“Corporate management dilemma: the nexus between audit firm industry specialization, audit effort, and audit quality”

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CORPORATE MANAGEMENT DILEMMA: THE NEXUS BETWEEN AUDIT FIRM INDUSTRY SPECIALIZATION, AUDIT EFFORT, AND AUDIT QUALITY

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Abstract

To defend its stewardship role to business owners, management often employs audit firm industry specialists to validate the reporting system's authenticity. While auditing, these specialist auditors may expend additional effort to achieve audit quality. However, the direction of the association between audit firm industry specialization, audit effort, and audit quality is unknown. Therefore, this research analyzes the nexus between audit industry specialization, audit effort, and audit quality in Nigerian banks between 2011 and 2023. Audit firm industry specialization is proxied using a binary variable, where 1 represents an audit firm with a market share above 30 percent and 0 otherwise. Audit effort is proxied by audit report lag, defined as the cumulative number of days from the fiscal year-end to the day the auditor signs off the financial statements. Finally, audit quality is proxied by using a discretionary accrual model. The study utilized the panel vector autoregression model to examine the annual data of 11 banks. The findings in the three models indicate that in the first model, prior audit effort influences the current audit effort (coef = 0.226, $p < 0.05$), while in the second model, both previous experience of specialization (coef = 0.872, $p < 0.05$) and audit effort (coef = 0.362, $p < 0.05$) influence the current audit firm industry specialization. Finally, in the third model, audit firm industry specialization drives high audit quality (coef = 0.069, $p < 0.05$). The study concludes that corporate management appointment of specialist audit firms can result in extended audit report lag but with a positive effect on audit quality.

Keywords Nigerian banks, audit firms, audit report lag, panel vector autoregression, discretionary accruals, specialized skills

JEL Classification M42, G21, C33, N27

INTRODUCTION

Corporate management is always interested in the appointment of an audit firm and the duration and outcome of the audit engagement. This interest relates to the credence-certifying function of auditing and its validation as a corporate governance mechanism (Xiao et al., 2020). Corporate management may appoint a reputable audit firm for three reasons. The first reason is to assure the owners that their interests are safeguarded. The second reason is to demonstrate their transparent account of ownership for stakeholders' trust, approval, support, and goodwill (Haack et al., 2021). The third reason is to communicate management's capabilities and commitment to a high financial reporting process to the owners (Leventis et al., 2005). Therefore, the decision to employ a reputable audit firm designated as an auditor industry specialist (henceforth called specialist) is a sequel to the management's understanding of the technical abilities, superiority of services, and credibility of the specialist audit firm that will facilitate the timely release of audited financial statements (Duellman

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et al., 2015). A corporate management dilemma arises when management wants to get the audit done within a shorter reporting lag by imposing a schedule on the audit firm because of the informational content of the timely presentation of the firm's financial statements. However, specialist audit firms may exercise caution by expending additional effort that may prolong the auditor's signature on the financial reports. This delay may be attributable to audit risk and complexities of the auditee's operations and the specialist audit firms' attempt to safeguard their reputations and mitigate litigation risks. Furthermore, the delay may result from disagreements between the auditor and the auditee on critical audit matters, which may take time to resolve. Therefore, there seems to be a nexus between audit firm industry specialization (henceforth, called specialization), audit effort, and audit quality.

1. LITERATURE REVIEW AND HYPOTHESES

This study investigates the nexus between specialization, audit effort, and audit quality. Understanding the causal relationship between these three concepts enables corporate management to solve the legitimacy and signaling dilemma surrounding their relationship with the business owners (Khaksar et al., 2022). However, these concepts are worthy of clarification, given the different interpretations and proxies in the literature. Concerning specialization, Casterella et al. (2004) define "audit firm industry specialization" as a differentiation approach to gain and sustain competitive advantage in line with Porter's (1985) competitive strategy model. Specialization can be at the partner, office/city, national/firm, or global level (Dao & Pham, 2014; Mnif & Tahri, 2024). Specialization (also known as industry specialist auditors, auditor industry specialists, or specialist audit firms) has two broad metrics: market versus portfolio shares (Audousset-Coulier et al., 2016). The market metric is determined as the proportion of audit fees (or client sales revenue or assets) over the total audit fees (or total clients' sales or assets) in the same industry (Balsam et al., 2003; Choy et al., 2024). The portfolio metric measures audit fees an auditor earned in a given industry as a proportion of those earned across all the industries in which the auditor has been engaged (Abouelela et al., 2025; Dunn & Mayhew, 2004). Some studies (e.g., Cassell et al., 2019; Rusmin & Evans, 2017) posit that audit fees, sales revenue, total assets, or the number of clients can be the basis for calculating the specialist status. However, DeFond et al. (2000) argue that using audit fees aligns with the industrial organization theory and is preferred to other indices. An auditor industry specialist status is recognized when an audit firm achieves the largest market share or has a market share above a particular threshold, usually 30 percent or both (Dao & Pham, 2014; Hung et al., 2025).

