IMPACT OF AUDITOR INDUSTRY SPECIALIZATION ON THE AUDIT QUALITY OF LISTED NON-FINANCIAL FIRMS IN NIGERIA

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Abstract

Audit quality improvement depends on several factors documented in the literature. Auditors are able to attract patronage if clients perceive their services to produce quality outcomes. Auditors therefore garner experience and acumen in the activities of specific clients' industries in order to attract the largest market share and improve their portfolio of clients in certain industries as a result, they attain the status of 'specialization' in the audit of such industries.. In spite of this 'specialization', indices of dwindling audit quality continues to surface in the corporate entities occasioned by untimely takeovers and abrupt mergers. Therefore, this study examines the nexus between audit industry specialization and audit quality in the listed non-financial firms in Nigeria Data were drawn from financial reports of 40 listed firms in Nigeria covering periods between 2005 and 2019 and the total observation stood at 517. Data analysis was carried out with the use of longitudinal econometric models. Evidence from the study support the rejection of the null hypothesis ($t=-1.72$, $p<0.10$ & $t=-1.74$, $p<0.10$) for the two models thereby supporting the proposition that audit quality improved significantly improved as a result of audit industry specialization. It specifically isolates the oil and gas as well as service industries for significant improvement in audit quality as a result of industry specialization of auditors while pointing to the possibility of improving the agricultural and consumer service industries due to their negative but insignificant coefficients. The study recommends that regulatory authorities should disaggregate regulatory functions among industries to be able to better understand the interplay of audit industry specialization and thus make policies that inform better audit quality.

Keywords: Audit Industry Specialization, Audit Quality, Discretionary Accruals, Non-Financial Firms.

1. INTRODUCTION

The International Standards on Quality Control (ISQC) 1 gives consideration for firms' engagement of professional staff with requisite qualities. These include, amongst others, understanding and acumen of the client industry, and understanding of the regulatory environment and reporting needs of specific client industry. These requirements are necessary to build the needed competencies for the audit of financial reports in such industries (Association of Chartered Certified Accountants ACCA, 2020). In the accounting literature, such issues border around auditor industry specialization which appears to be technically identified by large audit firms in staff placement and departmentalization of operations. Auditor industry specialization is among the major determinants of audit quality (Fuentes & Sierra, 2015; Ghafran & O'Sullivan, 2017; Willenborg, 2002; He, Pittman, Rui, & Wu, 2017) especially as large audit firms appear to feature prominently in large scale audit mistakes recently. The developed economies experience audit mishaps as much as other economies in spite of the specialization claims of their auditors in clients' industries, stringent regulatory environment and prominent audit firms. The Involvement of Ernst and Young in scandalous reports of the management of the erstwhile Thomas Cook in 2017, United Kingdom; Ted Baker's overstatement of £25m inventory undiscovered by KMPG in 2018 (Skoulding, 2018), Financial Reporting Council's (2015) review audit of Stanbic IBTC holding by KPMG in Nigeria among several others are notable in this discourse.

According to the United State Government Accountability Office (2008), audit firms with expert professional who possess industry understanding and acumen may be able to employ its audit specialization skills in marketing audit and non-audit services specific to their clients in the industry and improve quality through the provision of a higher level assurance. Auditors' mistakes are expected to reduce if auditors harness specialization through requisite expertise and experience before embarking on the audit. The Big 4 audit firms in Nigeria, adequately entwined with requisite specialization and presence in all industries, conduct the periodic audit of almost all listed companies in the country (World Bank, 2011) and command the audit market with growing revenue annually. The quality of audit in Nigeria therefore relies majorly on the quality of the Big 4 **(**Uthman & Salami, 2021). Others, small and medium-size audit practitioners, lack access to quality and recent training on applicable accounting and auditing standards which has limited their ability to have a spread of industry-specific knowledge in auditing as well as a good share of the

audit market (Oyewo, 2020; Bakre, McCartney & Fayemi, 2021; Uthman & Salami, 2021; World Bank, 2011).

Incidentally, Nigeria has experienced some high profile corporate financial scandals that query the quality of audit reports bandied by the Big 4 audit firms in the recent past. Classical instances include the complicity of KPMG in Stanbic IBTC infraction in 2014 (FRCN, 2015), the widely reported suspension of the OANDO board despite their long-standing audit by the Big 4 audit firms (Securities and Exchange Commission, 2019) as well as Federal Government parastatals' infractions unveiled by the Office of the Auditor General of the Federation (Oladipo, 2022) despite the involvement of external professional auditors in their audits. As a result, the spread of industry-specific knowledge and expertise in the audit sector do not preclude the spread of low quality audit.

Oyewo (2020) examines the quality of financial reporting within the context of fair value measurement, providing evidence for the paucity of data in entrenching the objective of IFRS13. Further, Ajape, Alade and Agbaje (2021) provided evidence of significant effect of auditor independence, experience and accountability on audit quality. Despite the relevance, possible effects of industry specialization was not captured in the studies. This niche is also observable in the studies of Bakre (2021), Oyewo, Ajibola and Ajape (2020), Oyewo, Emebinah and Savage (2019) and Ozili (2021). Thus, audit industry specialization in Nigeria amid reported cases indicating possible weak quality has rarely attracted the attention of researchers. This study extends academic argument adopting longitudinal approach to examine the interaction of audit industry specialization with audit quality intertwining audited annual report data across all industries with specific market and portfolio shares of auditors industry specialization.

