Board Structure Mechanisms and Audit Quality of Publicly Quoted Oil and Gas Firms: Evidence from Nigeria

[1]Otemu Eseoghene, PhD and [2]Otemu Oghenevwogaga

[1]Department of Accountancy, Delta State Polytechnic Otefe Oghara, Delta State, Nigeria
[2]Department of Banking & Finance, Delta State Polytechnic Otefe Oghara, Delta State, Nigeria
Email: otemuese@gmail.com & *otemuogaga@fmail.com*

Abstract

This study was carried out with a view to evaluating the effect of board structure mechanisms on audit quality, with moderating role of firm size of quoted oil and gas firms in Nigeria from 2000-2019. The independent variables are board size and independence, while firm size is the moderating variable. Audit fee was taken as the dependent variable. The choice of audit fee as proxy for audit quality is anchored on audit firms being classified as Big-4 and non-Big 4 and dictates the expertise of audit firm in ensuring quality audit. Secondary data obtained from the audited annual reports and accounts of the studied firms were analysed using descriptive and inferential statistics. The study employed feasible generalized least square (FGLS) regression estimation technique to correct for the presence of group-wise heteroscedasticity and first order auto serial correlation while non-normality of residual was taken care-off by carefully interpreting the p-values instead of t-values of the coefficients. The results revealed the heterogeneous effects of corporate governance mechanisms on audit quality as moderated by firm size. Specifically, board size (coefficient = -0.017 b*0y 8, z_statistics = -3.42) significantly and negatively affected audit quality, while board independence (coefficient = -0.056, z_statistics = -0.77) had no significant effect on audit quality of quoted oil and gas companies in Nigeria. The study recommended among others the need to accomodate a larger board. Larger board in the instance of oil and gas quoted companies in Nigeria may be suitable for achieving the goal of higher audit quality.

Keywords: Audit quality, Board Size, Board Independence, Board structure and Corporate governance.

Introduction

In Nigeria and the rest of the global economy, the place of corporate governance mechanisms in disciplining management and ensuring audit quality has been a topic of active debate among accounting researchers, regulators and corporate governance reformists. This active debate and renewed interests in corporate governance mechanisms stemmed from the fact that owners of wealth and other stakeholders have interest in the ability of firm to maximize wealth and ensuring that their investments are monitored and secured. Thus, stakeholders desire assurance in the form of quality audit showing the undisputable state of affairs of their wealth and investments. In this regard, Tulus (2018); Uwuigbe, Eluyela, Uwuigbe, Obarakpo and Falola (2018) argued that

corporate governance mechanisms were systems which encompassed standards of accounting and auditing designed to keep track of management and boost transparency of corporate information.

In addition, Hassan, Aljaaidi, Abidin and Nasser (2018) and Zureigat (2011) viewed corporate governance mechanisms as significant approaches designed to compel management to act on ensuring and protecting the interests of all stakeholders which in turn should lead to resolving agency problem and minimizing its costs. However, despite the governance mechanisms put in place by firms, they are still beset by corporate scandals which have pushed up the demand for high quality audit. Audit quality, according to Dwekat, Mardawi and Abdeljawad (2018) and Kiran and Bomi (2019) play an imperative role in plummeting information asymmetry and mitigating agency problems between managers and stakeholders of firms. Kiran and Bomi (2019) asserted that audit quality was the extent to which auditors adhered strictly to auditing standards and professionalism in the discharge of their duties. This implies that audit quality brings about a scenario where auditors execute their duties with due repute for professional care, independence and competence.

In Nigeria, the emphasis on the need for effective corporate governance mechanisms sprang up with the incidence of fraudulent financial reporting, concealment of debts, and overtrading, such as the case of African Petroleum (AP) Nigeria Limited, among others. Perhaps, corporate failure ensuing from the demise of these firms kept corporate governance mechanisms on the lens thus, making stakeholders to place a high demand on quality audit. Numerous cases of corporate failures were an indictment on corporate governance mechanisms and audit quality.