Concerning audit effort, Busto-Contell et al. (2022) refer to audit effort as the level of resources expended on an audit and has been measured in terms of audit hour, audit report lag, and audit fee (e.g., Bustos-Contell et al., 2022). Audit hours are the cumulative hours observed on an audit client engagement; however, limited studies use audit hours as an audit effort proxy since audit hours data are unavailable in most economies (Caramanis & Lennox, 2008). Audit report lag (ARL) is the "period between a company's fiscal year-end and the audit report date" (Habib & Bhuiyan, 2011). Audit fees are remuneration received by audit firms on an audit engagement. Empirical literature favours audit report lag as a gauge of audit effort because it captures audit efforts better than audit fees. For instance, audit fees may be a 'bribe' to overlook aggressive financial reporting and may not necessarily indicate a more significant audit effort (DeFond & Zhang, 2014). Additionally, using audit fees to proxy audit efforts leads to confounding analysis because audit fees reflect information on both audit hours and price (Singh et al., 2022). Audit report lag is also preferred to audit hours because audit report lag, measured in days, is a better measure than audit hours, which may be under-reported in certain circumstances. Therefore, this study adopts audit report lag (known as audit timeliness, audit delay, or financial reporting timeliness) to measure audit efforts.

Concerning audit quality, De Angelo (1981) refers to audit quality as a multi-dimensional concept, defined as the "market-assessed joint probability that a given auditor will both detect a breach in the client's accounting system and report the breach". However, the definition has been criticised because it limits audit quality to a binary concept (Mali & Lim, 2023). DeFond and Zhang (2014) define audit quality in a way that translates audit quality from being a binary classification to a status that reflects the significance of audit effort in ensuring financial information quality and the innate characteristics of the firm. DeFond and Zhang (2014) document a series of audit quality proxies, including restatements, going concern opinion, auditor size, audit fees, earnings response coefficient, meet or beat earnings target, discretionary accruals, and timely loss recognition.

A series of empirical studies have been conducted on the different associations between specialization, audit effort, and audit quality. In the first strand, some studies focus on the association between specialization and audit efforts. Studies in this direction show that the results could be positive, negative, or insignificant when using audit report lag to measure audit efforts. A positive association could indicate (1) the occurrence of financial statement grey areas warranting resolution between the audit firm specialist and the client, which may take time to resolve, or (2) additional effort being exerted by the audit firm specialist to safeguard its reputation and lower the risk of litigation. Farumi et al. (2023) analyze the effect of specialization on audit efforts using Indonesian data between 2018 and 2020. The results show a direct association, depicting that auditor specialist firms spend longer reporting lag to complete audits. The positive association between specialization and audit effort, proxied by audit report lag, is supported by the path dependence theory, which postulates that current practices depend on the previous path, experience, and feedback (Rizzello, 2004). A negative association shows that audit industry specialists, deploying human resources with industry-specific technical knowledge, achieve audit quality in a shorter audit time. For instance, Habib and Bhuiyan (2011) investigated the association between specialization and audit report lag using 105 firms in New Zealand between 2004 and 2008. Drawing from a theoretical framework anchored on agency theory, the results show a negative association between specialization and audit report lag, indicating that industry specialist auditors complete their audit engagements in a shorter period. Dao and Pham (2014) examine, among other things, the effect of specialization on the association between audit report lag and auditor tenure using United States firms between 2008 and 2010. The results show that auditors who are industry specialists attenuate the short audit tenure's negative effect on audit report lag.

Rusmin and Evans (2017) examine the relationship between specialization and audit efforts, proxied by audit report lag on listed firms in Indonesia between 2010 and 2011. The results revealed a significantly negative association, indicating that auditindustry specialists complete audits in shorter audit reporting lags. Mnif and Cherif (2023) investigated the association between individual audit partner industry specialization and audit efforts using 193 non-financial Swedish firms between 2010 and 2019. The results show that firms with specialist audit partners also complete audit engagements in shorter periods. The relationship between specialization and audit efforts could also be insignificant. Apadore and Mohd Noor (2013) analyzed the relationship between audit firm industry specialists and audit efforts using Malaysian data between 2009 and 2010. The results show an insignificant association, indicating that the reporting lag does not influence audit firm industry specialists. Abdillah et al. (2019) assess the association between specialization and audit efforts using Indonesian data between 2014 and 2016. The results show an insignificant relationship, indicating that the reporting lag does not influence auditor industry specialists. Durand (2019) argues that specialization does not significantly affect audit report lag. Therefore, while specialization may cause a change in audit efforts, little is known about the plausibility of reversal causal effects.

In the second strand, some studies focus on the association between specialization and audit quality. These studies also show that the results could be positive, negative, or insignificant. A positive association indicates that audit firm specialists use their industry-specific skills and expertise acquired through consistent learning and serving other clients in the same industry or investing in technology, personnel, and other job-enhancing facilities to achieve higher audit quality. Balsam et al. (2003) assess the relationship between specialization and earnings quality (an indicator of

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audit quality) using COMPUSTAT data for nine years The results show a positive association, suggesting that specialist audit firms achieve higher audit quality. Alareeni (2019) uses a meta-analysis to investigate, among other objectives, the association between specialization and audit quality. The findings support a positive association between specialization and audit quality.