2. LITERATURE REVIEW

2.1 Audit Quality

The ownership-management gap inherent in modern day business has precipitated the notion of "self-serving" bias on the part of the management, thereby requiring an oversight on the activities of the management in discharging the stewardship bestowed on them. The attestation of external auditors after a compulsory periodic audit is the means through which shareholders get assurances with regards to the fidelity of figures in the annual financial reports. Traditionally, it is

considered as the examination of financial statements to ensure conformity with underlying financial statements as the auditor must "obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due rules and the expression of unbiased opinion on the truth and fairness of such statements" (Millichamp & Taylor, 2008). The objective of the auditor is primarily to report on the fraud or error" (Institute of Chartered Accountants of Nigeria, 2013). As a result, professional auditors are usually required to exercise care and due diligence in the conduct of their engagement to ensure users of their reports of the credibility of their attestation of financial statements. The quality of outcome from such process is simply the basis around which audit quality revolves.

Although the quality of audit is a subject of auditor's opinion on the truth and fairness of the information contained in the audited financial report, such opinions are predicated on compliance with underlying accounting principles and standards which are not necessarily exhaustive of the factors that determines quality in practical terms (Francis, 2011). However, DeAnglo (1981) views audit quality as one that considers experience and competence of auditor in the use of judgement with integrity, skepticism and objectivity adequate enough to attract public reliance and safeguard the investors' capital through avoidance of material misstatement. While both views of audit quality expressed above are by no means contradictory, they serve a complimentary role of ensuring an expression of truth and fairness imbued in the application of necessary expertise and care. As such, audit becomes quality as it informs the joint possibility of reporting discovered accounting system breached of a firm thus improving the quality of financial reporting (DeAnglo, 1981).

The regulatory perception of audit quality keenly submits to the views expressed by Francis (2011) and DeAnglo (1981). Accordingly, the framework of audit quality issued by the International Auditing and Assurance Standard Board (IAASB) (2018) alludes to the view that; while the expression of opinion on financial statement is the key objective of financial statement audit, exhibition of certain values by the engagement team will likely enhance the quality of audit. Such values encompass exhibition of values, ethics, enough knowledge, attitude, skill, experience, sufficient time, audit rigour and appropriate interaction. The view is equally entrenched by the Audit Quality Disclosure Framework of the Center for Audit Quality (2019) with an extension of

the need to provide both quantitative and qualitative information that the auditor may find useful in communicating audit quality.

2.2 Auditor Industry Specialization

Given the evolution of automation as occasioned by information and communication technology, the pace of improvement and dynamism in methods of achieving tasks could best be described as moving at geometric rate. Globalization has emerged through the shrink of terrestrial and international boundaries as well as seamless transfer of professional acumen across geographic locations. These developments and events have reshaped the touch of expertise in job performance. Traditional jobs, accounting inclusive, have benefited immensely from this new normal as our age of global consumerism usually promote the culture of remote working which ensures the culture of "working with anyone, anytime, anywhere" (Ericsson et al, 2006).

However, specialization in a discipline has historically been a function of expertise and experience as explained by the learning curve theory. Learning curve theory explains a way to identify the rate of improvement by which a job is performed over time. It rests on the logic that; individuals get better in job performance given the opportunity to do the same task repeatedly over time. This theory was popularized by T.P Wrights in the 1920s to accurately predict how much labour time will be required to produce aircraft in the future (Steven, 2010). Extending the relevance of learning curve to financial audit, Craswell et al. (1995) espoused that the only way to ensure audit quality is for auditors to harness specialized knowledge and experience to supplement the traditional accounting and audit acumen in specific fields. To the IAASB (2018), an auditor that has industry expertise and experience attains the industry's specialization and brands it to entrench its market for clients (U.S. Government Accountability Office, 2008).

Accordingly in the accounting literature, (See, Ashton, 1991: Gramling & Stone, 2001; Hammersley, 2006) audit specialization is conceived as a joint outcome of expertise training and long-standing audit experience attained from conducting the audit a specific industry. Hence, auditing knowledge acquired through such experiences increases the possibility of the ability to perform good quality audit. Neal and Riley (2004) developed a quantitative metric for the measurement of audit industry specialization as 'market share' and 'portfolio share'. They explained that the market share of an auditor in an industry represents that largest knowledge of

the particular industry, harnessed through reputation that has been built over years. The portfolio share approach on the other hand considers audit client firm that generates the most revenue among other audit firms in the industry. Extending the frontier of these operationalization, Minutti-Meza (2013) discovered that both models have inherent faults in operationalizing audit firm specialization. As a result, Fleming, Hee and Romanu, (2014) provided evidence to suggest that overcoming the problems associated with the existing metrics of auditor industry specialization requires a product of the two existing models as a single metric for the quantitative measurement of audit specialization. They believe that this overcomes the problems identified with the models and as well captures auditor-specific and firm-specific factors of auditor industry specialization.

2.3 Empirical Review and Hypothesis Development

Auditor industry specialization has been observed from different perspectives with mixed results. Fleming et al. (2014) examined its effect on audit fees amid section 404 of SOX and found evidence that it mitigated significant increase in audit fees that occurred during the first year of SOX implementation while at the same time discovered that such mitigation with auditor industry specialization during the implementation did not persist in the second year of the compliance. In contrast, Scott and Gist (2013) found a positive association between audit fee and industry specialization even though their study was conducted in response to forced auditor change after Arthur Anderson. In spite of the counteractive outcomes of both studies on audit industry specialization, outcome variables in both – audit fee precludes their outcomes from explaining the direct effect of audit industry specialization on audit quality.

Kharuddin, Basioudis and Hay (2019), Bae, Choi and Rho (2016) as well as Zerni (2012) examined how audit fee and pricing is affected by audit partner specialization. Plausibly, results across the studies are similar as they all found an association between increased audit fee and audit partner specialization. Notwithstanding, the studies' outcomes suggest the possibility of other factors leading to increased fees such as increased audit hours associated with specialist auditors, firm expertise at national and local level as the possibility of endogenity. Meanwhile, audit industry specialization was discovered to be indifferent to the relationship between audit tenure and stock price volatility (Jorjani & Gerayeli, 2018), moderate the effect of regulatory standards on audit quality (Petrov & Stocken, 2019), indifferent to the nexus between the quality of audit and cost

efficiencies in homogenous industries (Bills, Jeter & Stein, 2014) and also embeds specific audit risks during financial crises periods (Cassell, Hunt, Narayanamoorthy & Rowe, 2019).