In Nigeria, the oil and gas sector is made up of the upstream (oil exploration, prospecting, development and production firms) and downstream (marketing) sectors. The major investors in the oil and gas sector are the International Oil Companies (IOCs) (Anugwom, 2019) and the leading sector providing the bulk of government revenue in Nigeria. In view of the fact that the oil and gas sector occupies a vital role in stimulating economic growth in Nigeria, the collapse of firms in this sector usually affects the economy. Given this background, this study sought to examine board structure mechanisms, particularly board size and independence with a view to determining their effect on audit quality of publicly quoted oil and gas firms on the Nigerian Stock Exchange (NSE).

Theoretical Framework

This study is anchored on the agency theory; the "model of man" underlying agency and organizational economics is that of a self-interested actor rationally maximizing his own personal economic gain. Although the model is individualistic, it is predicated upon the notion of an in-built conflict of interest between owners and managers of wealth of firms (Donaldson & Davies, 1991). The agency theory is defined as a relationship under which one or more persons (principal) and another person (agent) perform some service on their behalf and delegate some decision-

making authority to the agent. Within the framework of a corporation, agency relationship exists between the shareholders (principal) and the firm's executives and managers (agents).

Vladu and Matis (2010) posited that owing to the separation of ownership from management, a conflict of interests would arise since the root of opportunistic behaviour was considered to be located in the problems that the theory raised knowing that the particular theory was seen as a theory of conflicts between managers and shareholders. Jensen and Meckling (1976) refined the agency problem as effective corporate governance which increased public confidence in a corporation and lowered the cost of capital for investment, audit and financial reporting quality. Within the framework of a corporation, agency relationship exists between the shareholders (principal) and the firm's executives and managers (agents). Thus, the agent is expected to act in the best interest of the principal, but on the contrary the agent may not make decisions on the principal's interest. The agency problem was highlighted by Ross and presented by Jensen and Mecklin (1976).

There are three types of agency costs as observed by Jensen and Meckling (1976) and Matis (2001), bonding, residual and monitoring costs. *First,* the bonding cost entails the expenses associated with appointing external auditors (for purpose of realizing audit quality) for careful scrutiny of governance principles; *second,* residual costs are expenses related to appointment of independent board for monitoring firm's activities and in carrying out social responsibilities; *third,* monitoring costs are pervasive costs which are borne by shareholders initially for supervising the activities of management. According to Al-Malkawi and Pillai (2012), an efficient management incurs less monitoring costs in order to improve the wealth of shareholders.

The motivation to investigate the association between corporate governance mechanisms and audit quality can be seen from a dual perspective (Vladu & Matis, 2010; Shil, 2008). *First,* in accordance with theories of costs, management has an incentive to choose a level of governance to ensure compliance with all regulations for investors' protection. *Second,* consideration should be accorded to the best governance practices, such as improved communication and a low level of vulnerability may cause investors to demand a lower risk premium, and managers can obtain an incentive to increase the efficiency, on a voluntary basis, of the company's governance practices with some low implementation cost. Thus, audit quality is significantly influenced by the form of implemented corporate governance, respectively the decision makers' ability to identify and harmonize the interests of the most significant social partners.

Shil (2008) posits that, effective corporate governance increases public confidence in a corporation and lowers the cost of capital for investment as well as audit and financial reporting quality. For developing the activity under high competitiveness, management should avoid potential conflicts between all stakeholders and, more, consider and harmonize them in order to have effective corporate governance that produces quality audit. The theoretical perspective guiding this current study is linked with the view that corporations with efficient corporate governance structure will have a better audit quality than those without it.

Review of Related Literature

In accounting literature, the role of board structure mechanisms in increasing or reducing audit quality has been a subject of concern in recent times. Emphasis of this study is placed on specific board structure mechanisms such as board size and board independence.

Board Size

Board size is simply the total number of directors sitting on an organization's board at a particular time. It is often said to be an imperative element in determining the viability of the board. The term, board size, is a vital element of corporate governance and it refers to the total number of directors on the boards. Allegrini and Greco (2013) noted that the board's vital functions consisted mainly in evaluating decisions along with controlling executives; the optimal size for a board should not be more than nine (9). Contrarily, Pearce and Zhara (1992) suggested that when the number of board members was higher, the control capacity and audit quality would be augmented.

