Table 3 shows that board size (BS) has a positive but insignificant relationship with audit quality (AQ) to the tune of 6%. Also, the table revealed a positive and significant relationship between board independence (BI) and audit quality (AQ) which is at 1% level of significance to the tune of 41% approximately. Similarly, board gender diversity (BGND) has a positive and significant relationship with audit quality to the tune of 39% approximately. Furthermore, the association between audit committee independence (ACI) and audit quality (AQ) is positive but insignificant. From the table 4.2, firm size (FSZ) and firm age (FA) revealed positive significant relationship with audit quality at 1% significance level, while leverage had a negative and insignificant relationship with audit quality. Return on assets (ROA) revealed a positive but insignificant relationship with audit quality (AQ).

On the other hand, board independence is found to be positive and insignificantly associated to board gender diversity and return on assets only, it is negative and significantly related to firm size. Conversely, it is positive and significantly related to firm age. For the association between board size and other independent variables. Board size is positively related to board independence, audit committee independence, firm size, firm age, leverage and return on assets but the variable is found to be inversely associated with board gender diversity.

Additionally, with regards to the relationship between board gender diversity and other variables board gender diversity had a negative but significant relationship with audit committee independence and firm size. Also, board gender diversity had a negative and insignificant relationship with firm age, leverage and return on asset of listed oil and gas companies in Nigeria.

Table 4.1: Regression Results for Model 1

Variables	Coefficients	T	p>|t|	VIF/Tolerance
Constant	0.0437	0.08	0.938	
BS	-0.060	-2.1	0.042	1.83/0.5464
BI	0.4545	1.39	0.169	1.59/0.6284
BGND	1.4948	3.51	0.001	1.33/0.7509
FSZ	-0.016	-0.7	0.490	1.47/0.6823
FA	0.0172	5.36	0.000	1.93/0.5176
LEV	0.1575	1.08	0.281	1.12/0.8898
ROA	0.2579	1.35	0.180	1.13/0.8819
R^2		0.4635		
F-Stat.		11.85		
Prob>F		0.0000		

Source: Author's Computation, (2025)

The multiple coefficients of determination-cumulative R^2now stands at 0.4635, meaning that close to 46% of the fluctuations in audit quality among Nigeria's listed oil and gas firms can be traced back to board size, independence, gender mix, company age, leverage, and the standard balance sheet measure of return on assets. A share this large suggests the selected predictors are working together in a meaningful way. F-statistics roughly echo that conclusion; when the test is standardized, its limiting behaviour lines up with a chi-squared distribution as denominator degrees of freedom stretch toward the infinite horizon. The observed F-value of 11.85, comfortably crossing the 1 percent significance barrier, confirms the overall regression model is a sound fit.

Board size (BS) emerges with a regression coefficient of -0.060, a T-statistic of -2.1, and a P-value of 0.042; all values steer the interpretation toward significance at the 10% threshold. The negative coefficient signals that each additional director appears to pull audit quality downward by roughly 6% among Nigerias listed oil and gas firms. Such a shift is considerable and becomes the cornerstone for dismissing the null hypothesis, which had asserted that board size leaves audit quality unchanged. The outcome aligns neatly with Khuong *et al.* (2022), who report similar inversions, yet it runs counter to Alkhazalih *et al.* (2023) and Pious *et al.* (2022), both of whom chart a different course. Agency theory provides a ready framework here, suggesting that oversized boards corrode vigilance because of coordination headaches, free riding tendencies, and sluggish decision cycles, all of which invite weaker scrutiny of the auditing chain.

Similarly, the data echoed core assertions of resource dependence theory: an expanded boardroom can unlock a broader array of external ties and competencies, yet the sheer size may blunt the council's overall decisiveness. The implication is hardly trivial; the prospective advantage in resource procurement and control may easily be eclipsed by the managerial drag of constant negotiation and information sharing.