A negative association denotes that specialist audit firms can also conduct poor audits in certain circumstances. Lim and Tan (2010) examine how specialization moderates the relationship between non-audit service fees and audit quality. The findings indicate a negative association between specialization and audit quality. Cassell et al. (2019) assess the relationship between specialization and audit quality during the financial crisis using US banking data for six years. The results show that specialist auditors' work can result in poor audit quality during the crisis. According to Beck and Wu (2006), the negative association may be attributed to the decline in incremental learning over time by the audit firm.

The association may also be insignificant. For example, Minutti-Meza (2013) assesses the relationship between specialization and audit quality using United States firms between 2000 and 2008. The results show an insignificant association. Eshleman and Guo (2020), using the United States of America data for 13 years, also found an insignificant association between seasoned auditor industry specialization and audit quality. Thus, there is empirical evidence that specialization can influence audit quality, while the opposite has not been tested.

In the third strand, some studies focus on the association between audit effort and audit quality. These studies also show that the results could be positive or negative. A positive association shows an extended auditor-client negotiation to settle grey areas discovered during an audit. Lambert et al. (2011) examine the mandatory reduction in audit reporting lag through accelerated 10-K filing deadlines on the quality of financial reports in the United States for four years. The results show that mandatory reductions in audit reporting lag are associated with lower audit quality. Salterio (2012) argues that the positive relationship between audit effort and audit quality can be traceable to prolonged auditor-auditee negotiations on critical audit matters that may affect audit quality. Furthermore, Bryant-Kutcher et al. (2013) investigate the effect of mandatory and accelerated audited financial statements filing deadlines on financial reporting quality using the United States of America regulatory 10-K filing. The results show that the mandatory accelerated filing deadlines impair financial reporting quality, implying that high audit quality positively correlates with longer reporting lag. Asthana (2014) argues that an audit firm has an acceptable threshold for determining audit quality. The firm may expend additional effort and time to achieve the desired quality threshold before signing the financial report. Xiao et al. (2020) examined the relationship between audit efforts and audit quality using listed firms in China for six years. The results show that audit effort positively correlates with audit quality, indicating that increased audit effort leads to high audit quality.

A negative association could suggest that an audit firm with expertise, knowledge, and skills can quickly achieve audit quality. Ahmed and Che-Ahmad (2016) investigated the effect of audit quality on audit efforts using Nigerian data for five years. The results show that audit quality negatively correlates with audit reporting lag, indicating that auditors perform quality audits in shorter reporting lag. Wiyantoro and Usman (2018) investigate the relationship between audit effort and quality. The results show a negative association, indicating that audit quality can be achieved with less effort by auditor industry specialists. Blanco et al. (2021) investigate the relationship between audit effort and audit quality using United States data between 2004 and 2015. The results show a negative association, indicating that audit firms expend additional effort when financial statements have lower readability, a proxy for higher audit risk and internal control deficiencies leading to low audit quality.

In summary, the empirical studies find an association between specialization and audit effort and between specialization and audit quality, respectively. However, studies investigating the relationship between specialization, audit effort, and audit quality are scant. Therefore, this study investigates the causal relationship between specialization, audit effort, and audit quality in the Nigerian banking sector between 2011 and 2023. Two reasons account for this study's selection of the Nigerian banking industry. First, the industry is a well-regulated and specialized industry that requires specialized knowledge, which is assumed to reside with the four international audit firms (Big 4) designated as auditor industry specialists with skills, knowledge, and expertise. Coincidentally, the Nigerian banking sector is fully engaged by these Big 4 firms who pride themselves as industry specialists. Second, the Nigerian banking sector stakeholders have alleged that the financial distress witnessed in the Nigerian banking industry was partly caused by the poor audit conducted by the four international audit firms (known as the Big4).

Therefore, the following hypotheses in the null form are assumed:

H1: Audit quality cannot influence audit effort.

H1: Specialization cannot influence audit effort.

H3: Prior audit effort cannot influence current audit effort.

H4: Audit quality cannot influence specialization.

H5: Audit effort cannot influence specialization.

H6: Prior experience of specialization cannot influence the current experience of specialization.

H7: Specialization cannot influence audit quality.

H8: Audit effort cannot influence audit quality.

H9: Prior audit quality cannot influence current audit quality.

2. METHODOLOGY

This study is focused on Nigerian deposit money banks because the banking sector is one of the most regulated industries in Nigeria, given its importance to the country's economic growth and development. The banking industry, through its savings, deposit mobilization, and investment, enhances capital accumulation, which contributes significantly to the country's development. Nigerian commercial banks are addressed as deposit money banks to provide clarity on the traditional functions of a commercial banking system that are distinct from other financial institutions such as merchant banks and microfinance banks. There are 23 deposit money banks in Nigeria. On the one hand, nine banks are privately listed on the Nigerian Exchange Group (NGX), and their financial statements are not available for analysis. Therefore, these banks are excluded from this study. On the other hand, 14 banks are publicly quoted and are considered for this study. However, three banks were expunged from the sample because one of the banks expressed its financial statement in a currency other than the Nigerian currency (Naira). In comparison, the two other banks had incomplete financial statements. Following the works of Ayoola et al. (2023), the study adopts annual panel data from 11 Nigerian deposit money banks between 2011 and 2023 based on the availability of financial data. The 11 banks own more than 60 per cent of the total shares of the Nigerian banking industry; therefore, their activities can be generalized as representing the banking industry.