A reduced number of directors in the board imply high degree of coordination and communication between them and managers. Indeed, Bradbury, Mak, and Tan (2006) found that larger board size reduces the information content of incomes and increases earnings management. Beekes, Pope, and Young (2004) note, however, that higher number of board size ensures the value relevance of financial statements, given the fact that larger board size will have relevant, experienced and skilled board of directors. Samaha, Khlif and Hussainey (2015) also report that firms with larger boards are more probable to disclose a greater deal of corporate governance information than smaller board. Allegrini and Greco (2013) document that larger boards usually tend to disclose more accounting information that contributes to improved audit quality than smaller ones.

In the view of Dimitropoulos and Asteriou (2010), larger boards are more efficient than small ones in monitoring and controlling the financial communication quality. Hence, when number of board members is higher, the control capacity and audit quality would be enhanced. Thus, this study expects a positive relationship between board size and audit quality, given the large number of directors on the board since they are skilful/experienced to take on accounting and all-related disclosures of oil and gas companies matters.

Board Independence

Board independence constitutes a major control mechanism argued in corporate governance-related research. Board independence refers to the capacity of the board to act, in mind and in appearance, objectively without any form of influence. Thus, an independent board can be deemed as a vital specification in any active corporation; since such independence can ensure audit quality. Board independence is gauged as the number of non-executive directors divided by the total number of directors on the board. In practice, board independence is free from the control and manipulations of the chief executive officer since it encompasses outside directors (Fama & Jensen, 1983).

Hermalin and Weisbach (1991) explained that suitable compositions of board of directors helped in reducing agency problem. An independent director is a non-executive, shareholder of an organization whose interest or shareholding, directly or indirectly, does not exceed 0.1% of the organization's paid-up capital. An independent director must not be previously employed or have any business or professional relationship with the organization. The fundamental responsibility of the director on the board is to reduce agency costs through monitoring the activities of management in the interest of shareholders. Independent directors are said to have a stronger and extended engagement with the wider groups of stakeholders.

Audit Quality

A variety of definitions has been accorded to audit quality. Knechel, Krishnan, Pevzner, Stefchik and Velury (2013) noted that there is little consensus among researchers regarding the definition of audit quality; in accounting literature, audit quality is seen in relation to observing audit standards. Contrarily, accounting researchers consider multiple dimensions for audit quality, which often leads to seemingly diverse definitions of audit quality. The most common definitions of audit quality revolves around certain elements, the likelihood of significant errors in financial statements of entities that auditors are able to decipher; the probability that auditors might not issue conditional report for financial statements containing fundamental errors; an assessment of auditor's proficiency to reduce biased errors and misstatements in order to enhance accounting data quality; and the accuracy of the information about which auditors have made reports. This portends that these elements of audit quality definition emphasize auditors' competence and independence in the audit (true independence) and the perception of their independence by the users of financial statements.

One of the utmost or common definitions of audit quality is the one proposed by De-Angelo (1981). De-Angelo (1981) defines audit quality as the market assessment of the likelihood that auditors might discover material misstatement in financial statements of the audit-client, and that he will report the discovered material misstatement without any form of bias. De-Angelo's definition captures a critical aspect of the perception of the effect of auditing on financial statements. In the first part of De-Angelo's definition, audit quality is viewed in the context of auditor's competence to discover misstatement, which is subject to the auditor's independence. Given the fact that the definition by De-Angelo does not capture all elements of audit quality, other definition of audit quality sprung up. To Palmrose (1988), audit quality relates to the auditor accreditation. In the view of Palmrose (1988), since the auditor aims to make financial statements reliable, audit quality means the audited financial statements' being free from material misstatement; this definition emphasizes the audit results.