Fanani, Budi and Utama, (2021) conducted a study on audit industry specialization focusing on audit quality and discovered that higher audit quality exists for specialist auditors above their non-specialist counterparts even though their study was restricted to the financial sector. The result presents consistent findings with previous studies including Balsam, Krishnan and Yang (2003) who considered audit industry specialization unobservable and operationalized it with a binary digits of big 6 firm thereby defeating the intent of the study. The study of Petrov and Stocken (2019) also noted a positive response of audit quality to audit industry specialization. But, the study's intent was on how such quality reacts to regulatory standards. Besides, the study excludes data analytics but rely on mathematical probability of hypothetical events.

Carcello and Nagy (2014) identified how specialized audit led to reduction of fraudulent financial reporting as its study isolated firms that were charged for rue violation for the purpose of its analysis. Reliance on the extreme ends of named firms has been criticized in the measure of audit quality as several factors capable of reducing audit quality exist between the two extremes (Krishnan, 1994). Studies with positive outcome of audit quality being precipitated by audit industry specialization also include Chi and Chin (2011) and Gracia-Blodeon and Argiles-Bosch (2017). While Chi and Chin (2011) tried to distinguish between firm specialist and partner specialist with respect to audit quality, thus obviating the direct effect of specialist auditor and also adopted the use of modified audit opinion despite its rareness, Gracia-Blodeon and Argiles-Bosch (2017) limited their study to specialist partners thus being unable to explain how the audit firm specialization could modify audit quality. As observed in the reviewed previous studies, accounting research has rarely considered observing audit quality from both the supply and demand ends by entwining data from both the auditors and preparers of accounts through extraction from audited financial statements across different industries. This is required in order to understand the realities of audit quality amid the dynamics of audit industry specialization through the triangulation of evidence across different data sets. Hence, the proposition that auditor industry specialization does not significantly impact audit quality of listed non-financial firms in Nigeria.

3. METHODOLOGY

3.1 Design, Sample and Data

This study adopts a longitudinal research design. Data were collected from 14 years (2005-2018) audited financial statements of companies listed on the Nigerian Exchange Group (NEG). The sample period was considered appropriate as it represents the period during which the entire accounting architecture underwent a major reform in response to the World Bank's Observance of Standards and Codes which took place in 2004 and 2011 respectively. Although, the study population comprises of all companies listed in Nigeria comprising 166 at 2018 year end. There are 11 sub sectors therefrom (NEG, 2019). Study data were extracted from annual financial reports of the companies excluding firms with incomplete data. The annual reports were retrieved from the website of African Financials and those of reporting entities.

Table 1: Population and Sample Selection

Study Population: Stock Exchange Listed companies in Nigeria – 31/12/2018		166
Excluded Companies:		
Companies with less than 5 years financial statement before 2011	73	
Financial firms	53	(126)
Samples adopted in the study		40
Number of years	**14**	
Firm-Year observation over 14 years less missing data:		517

Industry breakdown of selected samples

Sectors	Population of firms	Samples drawn	Percentage of population	Freq of observation	Percent Firm
Agri	**05**	**2**	40.0%	26	5.0%
Conglomerates	**06**	3	50.0%	41	7.9%
Construction and Real Estate	**09**	3	33.3%	39	7.5%
Consumer Good	**20**	12	60.0%	154	29.8%
Healthcare services	**10**	4	40.0%	52	10.1%
ICT	**09**	1	11.1%	12	2.3%
Industrial Good	**13**	1	7.7%	14	2.7%
Natural Resource	**04**	2	50.0%	25	4.8%
Oil and Gas	**12**	6	50.0%	75	14.5%
Services	**25**	6	24.0%	79	15.3%
Total	**113**	**40**	35.4%	517	100

Source: Authors' Computation, (2021)

The overall sample selected represents 35.4% of the entire sample frame. The sample selection criteria were chosen to ensure that all sectors are, at least represented in the sample selection. Various sectorial representation as shown in Table 1 reveals that both ICT and Industrial Goods sectors account for the least representation in sample selection while consumer goods account for the highest sample selection in all, as consumer goods sector account for the highest sample representation among the non-financial firms sub-sector. The final sample include 40 listed companies covering a period of 14 years and results in 517 observations less missing data

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3.2 Model of Operational Relationship among Variables

Audit quality = *f*(Auditor industry specialization). (1)

$AQ = \alpha_0 + \alpha_1 ais_{it} + \alpha_2 Ctrls_{it} + \varepsilon$ (2)

AQ = Audit quality measured as the outcome of equations (3 & 4).

3.3 Audit Quality Measures

Two (2) models of audit quality were estimated to derive audit quality proxies as follows:

3.3.1 Kothari et al (2005) – Modified Jones Model (1991)

$TA_{it} = \boldsymbol{\alpha_0} + \boldsymbol{\alpha_1}(1/ASSETS_{it-1}) + \boldsymbol{\alpha_2}(\Delta SALES_{it} - \boldsymbol{\alpha_2}\Delta AR_{it)} + \boldsymbol{\alpha_3} PPE_{it} + \varepsilon_{it}$ (3)

In the above equation,

TA = change in non-cash current assets minus change in current liabilities excluding current portion of non-current debt, amortization and depreciation, divided by lagged total assets.

ΔSALES = Change in sales divided by lagged total assets

ASSETS = Total Assets

ΔAR = Change in account receivable

PPE = net property, plant and equipment divided by lagged total assets.

ROA = Return on assets, measured as the ratio of the firm's earnings divided by total assets.