In achieving the objective of the study, the panel VAR methodology of Abrigo and Love (2016) is adopted to examine the causal relationship between specialization, audit effort, and audit quality. The model is stated as follows:

$$Y_{it} = \sum_{J=1}^{p} A_J Y_{it-j} + U_i + \varepsilon_{it} \begin{pmatrix} i = 1, \ldots, N; \\ t = 1, \ldots.., T \end{pmatrix}, \quad (1)$$

where Y_{it} represents a three-variable vector covering specialization (SPEC), audit effort (RLAG), and audit quality (QUA), i represents the cross-sectional observations, while t represents the time element. Y_{it-j} represents a j-period lag term of Y_{it}; A_J represents the parameters to be estimated. U_j represents the vectors of the dependent variable, while e_{it} represents the idiosyncratic errors. Specialization (SPEC) is measured as a binary variable, where '1' represents an audit firm with a market share, in audit fees, of 30% and '0' otherwise. Audit effort is proxied by audit report lag (RLAG), measured as the time length between company

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year-end and the auditor's report date. Audit quality (QUA) is proxied by the discretionary accruals of modified Dechow and Dichev (2002) stated in Equation (2) as follows:

$$\frac{TACC_{it}}{AS_{it-1}} = \beta_0 + \beta_1 \frac{OPCF_{it-1}}{AS_{it-1}} + \beta_2 \frac{OPCF_{it}}{AS_{it-1}} + \beta_3 \frac{OPCF_{it+1}}{AS_{it-1}} + \varepsilon_{it}, \quad (2)$$

where *TACC* means total accrual, *AS* means total firm asset, *OPCF* means operating cash flow, and ε is the error term. The residual from the model will then be multiplied by –1 to give the value for the audit quality.

The study adopts the panel vector autoregression (PVAR or panel VAR) model to examine the causal relationship among the variables. The panel VAR represents the traditional vector autoregression extension (Sims, 1980) technique designed to examine the causal relationship between two or more variables. The use of PVAR comprises three broad phases: the pre-estimation, estimation, and post-estimation phases.

The pre-estimation phase covers five steps: the analysis of the cross-sectional dependence test and other diagnostics tests such as the multicollinearity, heteroscedasticity, and serial correlation; the investigation of the variables' stationarity property (unit root tests) and cointegration; the analysis of descriptive statistics; and the determination of the optimal lag length. A cross-sectional dependence test is used to assess the relevance of the unit root tests. The unit root tests are conducted to assess the stationarity properties of the variables to avoid spurious regression. The unit root tests comprise the first- and second-generation models. The first-generation unit root tests are sensitive to cross-sectional dependence. They may not produce reliable estimates, while the second-generation unit root tests are robust to cross-sectional dependence. The cointegration test further assesses the long-run association between variables. Descriptive statistics are conducted to gain an initial understanding of the data. Finally, an optimal lag length which minimizes the moment selection criteria is adopted using the "modified Akaike information criteria (MAIC), modified Bayesian information criteria (MBIC), and the modified Hannan-Quinn information criteria (MQIC)" as recommended in the literature (e.g., Andrews & Lu, 2001).

3. RESULTS AND DISCUSSION

Table 1 shows the results of the diagnostic tests, which indicate that errors are homoscedastic (chi = 2.927, p = 0.087), multicollinearity does not exist as no variable is above the cutoff point of 5, an absence of serial correlation of order one (F=4.747, p = 0.052), and the presence of cross-sectional dependence (chi = 12.875, p = 0.000). Table 2 shows the stationarity levels of the data using the Philips-Perron (a first-generation panel unit root test) and Pesaran (2007), a second-generation panel unit root test. The results show that audit effort and audit quality are stationary at level (integrated at order zero). In contrast, specialization is stationary at the first difference (integrated at order one). However, when subjected to the first differencing, the three variables are stationary at order 1 (1). Table 3 describes the descriptive statistics and correlation matrix. Specialization has the lowest average, while audit quality has the highest average. Coincidentally, the audit firm industry is also the most volatile, while audit quality is less volatile than the other variables. The correlation matrix shows a weak direct relationship between audit quality and specialization, while audit quality is negatively related to audit report delay. Table 4 shows the optimal lag selection indices, which show that one lag order is most appropriate for the analysis; therefore, a first-order panel VAR is adopted.

The estimation phase involves applying the panel VAR model to assess the causal relationship between specialization, audit effort, and audit quality. The method applies the Generalized Method of Moments (GMM) model where the dependent variable is included as an independent variable in its lagged form, resulting in Nickell bias (Nickell, 1981). This bias is resolved through the Helmert transformation, a forward orthogonal deviation (FOD) to minimize data loss (Hayakawa, 2009).