Watkins, Hillison and Morecroft (2004) linked the definition of audit quality to risk of failure to modify audit reports of financial statements that contain material misstatements. The goal of the external audit is acknowledged by the International Auditing and Assurance Standards Board and American Institute of Certified Public Accountants as obtaining reasonable assurance regarding

whether the reported financial statements of corporate entities are free of material misstatements, and communicating such results to interested parties (Rittenberg, Johnstone & Gramling, 2010). The import of this function therefore stems from the reliance of capital market investors on audited financial reports when making business decisions (Willenborg, 1999; Epstein & Geiger, 1994).

Investors in the capital market perceive audit quality as an indication of reliability and accountability of reported financial statements (Schmidt & Wilkins, 2011; Ghosh & Moon, 2005). However, audit quality cannot be observed due to the fact that the only outcome of the audit process is the audit report. Even though an audit report is all-purpose template for firms and most audit reports are standard, audit quality variation do exist and can be spotted by comparing diverse groups of auditors. Perhaps, this is one of the reasons for the early recognition of size of audit firms as audit quality indicator used in accounting literature.

De Angelo (1981) argued that the larger the audit firm size, the higher the audit quality for the reason that having a large number of audit clients makes it less probable for an audit firm to compromise their independence or reputation. In line with De Angelo's (1981) argument, some researchers (Simunic & Stein, 1987) argued that Big-N audit firms are weightily invested in their brand name and thus have incentives to provide higher audit quality so as to protect their reputation. The axiom is that Big-N audit firm can provide higher audit quality since their size enables them to provide more training programs, diverse audit methodologies and options for appropriate partner reviews (Francis, Michas & Yu, 2013).

Contrary to the views of De-Angelo (1981), Simunic and Stein (1987); Francis *et al* (2013) on audit quality, there is evidence in accounting literature that fees of Big-N audit firms carry a premium relative to other audit firms (Andre, Broye, Pong & Schatt, 2011; Francis, 1984) and that this premium reflects the quality of services rendered by these auditors. In addition, audit clients are willing to pay higher fees for higher audit quality so as to reduce information asymmetry between management and stakeholders (Clatworthy, Makepeace & Peel, 2009). However, studies on audit quality have been undertaken in milieus that demand a single audit engagement.

Empirical Studies

This section provides a review of some empirical studies on board structure mechanisms and audit quality. In Tunisia, Bacha (2019) evaluated ownership structure, board size, ownership concentration, independence of audit committee, as well as the reputation of external auditor on cost of debt of Tunisian listed firms over the period 2007-2016. The ordinary least square (OLS) regression result showed that cost of debt is inversely related to director board size and ownership concentration. In addition, the study found evidence of a debt pricing impact of audit quality (measured by Big-4) and however reports that board composition and presence of managerial shareholder and independence of audit committee have insignificant impact on cost of debt.

In Romanian, Andra (2019) explored the link between audit quality and corporate governance attributes. Corporate governance measures of board independence, managerial ownership, chief

executive officer duality, institutional ownership and audit committee existence were obtained for the period 2008-2012. The study showed that there is a negative link between audit quality and CEO duality, on one hand, and institutional ownership, on the other hand. Besides, a strong positive link was found between audit quality and existence of audit committee while there is no link between audit quality and board independence, as well as managerial ownership.

A study by El-Maude, Bawa and Shamaki (2018) examined the impact of board size, board composition and board meetings on financial performance (measured by return on asset) of listed consumer goods in Nigeria from 2006-2015. The data obtained were analyzed using correlation and regression statistical tool. Findings showed that board size negatively and significantly financial performance while board composition and board meeting positively and significantly affect financial performance. The outcome of this study is that the smaller the board size, the more efficient the board would be.

Similarly, Sihar, Riris, Ingrid and Ayu (2017) investigated the effect of corporate governance on audit and earnings qualities moderated by firm. Corporate governance measures of board size, concentrated ownership, audit quality (measured by amount of audit fees), and firm size (measured by natural log of total assets) were employed during 2010-2015. The multiple panel data regression analysis revealed that board size and audit quality has insignificant effect on earnings quality. However, concentrated ownership has a negative effect on earnings quality. In addition, firm size has a significant positive effect on earnings quality. Meanwhile, firm size is not able to moderate significantly the effect on board size and earnings quality.