The residual scores derived from the regression model in (eq. 3) were used as discretionary accruals estimating a pooled OLS approach (McNichols & Stubben, 2018) to provide a proxy for assessing the degree of biasness embedded within the financial statement by the management and afforded by the auditors and hence audit quality measure.

3.3.2 Performance Adjusted Jones (1991) Model as modified by Kothari et al (2005)

$$TA_{it} = \alpha_0 + \alpha_1(1/ASSETS_{it-1}) + \alpha_2 (\Delta SALES_{it} - \Delta AR_{it}) + \alpha_3 PPE_{it} + \alpha_4 ROA_{it} + \varepsilon_{it} \quad (4)$$

The residuals from the regression models 3 & 4 were used as discretionary accruals and measures of audit quality. Auditor Industry Specialization of auditor is measured by a product of portfolio share of auditor and market share of auditor. The market share of auditor is the revenue of the clients within the industry divided by the total sales in the industry. Portfolio share of auditors' general client sales divided by auditors' general firm-wide client sales. In order to account for the firm specific and auditor-specific factors of specialization of auditors, a product of the two measures was adopted (Fleming et al. 2014; Neal & Riley, 2004).

Table 2. Control Variables

s/n	Variable	Abbreviation	Definition/ Measurement	Source
I	Audit Fee Premium	af	Residual of equation 5 model	Hope, Tony, Thomas and Young (2009)
ii	Audit firm Size	az	Binary variable 1 represents Big 4, and 0 otherwise	Zhu and Sun (2012)
iii	Market Capitalization of the firm	mcpt	The market capitalization of listed companies, scaled by average total assets.	Ball, Tyler and Wells (2015)
iv	Leverage of the firm	lev	firm's total long-term debt divided by market value of equity	Ball, Tyler and Wells (2015)
V	Return on Asset	roa	firm's earnings divided by total assets.	Ball, Tyler and Wells (2015)
vi	Loss	loss	Score one (1) if earnings after tax (EAT) divided by lagged total assets (t − 1) for firm i in year t is negative and the absolute value of change in EAT divided by lagged total assets during year t is greater than 10%, otherwise zero.	Jiang, Habib and Zhou (2015) Ball, Tyler and Wells (2015)
vi	Firm Size	fsz	Natural log of total assets	Alhababsah, (2019); Jiang, Habib and Zhou (2015)
vii	Price/Earnings ratio	pe	Price per dhare divided by earnings per share for firm i in year t.	Jiang, Habib and Zhou (2015)

viii	Asset turnover	ato	total sales scaled by total assets.	Jiang, Habib and Zhou (2015)
ix	Lagged Total Accrual	tact1	Total accrual in year t-1 scaled by t-2 total assets	Singh, Singh, Sultana and Evans (2019)
x	Lagged loss	lloss	Lagged loss	Singh, Singh, Sultana and Evans (2019)
xi	Sales growth	sgr	Sales growth of client firm i at the end of time period t	Singh, Singh, Sultana and Evans (2019)

Source: Author's Synthesis (2021).

3.3.3 Audit Fee Model

Audit fee model, stated by Hope, Tony, Thomas and Young (2009) and Corbella, Florio, Gotti and Mastrolia (2015) on Audit Fee Premiums was estimated to determine its residual as audit fee premium proxy for this study. Audit fee premium was calculated as the difference between actual audit fees and predicted audit fee. The model is stated thus:

$totfee_{it} = \boldsymbol{\alpha}_0 + \boldsymbol{\alpha}_1 BIG_{it} + \boldsymbol{\alpha}_2 SIZE_{it} + \boldsymbol{\alpha}_3 LOSS_{it} + \boldsymbol{\alpha}_4 LEV_{it} + \boldsymbol{\alpha}_3 ROA_{it}$ + Year Fixed Effects + ε (5)

where totfee = total audit fee scaled by total sales.

BIG = variable equal to 1 if the audit firm is one of the Big 4 audit firms or 0 otherwise.

SIZE = natural log of net sales

LOSS = binary variable equal to 1 if the company experienced a loss in the period, and 0 otherwise.

LEV = the difference between total liabilities and stockholders' equity scaled by total assets

ROA = Return on assets, measured as the ratio of the firm's earnings divided by total assets.

3.4. Model Estimation Technique

The specified specified were estimated using Panel Corrected Standard Errors (PCSE) as well as Pooled Ordinary Least Square Methods. The choice of either depends on the results of preliminary analysis such as Hausman test, Heteroscedasticity, Serial Correlation, as well as Breusch and Pagan Lagrangian Multiplier tests. All the models specified were estimated with the use of an appropriate technique using stataMP 14.

4. DATA ANALYSIS AND RESULT PRESENTATION

This section presents the data analysis using descriptive and inferential statistics. The descriptive analysis made use of mean and standard deviation while the inferential analysis adopts panel analysis, using Panel Corrected Standard Error (PCSE) to estimate the specified models.

Table 3: Descriptive Analysis

Variable	Obs	Mean	Std. Dev
Aq	517	0.860059	8.737503
Ais	517	0.062128	0.068419
Af	517	-9.7E-05	0.020615
Az	517	0.682785	0.465843
Mcpt	517	1.820928	6.70281
Lev	517	0.670019	2.050107
Roa	517	0.071663	0.962372
Loss	517	0.183752	0.387657
Fsz	517	9.942244	1.736434
Pe	517	-90.7576	2420.796
Ato	517	3.154275	10.72303

Source: Authors' Computation, 2021

Table 3shows that, the audit quality measures indicates a mean of 0.86 for the entire observation. This suggests an average magnitude of absolute value of discretionary accrual is 86% of the total assets of the sampled firms. The standard deviation is 8.73. On the average, the overall market capitalization (mcpt) N1.8billion. Similarly, mean values for leverage (lev), return on asset (roa), loss, firm size (fsz), price/earnings ratio (pe) as well asset turnover (ato) indicate the importance of their inclusion in the model.