In the present analysis, board independence (BI) exhibits a coefficient of 0.4545, paired with a t-statistic of 1.39 and a p-value of 0.169. this is within the conventional thresholds for significance; thus, the result fails to reach any standard alpha level. The recorded positive coefficient implies that a 1% rise in BI is associated with nearly a 45% increase in the assessed audit quality of Nigerias listed oil firms; yet, that relationship remains statistically hollow. In practical terms, the null hypothesis suggesting that BI exerts no meaningful influence on audit quality is not rejected. Pious *et al.* (2022) and Khudhair et al. (2019) reported similar patterns- a positive link that nevertheless did not attain statistical import. In contrast, Khuong *et al.* (2022) and Mustapha *et al.* (2019) documented a significant negative correlation, highlighting an ongoing debate about how director independence actually interacts with the probity of financial audits in the sector.

Recent research echoes the central intuition of agency theory, which portrays an independent board as a conduit between shareholders and auditors. Greater board autonomy is presumed to sharpen oversight and, by extension, lift audit quality. Yet the observed relationship remains statistically insignificant, hinting that board distance from management does not translate into firmer scrutiny in Nigerias listed oil and gas sector.

The statistical output places board gender diversity (BGND) at a striking 1.4948, accompanied by a t-statistic of 3.51 and a p-value that drops to 0.001. Those numbers sit comfortably within the 1% significance threshold most researchers find compelling. The coefficient translates roughly into a 150% change in audit quality for every 1% change in BGND among Nigeria's listed oil and gas firms. Put another way, the boardroom gender mix not only matters; it matters a great deal. Such robust evidence neatly overturns the null hypothesis the project began with, a proposition that insisted BGND exerted no meaningful influence on audit outcomes. The result lines up nicely with Pious *et al.* (2022), who also reported a beneficial link between female representation at the board level and the soundness of audit work. Yet concordance with one study inevitably invites discord with others. Alkhazalih *et al.* (2023), Jacob (2022), and Mustapha *et al.* (2019), for example, each documented a contrary, negative connection, suggesting the issue is far from settled.

The finding does, however, echo resource dependence theory, which argues that women directors carry unique social and informational assets to the table. That variety of resources appears to bolster the boards capacity to supervise auditors and vet financial reports, thereby lifting overall audit quality. Whether the same dynamic holds across different industries or jurisdictions remains an open question, but the Nigeria's oil and gas sector has now added its voice to the debate. In line with long-standing arguments rooted in stakeholder theory, the dataset indicates that a board composed of individuals with varied gender backgrounds tends to register heightened sensitivity to the concerns of shareholders, employees, and the surrounding community alike. That heightened attentiveness often coincides with an increased dedication to transparency and accountability, a shift that regulators and analysts usually associate with observable improvements in audit quality.

The first control variable examined is firm size (FSZ). The table reports a coefficient of -0.016, a T-statistic of -0.7, and a P-value of 0.490, indicating that the statistic remains well above conventional significance thresholds. Such a negative coefficient suggests that a 1% increase in the size of a listed oil or gas company is aligned with roughly a 2% decline in audit quality.

Firm age (FA) displays a contrasting pattern. Its coefficient of 0.0172 is matched with a T-statistic of 5.36 and a P-value of 0.000, making the finding significant at the 1% level. Taken at face value, the estimate indicates that a 1% increase in the age of the firm is likely to lift audit quality by something close to 2%.

Lastly, leverage (LEV) presents a coefficient of 0.1575 and carries a T-statistic of 1.08; the associated P-value of 0.281 reaffirms that this relationship falls short of significance regardless of the cutoff employed. A coefficient of 0.1575 attaches a meaningful and statistically positive link between leverage (LEV) and the quality of the audit. In practical terms, the figure suggests that a single-point rise in LEV, measured as a percentage, nudges audit quality upward by roughly 16 percentage points.