In Nigeria, Ejegbasi, Nweze, Ezeh and Nze (2015) assessed the nexus between corporate governance and audit quality of the banking industry from 2007-2014. Correlation analysis was employed and results indicated that while board composition has a negative and insignificant nexus with audit quality, separation of CEO role from that of the chairman of the board, board size, and composition of audit committee has positive and significant nexus with audit quality. Moreover, there are indications that ownership concentration has a positive but insignificant nexus with audit quality but the strength of positive linear nexus between separation of CEO role from that of the chairman of board and audit quality was significant and relatively high.

Research Methods

The study adopted an *ex-post facto* research design using certain variables of corporate board structure mechanisms such as board size and board independence and audit quality. The study population comprised of all oil and gas companies quoted on the floor of the Nigerian Stock Exchange (NSE) during the period 2000-2019. In the oil and gas sector, there were thirteen (13) publicly quoted oil and gas companies as at 31st December, 2019 (Nigerian Stock Exchange, 2019).

The empirical model for this study was based on corporate board structure mechanisms which include board size and board independence as they affect audit quality. In addition, the study model was informed by prior researchers of Amel and Anis (2014), Gacar (2016), Salehi, Moradi and

Navid (2017), and Kee, Hock and Kwong (2017); Sihar et al., (2017). Tulus (2018), and Andra (2019). Given the above, a multiple regression model was employed. In expressing the functional form of the audit quality model, the following model emerged:

Audit quality = f (board size, board independence) ……. (1)

However, the econometric specification of the functional form above was represented in the equation below as:

$aquality_{it} = \beta_0 + \beta_1 bsize_{it} + \beta_2 bind_{it} + \beta_7 fsize_{it} + e_{it}$ *…. (2)*

Where; aquality = Audit Quality; bsize = Board Size; bind = Board Independence; fsize =firm size; "i" = Cross Section (Sample Companies); "t" = Time Frame; e_{it} =Stochastic error Term

Table 1 Variables Measurement and Justification

S/N	Variables	Description	Studies that Employed the Variables
1.	Board size	This is measured by the number of directors on the board.	This variable has been used by Zahid (2020)
2.	Board independence	Number of non-executive directors divided by total number of directors seated on the board.	This variable has been employed by Andra (2019)
3.	Audit quality	Statutory audit fee divided by sales revenue.	Kee, *et al* (2017); Sihar *et al* (2017); and Matoke and Omwenga (2016) measured audit quality using audit fee
4.	Firm size	The natural logarithm of year-end total assets.	Firm size as a control variable have been used by prior studies in other countries except Nigeria in the nexus between corporate governance mechanisms and audit quality. These studies among others include Firnanti, *et al* (2019); and Sihar, *et al* (2017)

Source: Researcher's Compilation, 2021

In this study, panel data and ordinary least square (OLS) estimation technique was the employed data and analysis was in sections: descriptive statistics (mean, standard deviation, minimum and maximum value, and normality tests) and inferential statistics (fixed and random effects and Feasible Generalized Least Square). Nevertheless, Hausman specification test was done in order to determine whether fixed or random effect is more efficient. A-priori expectation is that corporate board structure mechanisms will significantly affect audit quality of publicly quoted oil and gas firms in Nigeria; the analysis was done via STATA 13.0 version.

Result of the Findings

The descriptive statistics showed in the tables below provided a good insight into the nature of the selected Nigerian quoted oil and gas companies that were employed in this study.

Table 2: Summarized Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
aquality	156	.0324198	.1831917	0	1.494627
bsize	160	8.75625	2.412616	0	16
bind	159	.597293	.1486391	0	1
fsize	159	7.338176	.8344405	3.45	8.95

Source: Authors Computation 2021 via STATA 15.0 Software

The table above showed a summary of the descriptive statistics of the study. As observed, the average of the variable of audit quality was 0.032 while the standard deviation was 0.18 and the minimum and maximum values were observed to be 0 and 1.49 respectively. However, an expanded analysis shown in appendix (1) revealed that in year 2000, audit quality was 0.0002 and was the same in year 2001. Audit quality increased from 0.0016 in year 2000 to 0.1884 in year 2003. However, between years 2004 and 2019, audit quality decreased from 0.1691 in year 2004 to 0.1176 in year 2005, 0.0616 in year 2006, 0.0634 in year 2007 and 0.0002 in year 2008. Audit quality for the sampled firms fluctuated from 0.002 in year 2013, 0.001 in year 2014, 0.002 in year 2015, 0.004 in year 2016, 0.008 in year 2017, 0.004 in year 2018 and 0.011 in 2019. Particularly, the study found that JaPaul Oil and Maritime Services had the highest value for audit quality 0.27 while Con Oil had the lowest value for audit quality during the period under investigation.