4.2 Descriptive Analysis based on Audit Industry Specialization

Table 4 displays the auditor portfolio share as a proxy for auditor industry specialization as suggested by Neal and Riley (2004). It captures the portfolio of auditors across industry and isolate individual auditors share in that industry. In order not to violate the conditions for determining audit industry specialization as estimated by Neal and Riley (2004), the financial industry auditors were captured in the computation of audit industry specialization in the descriptive analysis. The table shows that Deloitte, which is a Big 4 firm, has presence in all the industries with the highest portfolio share of 39.3% in the consumer goods industry, followed by its share of 24.2% in the financial services industry, then 13.63 % in the oil and gas industry. Its least portfolio shares are recorded in the ICT and the agricultural sectors.

Table 4: Descriptive Analysis based on Audit Industry Specialization: Auditor Portfolio Share

	Big4	Agricu-lture	Conglo merates	Construction/ Real Estate	Consumer Goods	Health care	Ict	Industrial Goods	Natural Resources	Oil and Gas	Services	Finacial Services
Deloitte	Yes	0.0051	0.0077	0.0779	0.3934	0.0047	0.0005	0.0660	0.0559	0.1363	0.0104	0.2421
EY	Yes	0.0012	0.2300	0.0045	-	0.0102	-	-	-	0.4297	0.0068	0.3177
KPMG	Yes	-	0.0030	-	0.3161	-	-	0.0500	-	0.1252	0.0045	0.5012
PWC	Yes	-	0.0463	0.0050	0.1148	-	-	-	-	0.1976	-	0.6363
BDO	No	0.5683	-	-	-	-	0.2062	-	-	-	0.2256	-
SIAO	No	-	-	-	-	0.9290	-	-	-	-	0.0710	-
Horwath Dafinone	No	-	-	-	-	-	-	-	-	-	1.0000	-
PFK Professionals	No	-	-	-	-	0.0392	-	-	-	0.8233	0.0782	0.0592
HLB Z.O Olusanya& Co	No	-	-	-	-	-	-	-	-	-	1.0000	-
Ugboaja Martins & Co	No	-	-	-	-	-	-	-	-	1.0000	-	-
BalogunBadejo&Co	No	-	-	-	-	-	-	-	1.0000	-	-	-
piropoulos,Adiele, Okpara & Co.	No	1.0000	-	-	-	-	-	-	-	-	-	-
Grant Thornton Nig C A	No	1.0000	-	-	-	-	-	-	-	-	-	-
Nexia Agbo Abel & Co	No	-	-	0.6015	-	-	-	-	0.3985	-	-	-
Dele Olufon & Co Chartered Accountants	No	-	-	1.0000	-	-	-	-	-	-	-	-
OOP and Partners	No	-	-	-	1.0000	-	-	-	-	-	-	-
Marison Odede & Co.	No	-	-	-	1.0000	-	-	-	-	-	-	-
AhmedZakari & Co	No	-	-	-	-	-	-	-	-	-	-	1.0000

Source: Authors' Computation, 2021

Table 5: Descriptive Analysis based on Audit Industry Specialization: Auditor Market Share

	Agricu-Lture	Conglo Merates	Construction/ Real Estate	Consumer Goods	Health care	Ict	Industrial Goods	Natural Resources	Oil and Gas	Services	Financial Serv
Deloitte	0.4044	0.0491	0.5652	0.4574	0.3509	0.2657	0.5509	0.6162	0.1822	0.3168	0.15
EY	0.0408	0.6048	0.0133	-	0.3104	-	-	-	0.2358	0.0853	0.08
KPMG	-	0.0205	-	0.3954	-	-	0.4491	-	0.1800	0.147	0.33
PWC	-	0.3256	0.0400	0.1465	-	-	-	-	0.2898	-	0.42
BDO	0.3114	-	-	-	-	0.7343	-	-	-	0.047	-
SIAO	-	-	-	-	0.0514	-	-	-	-	0.0016	-
Horwath Dafinone	-	-	-	-	-	-	-	-	-	0.1311	-
PFK Professionals	-	-	-	-	0.2873	-	-	-	0.1082	0.2345	0.003
HLB Z.O Olusanya& Co	-	-	-	-	-	-	-	-	-	0.0366	-
Ugboaja Martins & Co	-	-	-	-	-	-	-	-	0.0041	-	-
Balogun Badejo & Co	-	-	-	-	-	-	-	0.0008	-	-	-
Spiropoulos,Adiele ,Okpara & Co.	0.1518	-	-	-	-	-	-	-	-	-	-
Grant Thornton Nig Chartered Accountants	0.0917	-	-	-	-	-	-	-	-	-	-
Nexia Agbo Abel & Co	-	-	0.3805	-	-	-	-	0.3829	-	-	-
Dele Olufon & Co Chartered Accountants	-	-	0.0011	-	-	-	-	-	-	-	-
OOP and Partners	-	-	-	0.0007	-	-	-	-	-	-	-
Marison Odede & Co.	-	-	-	0.000001	-	-	-	-	-	-	-
AhmedZakari & Co	-	-	-	-	-	-	-	-	-	-	0.022

Source: Authors' Computation, 2021

Ernst & Young (EY) follows closely with presence in seven out of the ten industries. EY's audit market portfolio does not capture the consumer goods, ICT, industrial goods and natural resources sectors. Its highest portfolios of 43% and 32% are in the oil and gas and financial services sectors, followed by a 23% portfolio in the conglomerates. KPMG has no audit share in Agriculture, Construction/Real Estate, Healthcare, ICT and Natural Resources sectors of the sampled firms. It is left with portfolio share in 6 sectors, with its highest portfolio of 50% in the financial services after which its audit portfolio commands 31.6% and 12.5% in the consumer goods and Oil and gas respectively.