The post-estimation phase involves four analyses: the Granger causality test (Granger, 1969), the stability function using the graph and eigenval-

Table 1. Diagnostic tests

S/N	Tests	Analytical techniques	Results
1	Multicollinearity	Variance Inflation Factor	RLAG = 1.0; SPECIALIZATION= 1.0
2	Heteroscedasticity	Breusch-Pagan test	Chi = 2.927; p = 0.087
3	Serial correlation	Wooldridge test for autocorrelation	F = 4.747, p = 0.052
4	Cross-sectional correlation	Pesaran's test of cross-sectional independence	Chi = 12.875, p = 0.000

Table 2. Panel unit root test

	Specialization	RLAG	QUA
Level			
Philip perron test	26.33	102.42***	140.18***
Pesaran test	–0.05	–4.36***	–9.44***
First difference			
Philip perron test	107.78***	260.40***	496.36***
Pesaran test	–2.68***	–8.87***	–10.13***

Table 3. Descriptive statistics and correlation matrix of the causal relationship between audit firm industry specialization, audit effort, and audit quality

	QUA	SPEC	RLAG	MEAN	SD	SKEW	MIN	MED	MAX
QUA	1.000			0.491	0.160	0.867	0.318	0.455	0.975
SPEC	0.006	1.000		–0.006	0.342	–0.091	–1.000	0.000	1.000
RLAG	–0.020	–0.053	1.000	0.487	0.189	0.898	0.124	0.425	0.960

Table 4. Lag order selection and estimation

Lag order	CD	J	J p-value	MBIC	MAIC	MQIC
1	.9937035	43.06431	.1946087	–123.7859	–28.93569	–67.35328
2	.9961998	23.90538	.6355593	–101.2323	–30.09462	–58.90782
3	.9966641	16.34171	.5687129	–67.08342	–19.65829	–38.86709
4	.7011676	5.386223	.799425	–36.32634	–12.61378	–22.21818

ue stability, the impulse-response function (IRF), and the test of the variability of a change in one variable by another variable using the forecast-error variance decomposition (FEVD). The Granger causality test "examines whether past values of each of the explanatory variables are useful in predicting the values of each of the endogenous variables, conditional on past values of the other variables." The graph and eigenvalue of the stability condition analysis assess the model's stability by converging the eigenvalues within the circle's boundaries. The IRF shows how a variable responds to a shock in another variable, while the FEVD explains the change in a variable due to a shock in another variable in percentage terms.

Table 5 displays the panel VAR's results in models one to three. In model one, audit effort is regressed on its lagged values, audit quality, and specialization. In model two, specialization is regressed on its lagged values, audit quality, and audit effort. In model three, audit quality is regressed on its lagged values, specialization, and audit effort.

The audit effort model (Model 1) results show that the current effort positively correlates with the prior effort. In other words, the prior audit's effort influences the current audit effort. This result aligns with prior studies (e.g., Beattie et al., 2011; Caramanis & Lennox, 2008; Chan et al., 2015). According to Caramanis and Lennox (2008), audit efforts may persist over time, forcing a positive correlation between the previous year's and the current year's efforts. Beattie et al. (2011) posit that where there was a prolonged audit reporting lag during the previous accounting year based on disagreement in auditor-client negotiation on critical matters such as unusual events, material misstatements, improper accounting treatment, and

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treatment of losses, the grounded theory of interaction argues that the issues surrounding prolonged audit report lag in previous audit positively impact the audit firm's substantive testing procedures in future periods. Similarly, Chan et al. (2015) argue that when an audit firm experiences protracted auditor-client negotiation on issues bothering audit risk and the complexity of the client's operations, the auditor might perform more extensive procedures and spend more time with their clients in subsequent audit assignment to protect their reputational capital. The results also show an insignificant association between audit effort and prior values of specialization. This result is consistent with the submission of Abdillah et al. (2019), who document the non-significant effect of specialization on audit effort, proxied by audit report lag. The results do not reject the first (*H1*) and the second (*H2*) hypotheses, which state that audit quality and specialization cannot influence audit effort, respectively; however, the results reject the third (*H3*) hypothesis because prior audit efforts influence current audit effort.