Furthermore, the study observed that the average board size for the oil and gas firms under study was 9 members and a maximum number of 16. A more detailed analysis of the descriptive table could be seen in the Appendix which revealed that on average, board size increased from 9 members in 2000 to 10 in 2001 and then reduced to 9 in 2002, 2003 and 2004. The minimum number of members on the board decreased from 7 in year 2000 and year 2001 to 6 in year 2002, and 5 in year 2003. The study found that the minimum board size for the sampled firms stayed at 5 members in years 2004, 2005 and 2006. But in years 2007 and 2008, the minimum number of board members remained at 8. The maximum number of board members for the oil and gas firms under study rose from 12 in year 2000 to 16 in year 2001, and then reduced from 15 in year 2002 to 11 in year 2003. The highest number of board members that was recorded in year 2000 was 16.

Board independence, on average was observed to be 60% from the summarized descriptive statistics table. A more detailed descriptive statistics table in the Appendix showed that board independence increased from 55% in year 2000 to 57% in year 2001. A further increase was observed from 61% in year 2002 to 62% in year 2003. However, it recorded a decrease to 60% in year 2004. Board independence was the highest in year 2019 (67%), closely followed in year 2018 (66%) while the lowest board independence was observed in year 2007 (54%). Board independence, on average was observed to be 60% from the summarized descriptive statistics table. A more detailed descriptive statistics table in the Appendix showed that board independence

increased from 55% in year 2000 to 57% in year 2001. A further increase was observed from 61% in year 2002 to 62% in year 2003. However, it recorded a decrease to 60% in year 2004. Board independence was the highest in year 2019 (67%), closely followed in year 2018 (66%) while the lowest board independence was observed in year 2007 (54%).

Table 2. Shapiro-Wilk W Test for Normality of Residual

Variable	Obs	W	V	z	Prob>z
aquality	156	0.17028	99.846	10.458	0.00000
bind	159	0.94596	6.611	4.295	0.00001
ceoown	159	0.05952	115.043	10.791	0.00000
bsize	160	0.99235	0.941	-0.138	0.55477
fsize	159	0.86526	16.482	6.372	0.00000

Source: *Authors Computation 2021 via STATA 15.0 Software*

From the results obtained above, the study found that audit quality (Prob > z = 0.00000) as the dependent variable of this study was statistically significant at 1%, hence, it was not normally distributed. Similarly, all the independent variables of interest were not normally distributed except for the variable of board size (0.55477), which was obtained from probability z statistics revealed in the table above. The study justified the interpretation following the study by Bera and Jarque (1982).

Table 3: Fixed and Random Effect Audit Quality Model

Variables	**Board Size**	**Board Independence**	**Firm Size**
Coefficient	-0.027	-0.461	-0.060
t_ Statistics	(-3.54)	(-0.61)	(-3.54)
Probability_t	{0.001}**	{0.545}	{0.001}**
Coefficient	-0.018	-0.056	-0.445
z_ Statistics	(-3.33)	(-0.75)	(-2.93)
Probability_z	{0.001}**	{0.451}	{0.003}**

No. of Obs = 156	**Prob. Wald Chi^2 = 0.0000**	**R^2 = 0.4660**
No. of Obs = 156	**Prob. F statistics = 0.0000**	**R^2 = 0.4980**

Hausman = 0.9182

Note: t & z -statistics and their respective probabilities are represented in () and {}
Where: *** represents 1% & ** represent 5% level of significance
Source: Authors Computation 2021 via STATA 15.0 Software