The portfolio share of PWC covers on five industries namely, conglomerates, construction/real estate, consumer goods, oil and gas and the financial services. In all, it has 63% of its portfolio in the financial services, 19% in the oil and gas and 11.5% in the consumer goods. All the Big 4 firms have portfolio share in three specific industries, that is, the conglomerates, oil and gas and financial services. At least three of the Big 4 firms audit the construction/real estate, consumer goods and services industry while at least two of the Big 4 firms have interest Agriculture, Healthcare and the Industrial goods industries. This suggest that the Big 4 firms have had experience in almost all the industry and would be able to command expertise and specialization in all. It specifically identifies that, other than the Big 4 firms, no other categories of auditors may be able to possess matched expertise and specialization in the audit of conglomerates and industrial goods as no other categories of auditors have audit portfolio share in these industries.

More so, Non-Big 4 auditors may also lack the requisite specialization in the audit of most of the industries as 8 out of their the total population of fourteen Non-Big 4 auditors saved for the purpose of this analysis, audit only one industry each while the remainder audit at most 4 out of the eleven subsectors. This explains the possibility of non-big4 firm to be specialized in specific sectors against others while offering opportunities for mergers among non-big4 to enable them possess the requisite specialization and expertise to conduct period audit in a manner that will improve audit quality. Audit market share captures the differentiation across all across competing audit firms within the available industries using the proportion to a particular auditors share in the market to the entire market in a particular industry.

As shown in Table 5 Big 4 firms' shares in the audit market of the Agricultural and Healthcare services industries were captured to the tune of 44.5% and 66% by only 2 of the Big 4 firms in

each while 71%, 52% and 55% respectively were captured in the construction/real estate, consumer goods and services by only 3 out of the Big 4 firms. Also, 100%, 89% and 91% in the conglomerates, oil and gas and financial services industries for all the big4 firms. In the ICT sector however, only one firm among the big4 captures 27% of the entire audit market with the 70% remainder being audited by one of the non-big4 firms. In all, the big for has the least 27% market share in at least one of the industries and generally commands the market with the largest market share in all except the ICT.

Next to the Big 4 in the capture of audit market are BDO and PFK professionals. BDO has market shares in 3 industries with 73% in the ICT, 31% in the agriculture and 4.7% in the services industry while PFK professionals have market share spread across 4 industries of Healthcare services (29%), Oil and Gas (11%), services (23%) and financial services (0.4%). The audit market share corroborates the results shown by the portfolio shares that the Big 4 firms control the audit market with their dominating presence while at the same time providing an insight into the emerging audit firms to include BDO and PFK professional firms respectively. The other benefit provided by the audit market share approach is the possibility of having good expertise stead in some non-Big 4 audit firms than some Big 4 firms as depicted by the share of BDO in the ICT industry.

Table 6 Correlation Matrix

Pwcorr	Afee	asize	Aispec	mcpt	lev	roa	Loss	fsz	Pe	ato	sgr	tact1	cir	lloss
Afee	1.000													
Assize	-0.021	1.000												
Aispec	-0.005	-0.031	1.000											
Mcpt	-0.022	-0.119*	0.035	1.000										
Lev	0.008	-0.134*	0.042	0.011	1.000									
Roa	-0.004	-0.027	0.138*	0.540*	0.086	1.000								
Loss	0.002	-0.170*	-0.160*	0.064	0.191*	-0.148*	1.000							
Fsz	-0.018	0.4440*	0.290*	-0.439*	0.001	0.121*	-0.356*	1.000						
Pe	0.022	-0.028	0.001	-0.006	0.013	0.006	-0.098*	-0.002	1.000					
Ato	0.800*	-0.196*	-0.156*	0.252*	0.080	-0.081	0.261*	-0.391*	0.010	1.000				
Sgr	0.000	0.035	0.072	0.000	-0.016	0.005	-0.024	0.003	0.002	-0.011	1.000			
tact1	0.014	0.073	0.031	-0.005	0.010	0.004	0.015	0.046	-0.008	-0.034	-0.001	1.000		
Cir	0.001	-0.068	0.109*	0.600*	0.134*	0.965*	-0.017	0.027	0.004	-0.011	-0.004	0.006	1.000	
Lloss	0.014	-0.160*	-0.154*	0.063	0.188*	-0.080	0.420*	-0.320*	0.019	0.144*	0.090*	0.019	-0.016	1.000
	Afee	**asize**	**aispec**	**mcpt**	**Lev**	**roa**	**Loss**	**fsz**	**Pe**	**ato**	**sgr**	**tact1**	**cir**	**Lloss**
VIF	5.48	1.53	1.26	3.4	1.15	21.04	1.78	2.83	1.02	6.92	1.03	1.02	21.41	1.34
Tolerance	0.182	0.653	0.794	0.294	0.866	0.048	0.563	0.354	0.978	0.144	0.973	0.983	0.047	0.749

Source: Authors' Computation, 2021

4.3. Multi-Collinearity Test

The correlation matrix in Table 6 shows multi-collinearity levels with the use of variance inflation factor, tolerance and Pearson's correlation coefficients. The highest coefficient, ($r=0.965$, $p<0.10$) relates Return on Asset with Capital Intensity Ratio indicating a VIF of 21.41 and 21.04 respectively as well as tolerance of 0.047 and 0.048. The relationship is an indication of collinearity problem to the model as Field (2009) warns that a strong linear relationship (above 0.8 or 0.9) among the independent variables is an indication of multi-collinearity. Accordingly, Myers (1990) also opined that a value of VIF in excess of 10 could be worrisome for multi-collinearity as a tolerance (I/VIF) lower than 0.2 may also lead to serious collinearity issue as noted by Menard (1995). As a result, capital intensity ratio was deleted as a control variable.

4.4 Test of Hypothesis

This result of hypothesis testing through the estimation of research model is presented in this section. It involves the estimation of Jones and Kothari et al models, popularly known as performance adjusted Jones model. The results show the output of the model estimates, the preliminary analysis and other related and necessary tests.