The results of the specialization model (Model 2) show that a one-period lag of specialization and a one-period lag of audit effort exert positive and significant effects on the current value of specialization. This result indicates that the prior knowledge and experience positively influence the current knowledge of auditor industry specialists. Furthermore, the result also implies that the length of time of an auditor industry specialist's experience in one industry provides the knowledge base for better performance. This result is consistent with prior studies (e.g., Balsam et al., 2003; Goodwin & Wu, 2014). According to Balsam et al. (2003), an audit firm's accumulated years of service as an audit specialist firm provide its staff with industry-specific skills and knowledge of clients' operations, resulting in better performance. Furthermore, other studies (e.g., Chan et al., 2015; Goodwin & Wu, 2014) submit that specialization is derived from repetitive audit engagement over time, and this knowledge will continue to influence the audit firm's performance in the future. Neal and Riley (2004) also argue that industry-specific expertise, once attained, is likely to persist into the future. The results do not reject the fourth (*H4*) hypothesis, which posits that audit quality cannot influence specialization. However, the results reject the fifth (*H5*) and the sixth (*H6*) hypotheses, which state that audit effort and prior experience of specialization cannot influence the current experience of specialization, respectively. These results support the path dependence theory, which posits that prior experience influences current practice (Arthur, 2016) and supports the correlation between past (lagged) and the current value of audit report lag. According to Sewell (1996, p. 262), path dependence connotes that "what happened at an earlier point in time will affect the possible outcomes of a series of events occurring subsequently". In the context of this study, longer audit reporting lag in the previous accounting year can persist to the next accounting year (Salterio, 2012). Similarly, the requirements of audit regulation may extend audit procedures, resulting in prolonged audit reporting lag and lock-in effect, thereby perpetuating audit report lag in subsequent events (Habib et al., 2019). The results also show that the current performance of auditor industry specialists is positively influenced by prior audit efforts (proxied by audit report lag).

The audit quality model (Model 3) results show that a one-period lag of specialization exerts a positive and significant effect on audit quality. This indicates that audit firm industry specialists with at least a year of experience in the industry produce high audit quality. While Gaver and Utke (2019) argue that it takes about two or three years of seasoning (defined as the length of service) before an auditor industry specialist can achieve audit quality, our results show that a 'seasoning' of one-year experience may be sufficient for an industry specialist firm to achieve audit quality. This position aligns with the understanding that industry specialists invest in technology, processes, and personnel to acquire industry-specific expertise and knowledge that would improve performance. Furthermore, an auditor industry specialist may have more than one client in the same industry, which will serve to increase its expertise, develop, and improve the in-depth knowledge of the auditor in the client's operations over time with a positive impact on audit quality (Reichelt & Wang, 2010). The results reject the seventh hypothesis (*H7*), which states that specialization cannot influence audit quality; however, the results do not reject the eighth (*H8*) and ninth (*H9*) hypotheses.

The Granger causality test results (Table 6) indicate a unidirectional relationship between audit quality and specialization with specialization Granger-causing audit quality (chi = 5.439, p = 0.020), but not vice versa. Additionally, the results show a unidirectional relationship between specialization and audit effort, with audit effort Granger-causing specialization (chi = 6.863, p = 0.009), but not vice versa. Table 7 and Figure 1 reveal the panel VAR's invertibility and the model's stability through converging the eigenvalues within the circle. Figure 2 shows the impulse response function, which shows that specialization positively stimulates higher audit quality. The three diagrams in the first row show the responses of audit quality, audit effort, and specialization to a standard deviation shock of audit quality. The diagram illustrates how audit effort positively correlates with audit quality, while specialization initially negates audit quality but decays to zero. The diagrams in the second row show the responses to audit effort, audit quality, and specialization to audit effort. Audit quality negatively responds to the shock of audit effort, and the response turns positive. In contrast, specialization positively responds to the shock of audit efforts. The third row shows the responses of audit quality, audit effort, and specialization to specialization. Audit quality and audit effort positively respond to a standard deviation shock in specialization. Table 8 shows the forecast-error variance decomposition. The results show that in the audit quality model, specialization explains 8.91 % while audit effort explains only 0.40%; therefore, in the long run, specialization exceeds audit effort in explaining the variation in audit quality. In the specialization model, audit quality explains 0.35% while audit effort explains 4.99%; therefore, in the long run, audit effort exceeds audit quality in explaining the variation in the specialization. Finally, in the audit effort model, audit quality explains 0.50%, while specialization explains 0.24%; therefore, in the long run, audit quality slightly exceeds specialization in explaining the variation in audit effort.

Table 5. Baseline panel VAR model

Variables	RLAG	SPEC	QUA
	Model 1	Model 2	Model 3
QUA (–1)	0.049	–0.249	0.071
	(0.41)	(–0.68)	(0.61)
SPEC (–1)	0.011	0.872***	0.069**
	(0.32)	(9.84)	(2.33)
RLAG (–1)	0.226**	0.362***	–0.005
	(1.99)	(2.62)	(–0.09)

Note: Z-statistics are in brackets; *** p < 0.01, ** p < 0.05, * p < 0.10.