The fixed and random effect regression estimation for audit quality model displayed above revealed the coefficient, standard error, t-statistics value, probability of the t-statistics, R - Squared

as well as 95% confidence interval level of all the independent variables of interest. Furthermore, the study provided the result of the hausman specification test which enabled us to determine which among the twin model was most appropriate. A careful examination of the result provided by Hausman specification showed that the random effect model was appropriate for use. However, the study confirmed the result by taking a look at the p-value (0.9182) which implied that the acceptance of the null hypothesis since the p-value was not significant at 5% level. In a bid to validate the results obtained from the random effect model, some vital panel random effect diagnostic tests were carried out as suggested by Woodridge (2010). Hence, the study tested for group-wise heteroscedasticity, cross section dependence error and first order auto-serial correlation since the time period for the study was greater than 15years after which violation of these crucial assumptions gives room for spurious regression estimates (Woodridge, 2010).

Specifically, the study employed the "xtreghet" option which was the Maximum Likelihood Estimator (MLE) in Stata 15 to check for groupwise heteroscedasticity in the random effect model. Furthermore, the study employed the Pesaran's test of cross-sectional independence and lastly, the test for first order auto-serial correlation was carried out by employing Wooldridge test for autocorrelation in panel data.

Table 4. Test for Groupwise Heteroscedasticity in Random Effect Model

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==========================================================================
* Panel Groupwise Heteroscedasticity Tests
==========================================================================
  Ho: Panel Homoscedasticity - Ha: Panel Groupwise Heteroscedasticity

- Lagrange Multiplier LM Test     = 4.48e+04     P-Value > Chi2(7)   0.0000
- Likelihood Ratio LR Test        = 207.7197     P-Value > Chi2(7)   0.0000
- Wald Test                       = 3.71e+05     P-Value > Chi2(8)   0.0000
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Source: Authors Computation 2020 via STATA 15.0 Software

The standard error component panel data model assumes that the disturbances have homoscedastic variances through the random individual effects (Hsiao, 2003; Baltagi, 2008). These are restrictive assumptions for a lot of panel data applications. For example, the cross-sectional units may vary in size, and as a result, may exhibit heteroscedasticity. According to Hsiao (2003), 'it is only by taking proper account of selectivity and heterogeneity biases in the panel data that one can have confidence in the results obtained. Hence, to satisfy this assumption which gives credence to the results, the residuals should have constant variance.

From the result displayed in the table above, it was observed that all the test criteria employed to check for the presence of panel group-wise heteroscedasticity in the model were seen to be significant at 1%. It was seen from the P-values of 0.0000 for all three different criteria that were adopted - Lagrange Multiplier LM Test, Likelihood Ratio LR Test and the Wald Test. For that reason, the study accepted the alternative hypothesis for the presence of panel group-wise heteroscedasticity in the random effect model.

Table 5: Feasible Generalized Least Square (FGLS) Audit Quality Regression Model

Variables	**Board Size**	**Board Independence**	**Firm Size**
Coefficient	-0.018	-0.056	-0.044
t_ Statistics	(-3.42)	(-0.77)	(-3.01)
Probability_t	{0.001}**	{0.439}	{0.003}**

Wald Chi^2 Test = 182.91 Probability = 0.0000

Note: t-statistic and probability t-statistics are represented in () and {} respectively

Where: *, ** represents 1% and 5% level of statistical significance**

Source: Authors Computation 2020 via STATA 15.0 Software

Table 5 showed the results obtained from the feasible generalized least square regression employed to correct for regression violations (panel group-wise homoscedasticity and auto serial correlation) observed in the random effect model. The model goodness of fit as captured by the Wald statistics (182.91) with the corresponding probability value showed a 1% statistically significant level. It revealed that the entire model was fit and could be employed for discussion and policy recommendation.

In view of the result obtained from the FGLS regression for the audit quality model of oil and gas quoted companies in Nigeria, the study found that board size had a significant negative effect on audit quality during the period under consideration. That was evident from the variable of board size with coefficient = -0.018, z_statistics = -3.42 and Probability z = 0.001. Clearly, the result indicated that increasing board size by one director would lead to a poorer audit quality. On the other hand, the study revealed that board independence had an insignificant effect on audit quality during the period under consideration. That was evident from the variable with coefficient = -0.056, statistics = -0.77 and Probability z = 0.439.