Table 7: Hypothesis – H_0: Auditors industry Specialization does not significantly affect audit quality of listed non-financial firms in Nigeria.

Model – Predictors	Jones Aq	Kothari et al Aq
Aispec	-3.283*	-3.300*
	(-1.72)	(-1.74)
Mcpt	0.171	0.171
	(1.47)	(1.47)
Roa	7.762***	7.762***
	(15.80)	(15.81)
Lev	0.162***	0.162***
	(2.74)	(2.74)
Loss	2.771***	2.773***
	(9.29)	(9.30)
Fsz	-0.364	-0.364
	(-0.91)	(-0.91)
Pe	0.0000229*	0.0000230*
	(1.92)	(1.94)
Ato	-0.0496***	-0.0495***
	(-3.08)	(-3.08)
Sgr	0.0000929	0.0000965

	(1.01)	(1.05)
tact1	9.04e-24*	9.06e-24*
	(1.85)	(1.86)
Lloss	-0.519	-0.520
	(-1.46)	(-1.46)
_cons	3.719	3.719
	(0.90)	(0.90)
N	517	516
R^2	0.868	0.868
adj. R^2		
Hausman(X^2)	37.14***	37.06***
Year (F)	1.71*	1.70*
Het (x^2)	42000***	41000***
Serial corr (F)	10.190***	10.159***
Model F/Wald(X^2)	6220.57***	6225.71***
BPLM Random	-	-
Est Method	PCSE	PCSE

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Authors' Computation, 2021

The models displayed in Table 7 indicate the results of the study hypothesis. The table has panels for both discretionary accrual models as proxy for audit quality. The Hausman tests reveal x^2=37.14, p<0.01 and x^2=37.06, p<0.01 for both models. This indicates the adoption of fixed effect estimation method excluding year effect as shown by (f=1.71, p>.01 & f=1.70, P>0.01). However heteroscedastic feature of that data (x^2=42000, p<0.01 and x^2=41000, p<0.01) and serial correlation (*f*=10.190, P<0.01 & f=10.159, P<0.01) support the use of Panel Corrected Standard Error (PCSE) technique for the estimation the models.

The results of panels A and B are similar regarding to all the variables of interest. They both support the rejection of the null hypothesis (*t*=-1.72, p<0.10 & *t*=-1.74, p<0.10) thereby supporting the proposition; audit industry specialization significantly affects audit quality. The signed coefficient suggests that audit quality improves as a result of auditor industry specialization. The model parameters signal good models with the statistics indicated (*f*=6220.57, P<0.01 & *f*=6225.71, P<0.01) for both models and R^2 of 86.8% for the duo. Similarly, both models present positive significant effects of PE, loss, ROA, Lev and lagged total accruals on discretionary accruals. This also indicates that audit quality is impaired by these variables in the model whilst the coefficients and significance of asset turnover suggest improvement of audit quality for sampled firms at 1% level of significance.

4.4.1 Industry Effects

Ten industries are domiciled in the non-financial services sector with the variables of interest having varying degrees of effects and significance. However, due to collinearity issues and paucity of data, the models for ICT sector and industrial goods produced spurious results while the Models *f* statistics produced for the conglomerate, healthcare, natural resources, oil & gas and services are not significant. Nevertheless the outcome of the OLS estimated models are discussed as follows.

Table 8: Industry Effects: Firms in Non-Financial Services Industry

	Agric	Cong	Constru	Conumer	Health	ICT	Indust	Natural	Oil&gas	Service s
	Aq	aq	Aq	aq	aq	aq	Aq	Aq	Aq	Aq
Aispec	-11.20	8.685	38.37***	-7.498	0	0	0	8.151	-2.413*	38.60*
	(-1.44)	(0.81)	(3.92)	(-1.32)	(.)	(.)	(.)	(1.38)	(-1.81)	(1.94)
Afee	-44.43**	-13.86	-41.48	-21.94	-11.38*	0	-1089.8	39.67	2.009	-122.4
	(-2.57)	(-1.00)	(-1.67)	(-0.64)	(-1.72)	(.)	(.)	(0.93)	(0.39)	(-0.65)
Assize	-1.516	0	2.152***	-23.04***	-0.171	-1.650	0	0.723	-0.227**	1.966
	(-1.22)	(.)	(3.19)	(-9.62)	(-0.57)	(.)	(.)	(1.45)	(-2.64)	(0.79)
Mcpt	0.193**	-0.149	1.651***	0.228***	0.0377	4.233	-6.290	0.506	-0.00158	-1.564
	(2.62)	(-0.98)	(4.61)	(4.11)	(0.32)	(.)	(.)	(0.93)	(-0.13)	(-1.36)
Roa	0.963	-0.745	1.730	2.267**	0.310	-5.103	142.6	2.782	-0.156	-1.590
	(0.88)	(-0.90)	(1.10)	(2.49)	(0.46)	(.)	(.)	(0.45)	(-0.78)	(-0.53)
Lev	-0.351	-0.0353	0.119	1.520***	0.00594	0	23.01	0.00850	0.0113*	-0.0253
	(-0.60)	(-0.26)	(0.86)	(5.01)	(0.10)	(.)	(.)	(0.04)	(1.72)	(-0.03)
Loss	0.393	-0.0635	-0.416	2.403**	0.00642	-3.165	15.69	0.398	-0.0587	-0.953
	(1.77)	(-0.24)	(-0.77)	(2.21)	(0.04)	(.)	(.)	(0.49)	(-0.67)	(-0.38)
Fsz	0.283	-0.216	-0.200	1.307***	0.147	-1.055	10.47	-0.234	0.144***	-1.633
	(0.83)	(-0.78)	(-0.39)	(5.72)	(0.68)	(.)	(.)	(-0.93)	(2.68)	(-0.97)
Pe	0.000180	0.00793	-0.0148	0.00756	0.000699	-0.0573	1.317	0.000579	-0.0000136***	-0.00453
	(0.77)	(0.93)	(-1.57)	(1.56)	(0.42)	(.)	(.)	(0.21)	(-4.42)	(-0.18)
Ato	0.00703	-0.0191	0.0737	-0.0440	-0.0426	0.160	0.330	-0.0132	-0.00547	-0.541
	(0.07)	(-0.73)	(1.69)	(-0.71)	(-0.45)	(.)	(.)	(-0.11)	(-0.70)	(-0.84)
Sgr	0.163	-0.00783	0.0180	0.000487	-0.289**	0.0964	-0.328	-0.000279	-0.000754	-3.271**
	(1.59)	(-0.21)	(0.96)	(1.04)	(-2.68)	(.)	(.)	(-0.49)	(-0.27)	(-2.22)
tact1	-5.08e-23	-1.96e-23	4.56e-24	1.15e-22*	-1.45e-21	-2.68e-21	1.01e-21	-1.02e-23	3.50e-25	1.53e-20*
	(-0.23)	(-1.35)	(0.26)	(1.70)	(-0.50)	(.)	(.)	(-0.57)	(0.33)	(1.84)
Lloss	0.344	0.201	-0.155	-0.423	0.225*	0.0117	35.95	0.489	0.0789	-1.160
	(1.33)	(1.04)	(-0.62)	(-0.52)	(1.87)	(.)	(.)	(1.18)	(1.40)	(-0.49)
_cons	-1.187	2.595	-1.122	8.702***	-0.894	10.27	-140.2	1.652	-1.024*	17.22
	(-0.33)	(0.93)	(-0.23)	(5.15)	(-0.43)	(.)	(.)	(0.70)	(-1.91)	(1.07)
N	26	41	39	154	52	12	14	25	75	79
R^2	0.959	0.306	1.000	0.566	0.324	1.000	1.000	0.505	0.335	0.256
adj. R^2	0.871	-0.111	1.000	0.512	0.015	.	.	-0.486	0.137	0.049
Model F	10.96***	0.73	23748.***	10.43***	1.05	-	-	0.51	1.69	1.23
Est Mtd	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Authors' Computation, 2021