Table 6. Granger causality test

Equation	Excluded	chi2	Df	Prob > chi2
QUA	SPEC	5.439	1	0.020
	RLAG	0.008	1	0.930
	ALL	7.606	2	0.022
SPEC	QUA	0.456	1	0.499
	RLAG	6.863	1	0.009
	ALL	10.357	2	0.006
RLAG	QUA	0.171	1	0.679
	SPEC	0.101	1	0.751
	ALL	0.210	2	0.900

H0: *The excluded variable does not have a Granger-cause equation variable.*

H1: *Excluded variable Granger-causes equation variable.*

Table 7. Stability condition analysis

Eigenvalue		
Real	Imaginary	Modulus
0.8589341	0	0.8589341
0.1983509	0	0.1983509
0.1120661	0	0.1120661

The study also performed two robustness tests to validate the baseline results. The first one is the reordering of the variables in the reverse order. The results align with that of the baseline results. The second robustness test uses a simultaneous equation to analyze the data. The relationship between specialization, audit effort, and audit quality is estimated as follows:

$$SPEC = \beta_1 SPEC_{it-1} + \beta_2 RLAG + \beta_3 QUA + \varepsilon_{it}. \tag{3}$$

$$RLAG = \beta_1 RLAG_{it-1} + \beta_2 SPEC + \beta_3 QUA + \varepsilon_{it}. \tag{4}$$

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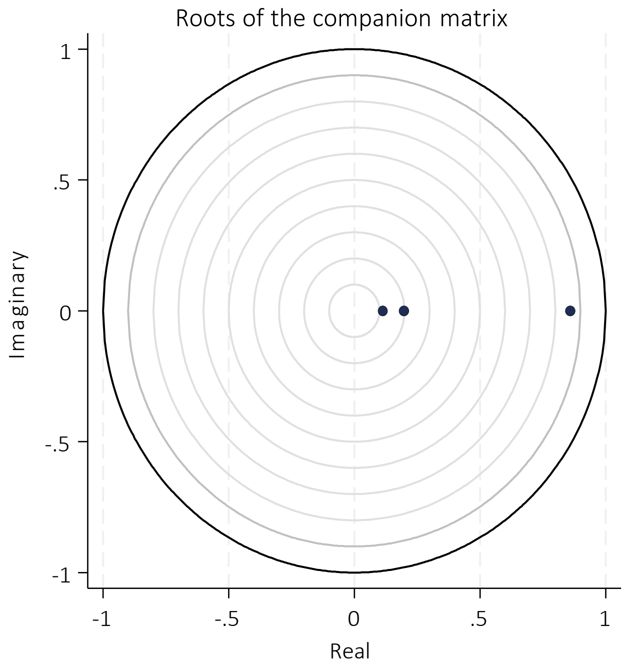

Figure 1. Graph of stability condition

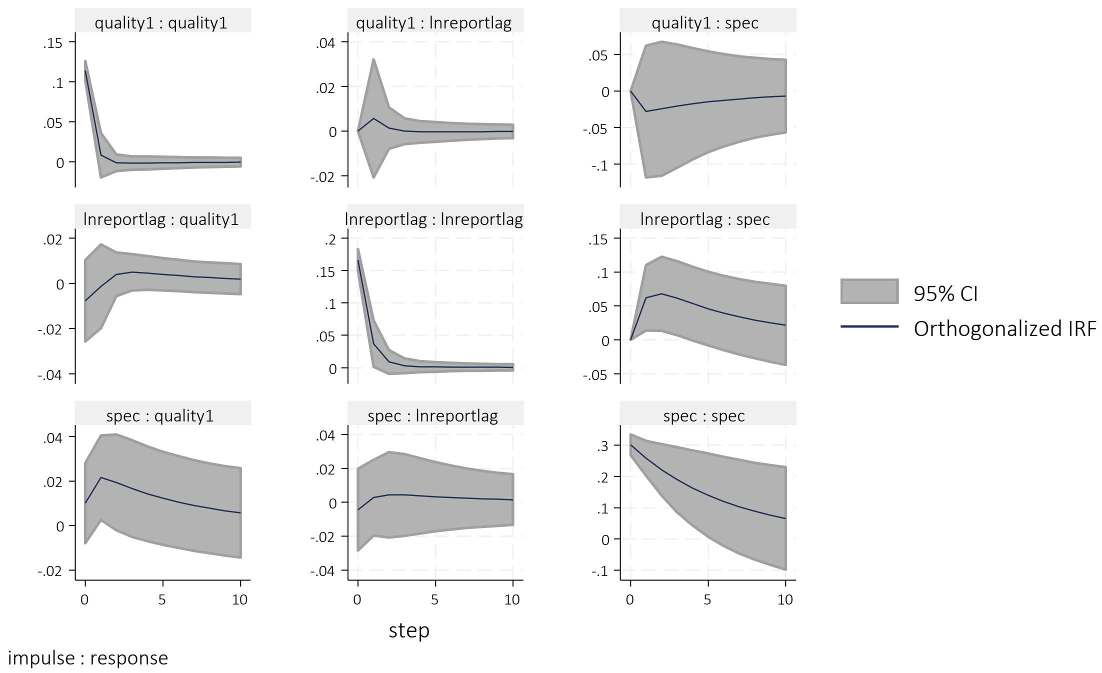

Figure 2. Impulse response function

$$QUA = \beta_1 QUA_{it-1} + \beta_2 SPEC + \beta_3 RLAG + \varepsilon_{it}. \quad (5)$$