Discussions

The board of directors' roles in the governance of modern firms are crucial taking into consideration its influencing position. Hence, understanding board size has been identified as helpful and an effective factor in decision making. Both small and large size boards have been discussed in the literature, but majority of studies had highlighted the effectiveness of a small size board of directors. For example, Jensen (1993) posited that in terms of communication and coordination problems, larger boards of directors could lead to more loss than small size ones, thereby, the effectiveness of the board as well as firm performance may decline. Jensen (1993) notes that when firms were smaller, independence of boards could be increased because of their small size; hence, small boards have a greater proportion of independent directors which can result in increasing the monitoring functions.

Particularly, the study findings negated the position held by Jensen and Mackling (1976) who noted that an increment in board size would enhance an organization's adequacy to bolster management in significantly reducing agency cost which resulted from poor management. They noted that the increase would benefit the organization, but only when the number of directors was more than eight or seven (Ejeabasi *et al,* 2015; Jensen, 1993) which was likely difficult to coordinate. They extended their argument noting that larger boards were capable of giving more time and effort to check the management's actions. However, our result supported the findings of Zona, Zatton and Minichilli (2013) who argued that the benefits of a higher level of monitoring by a huge board may be nullified because of poor decision making by a large board. Hence a small board was believed to alleviate the processing problems and effectively enhance board monitoring function. Furthermore, our result as evident from variable of board size with coefficient = -0.018, z_statistics = -3.42 and Probability z = 0.001.

The fundamental responsibility of the director on the board is to reduce agency costs through the monitoring of the activities of management in the interest of shareholders. Independent directors are said to have a stronger and extended engagement with wider groups of stakeholders. However, the outcomes of this study negated those by Salleh, Stewart and Manson (2006) who argued that boards with a higher percentage of outside directors would seek higher quality auditors in order to provide more effective monitoring of corporate management. Salleh, Stewart and Manson suggested that independent directors encouraged more intensive audits as a complement to their own monitoring role. A higher proportion of independent and non-executive directors on the board had the likelihood of inducing a more effective monitoring function which could lead to more reliable financial statements or reports. However, the results obtained from this study as evident from the variable with coefficient = -0.056, z_statistics = -0.77 and Probability z = 0.439.

Conclusion

Corporate governance is a widely researched topic in the accounting and finance literature. Corporate boards are the heart of corporate governance in which shareholders give authority to the board to monitor and control activities and decisions made by management. There are two opposite classes of thought for the structure of the board to be effective in an organization. One class believes that the purpose of the board is to minimize agency costs through approval and monitoring of management's behaviour tending to harmonize managers' interest with owners' interest. On the other hand, the second class argues that the board should be structured in a way to maximize the managerial control of the firm.

This study aimed at evaluating corporate board mechanisms and audit quality of quoted oil and gas companies in Nigeria. The scope of this study covered a 20year period, ranging from 2000 to 2019. The independent variables of interest which were employed in other to ascertain the possible effect of corporate board structure on audit quality included board size and board independence. One control variable of firm size was adopted from related extant literature to help improve the reliability of the study's specified models. Pre estimation analysis which included descriptive

statistics, correlation matrix and normality of residual analysis was conducted and the study concluded that while board size significantly affects audit quality, the opposite was the case for board independence.

Recommendations

Based on the findings, the study made the following recommendations;

First, the study recommended a rethink of accomodating larger boards. Larger boards, in the instance of the oil and gas quoted companies in Nigeria, may not be suitable for achieving the goal of a higher audit quality. However, the study made those recommendations with caution noting that if the objective of managers was to improve on the quality of audit, then small sized boards (at most seven members) could be consistuted.

Second, that the board independence should be enhanced in order to ensure audit quality; as a matter of fact, the independence of the board could guaratntee a check and balance in the activities of management and other stakeholders of companies.

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