Consistent with the results presented in the individual models, the outcome of the estimated models (t= -2.57, p<0.05; t=-1.22, p>0.10 & t=1.44 p>0.10) in the agricultural sector shows that that abnormal audit fee significantly improve audit quality. Auditor size and auditor industry specialization also indicate possible improvement in audit quality but the results are not statistically significant and as such suggest the retention of the null hypotheses in both instances. The variables in the model accounts for 95.9% of the effects on audit quality with a significant f statistics of 10.96 at 99% confidence interval. In the conglomerates, none of the predictor variables indicate significant effects on audit quality

In the construction and real estate industry, auditor size and auditor industry specialization have positive significant effect on discretional accrual (t=3.19, p<0.01 & t=3.92 p<0.01), thereby indicating that audit quality was significantly reduced by auditor size and auditor industry specialization in the construction industry. The healthcare sector shows that abnormal audit fee significantly improves audit quality as indicated by the statistical (t =-1.72, p<0.10) significance of abnormal audit fee on the absolute value of discretionary accruals. Similar outcomes were noted for auditor size and audit industry specialization in the oil & gas industry wherein there is statistically significant negative effect (t = 2.64, p<0.05; t = 1.81, p<0.05) of auditor size and audit industry specialization on discretionary accruals. The services, ICT and industrial services industries present no statistically significant effect for all of the predictor variables on the outcome variables.

5. CONCLUSION

This study is premised on the reaction of audit quality to auditor industry specialization. Samples were drawn from non-financial listed firms on the NEG to conduct both descriptive and inferential analysis. The descriptive analysis involves mean and standard deviation values while the hypothesis was tested with the use of Panel Corrected Standard Error (PCSE) to estimate the study models. Accordingly, this study relies on previous research outputs to measure audit quality (e.g. Lennox, 2016; Singh, et al, 2019; Wang, Yuan & Wu, 2017) and audit industry specialization (Neal & Riley, 2004). The study outcome submits to the proposition that audit industry specialization affects the quality of audit of non-financial listed firms in Nigeria. While the result aligns with a section of previous studies Bergen (2013) and disagree with a section such as (Gracia-Blandon & Argiles-Bosch, (2017) on the determinants of audit quality, this study's novelty lies

in its ability to disaggregate industry effects and discovers that the construction and services industries' audit quality reduced as a result of audit industry specialization while the audit quality of the oil and gas industry improved.

The Big 4 firms, having the largest market share of 98% in the oil and gas audit market in Nigeria, possess the ability to discharge quality audit even though quality is not their monopoly. Moreover, audit quality reduced in the construction and services industry where lesser presence (39% and 25%) of the big 4 is experienced. This study is unique in its ability to provide evidence to disaggregate the sectorial disparity of the effect of auditor industry specialization on audit quality on listed non-financial firms in Nigeria.

Apparently, auditors who invested in specialization in specific industries for their firms provided quality audits as noted in our study across sampled firms. The oil and gas as well as services industries were noted to have maintained the good quality across all times. The result provides evidence to identify the ability of Big 4 firms to invest in specialized industries and provide good quality audits. More so, some non-Big4 firms too to have demonstrated capacity for industry specialization and have equal chance of grooming expertise in specific industries. Nevertheless, our study evidence has shown that low quality audit may also result from the claim of specialization by auditors. Given the findings of this study, regulatory authorities in the audit profession, particularly the Financial Reporting Council of Nigeria, are strongly advised to observe the peculiarities of industries with respect to audit requirements and outcome of each industry to further enhance policy making and improve audit quality in the country.

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