As revealed by the table-shows return on assets (ROA) carrying a coefficient of 0.2579. The companion t-statistic sits at 1.35, and the p-value at 0.180, which keeps the result below conventional thresholds of significance. Even so, the 0.2579 coefficient quietly implies that a 1% gain in ROA is linked to an almost 26% change in audit quality among the listed oil-and-gas firms.

Table 4.2 Regression Results for Model 2

Variables	**Coefficients**	**T**	**p>|t|**
Constant	-0.479	-0.7	0.468
BS	-0.070	-2.4	0.020
BI	0.3993	1.22	0.226
BGND	1.6528	3.79	0.000
ACI	0.9757	1.51	0.135
FSZ	-0.007	-0.3	0.761
FA	0.0176	5.50	0.000
LEV	0.1475	1.02	0.310
ROA	0.2505	1.32	0.190

R^2	0.4761
F-Stat.	10.79
Prob>F	0.0000

Source: Author's Computation, (2025)

From the regression result of model 4.2 of this study, it can be seen that moderating variable (audit committee independence) is positively but insignificantly related to the audit quality of from the coefficient and p-values of 0.9757 and 0.135 respectively. The positive coefficient value of 0.9757 signifies that audit committee independence (ACI) and audit quality of listed oil and gas companies are directly related which implies that for every 1% increase in ACI, audit quality of listed oil and gas companies will increase to the tune of 96% approximately. This provides evidence of failing to reject null hypothesis of the study which states that ACI has no significant impact on the audit quality of listed oil and gas companies in Nigeria.

Table 4.3 Regression Results for Model 3

Variables	**Coefficients**	**T**	**p>|t|**
Constant	-0.167	-0.1	0.921
BS	-0.366	-2.2	0.033
BI	3.7828	1.62	0.109
BGND	0.0717	0.02	0.982
ACI	-0.453	-0.1	0.893
BS_ACI	0.6694	1.77	0.079
BI_ACI	7.4492	-1.5	0.146
BGND_ACI	4.0140	0.56	0.575
FSZ	0.0042	0.17	0.867
FA	0.0180	5.45	0.000
LEV	0.1753	1.20	0.233
ROA	0.2528	1.33	0.186
R^2		0.4966	
F-Stat.		8.25	
Prob>F		0.0000	

Source: Author's Computation, (2025)

An analysis of un-moderated data reveals a statistically significant negative correlation between board size and audit quality within Nigerias listed oil-and-gas sector. Once that same relationship is subjected to moderation by audit-committee independence, the sign flips to positive but loses its statistical heft, becoming insignificant. Fairchild and MacKinnon (2009) emphasize that moderating variables can fortify, dilute, or even invert an existing link. The current evidence thus supports their claim, illustrating that audit-committee independence does, in fact, shift the character of the board-size-quality nexus, even if the eventual impact remains statistically flat.

Board independence, on the other hand, presents a different story. Its raw association with audit quality is slightly positive but statistically trivial, and the same pattern endures after introducing moderation. These results imply that board independence neither strengthens nor weakens the connection between overall board attributes and audit quality, a finding consistent with Fairchild and MacKonnons understanding of moderation. The absence of any directional shift reinforces the notion that not every corporate governance variable plays an active moderating role.

Gender composition atop the board was linked to heightened audit quality among the quoted oil and gas firms. That link, however, dulled into insignificance once a moderating influence was applied. Put differently, board diversity shifts the original slope of the independent-audit-quality connection and does so in a way that, while still positive, lacks conventional statistical strength. Fairchild and MacKinnon (2009) remind us that a moderator can blunt, amplify, or simply flip the sign of a relationship, and this case seems to exemplify that principle.

Metrics shown in Table 4.3 reveal that audit-committee independence, when treated as a moderator, nudges the squared correlation from 0.4635 to 0.4966. The gain in R2 argues that an autonomous committee amplifies the linkage between other board features and the quality of audits performed. On the basis of that evidence, the null hypothesis which asserts no meaningful moderating role for committee independence is rejected without hesitation.

Table 4.4: Multicollinearity Test

Variable	**VIF**	**1/VIF**
BS	1.83	0.5464
BI	1.59	0.6284
BGND	1.33	0.7509
FSZ	1.47	0.6823
FA	1.93	0.5716
LEV	1.12	0.8898
ROA	1.13	0.8819
Mean VIF		

Source: Author's Computation, (2025)

Assumed multicollinearity led the present check to examine the variance inflation factor. A maximum VIF of 1.93 and a minimum of 1.12 fell well short of the conventional threshold of 10 and therefore indicated no serious overlap among the predictors. Possible heteroscedasticity was subsequently tested with the Breusch-Cook-Weisberg procedure. This is because the associated p-value of 0.0624 exceeded the 0.05 significance cutoff, the residuals appeared homoscedastic.

5.0 Conclusion and Recommendation

The empirical literature frequently associates oversized boards with diminished audit quality, a pattern that scholars attribute to heightened complexity and coordination hurdles. When too many voices fill the room, essential decisions can stagnate, allowing disagreements to smother momentum. Auditors, in turn, confront a governance structure that is unwieldy and fragmented. This persistent discomfort fuels the ongoing debate about an optimal board size for Nigeria's listed oil and gas firms one balance sheet at a time, practitioners and researchers alike prune their recommendations.

Board independence poses a different but equally vital line of defense. A higher proportion of non-executive directors typically fortifies the panels objectivity and alters the power calculus in the boardroom. Adding just one extra NED, though a modest-seeming move, can tip that calculus enough to bolster the auditor's sense that managerial claims merit close scrutiny. In the specific context of Nigerian oil and gas companies, that boost in independence is often cited as a swift lever for improving audit outcomes and restoring investor confidence.

Bringing a female director into the boardroom often means encountering fresh viewpoints and sets of skills that can shake up the usual line of questioning directed at executives. Those differing life experiences sometimes translate into sharper attention to risk and a renewed emphasis on ethics, both of which tend to shore up board oversight. High-quality audit work typically follows when directors press management a little harder. An independent audit committee serves as a crucial firewall between the corporate board and the outside audit firm, helping to keep each audit report honest and unvarnished. Because truly independent members have neither budgetary strings nor personal loyalties tying them to company leadership, they can speak and vote without fear of blowback.

Studies indicate that placing one or two outsiders at the table can blunt the impulse for unethical shortcuts at the executive level. Their mere presence raises the cost of misconduct and, in turn, boosts both the reliability of financial data and the quality of the audit itself. The effect is somewhat cumulative; every extra non-executive seat chips away at potential conflicts of interest. When that balance tilts toward independence, the odds of material misstatements decline noticeably.

In light of the findings and conclusions above, the study offers the following recommendations:

i. Instead of increasing board size of listed oil and gas companies, the board of directors should focus on improving communication and coordination among board members through clearly defined roles and responsibilities for each board member, particularly concerning audit oversight. This will ultimately enhance the audit quality of listed oil and gas companies in Nigeria.
ii. The board of directors of the company should also ensure the inclusion of more non-executive directors (NEDs) that will constitute the board members who can exercise sound judgment and challenge management decision where necessary. Non-executive directors introduce independent perspective, enhanced oversight, improved decision making and enhanced reputation to the board making it more robust as they have no significant financial or personal ties with the company, hence, promoting a culture of independence within the board room.
iii. For the board gender diversity, the board of directors should increase the number of female directors on their boards because female directors bring different perspectives and experiences to the boardroom, leading to more robust discussions and better oversight. They tend to ask more challenging questions, leading to more thorough risk assessment and more effective monitoring of management. This can be achieved through targeted recruitment efforts, mentorship programmes, and initiatives to promote leadership roles.

iv. The management should ensure the strengthening of audit committee independence through the inclusion of more non executive directors in the audit committee as this will guarantee a truly independent committee, free from undue influence from the management of the company. Consequently, the board of directors should include audit committee independence as moderator on the relationship corporate board attributes and audit quality because it has a moderating capacity.

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