The three-stage least squares method is used to estimate Equations 3-5 (Zellner & Theil, 1962). The results (Table 9) suggest that in the specialization (SPEC) equation, the coefficient on audit effort (RLAG) is positive and significant (t = 0.364, p = 0.044), indicating that audit specialists expend additional time to preserve their reputational capital. The results also indicate that the coefficient on

Table 8. Forecast-error variance decomposition

Response variable and forecast horizon	QUA	SPEC	RLAG
QUA			
0	0	0	0
1	1	0	0
2	0.9683276	0.0316201	0.0000523
3	0.9411191	0.0577478	0.0011331
4	0.9211484	0.0761349	0.0027168
5	0.9068037	0.0891485	0.0040477
SPEC			
0	0	0	0
1	0.0077233	0.9922767	0
2	0.0048813	0.9729392	0.0221794
3	0.0040875	0.9590884	0.036824
4	0.0036956	0.9512305	0.0450739
5	0.0034708	0.9466193	0.0499099
RLAG			
0	0	0	0
1	0.0049031	0.0004234	0.9946736
2	0.0050426	0.0006084	0.994349
3	0.0050698	0.0012632	0.9936671
4	0.0050658	0.0019091	0.9930251
5	0.005063	0.0024194	0.9925176

Table 9. Results of the simultaneous equation model

Variables	RLAG	SPEC	QUA
QUA	−0.073	0.579***	
	(−0.81)	(2.60)	
SPEC	0.058**		0.060**
	(2.01)		(2.60)
RLAG		0.364**	−0.048
		(2.01)	(−0.81)
Cons	0.503***	−0.117	0.498***
	(10.76)	(−0.80)	(15.99)

Note: Z-statistics in parentheses; *** p < 0.01, ** p < 0.05, * p < 0.10.

audit quality (QUA) is positive and significant (t = 0.579, p = 0.009), indicating that specialist auditors achieve high audit quality. In the audit effort (RLAG) equation, the coefficient on specialization (SPEC) is positive and significant (0.058, p = 0.044), indicating that specialist auditors spend more time in an audit engagement.

CONCLUSION AND POLICY IMPLICATION

This study examines the causal relationship between specialization, audit effort, and audit quality in the Nigerian banking sector between 2011 and 2023. To achieve this objective, this study applies panel VAR. The results indicate that at the 5 per cent significance level, an audit firm industry specialist with at least one year of experience achieves high audit quality; the results of an auditor industry specialist are enhanced by past performance and effort in the same industry; and finally, audit effort of the current year is influenced by the effort expended on audit in the previous accounting year. The practical implication of these findings is related to management and regulators. Management should be aware of and comply with all regulations underlying the preparation of financial statements to reduce the causes

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of prolonged audit reporting lag, which negatively affects the image and value of their firms. Regulators should continuously liaise with corporate management to avoid regulations that can disrupt the continuous learning process of auditor industry specialists. Management's employment of an auditor industry specialist enhances the firm's accountability and adherence to sustainable financial reporting practices and regulations, contributing to efficient, responsible production (SDG 12), more robust, reliable, and effective institutions (SDG 16), as well as building trust among key stakeholders (shareholders, management, and creditors) for a collaborative partnership in achieving the lofty developmental goals (SDG 17). The study is limited to the single measurements adopted for audit quality, specialization and audit efforts; future studies can explore alternative measurements of these variables. This study uses the Nigerian banking sector, and the results may not apply to other economies with different institutional, economic, and financial systems.

AUTHOR CONTRIBUTIONS

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Writing – reviewing & editing: Tajudeen John Ayoola, Eghosa Godwin Inneh, Lawrence Ogechukwu Obokoh.

REFERENCES

1. Abdillah, M. R., Mardijuwono, A. W., & Habiburrochman, H. (2019). The effect of company characteristics and auditor characteristics on audit report lag. *Asian Journal of Accounting Research, 4*(1), 129-144. https://doi.org/10.1108/AJAR-05-2019-0042
2. Abouelela, O., Diab, A., & Saleh, S. (2025). The determinants of the relationship between auditor tenure and audit report lag: evidence from an emerging market. *Cogent Business & Management, 12*(1), 2444553. https://doi.org/10.1080/23311975.2024.2444553.
3. Abrigo, M. R. M., & Love, I. (2016). Estimation of panel vector autoregression in Stata. *Stata Journal, 16*(3), 778-804. https://doi.org/10.1177/1536867x1601600314
4. Ahmed, M. I., & Che-Ahmad, A. (2016). Effects of board size, board committees characteristics and audit quality on audit report lags. In *ISSC 2016: International Soft Science Conference* (pp. 810-818). http://dx.doi.org/10.15405/epsbs.2016.08.114
5. Alareeni, B. A. (2019). The associations between audit firm attributes and audit quality-specific indicators: A meta-analysis. *Managerial Auditing Journal, 34*(1), 6-43. https://doi.org/10.1108/MAJ-05-2017-1559
6. Andrews, D. W. K., & Lu, B. (2001). Consistent model and moment selection procedures for GMM estimation with application to dynamic panel data models. *Journal of Econometrics, 101*(1), 123-164. https://doi.org/10.1016/S0304-4076(00)00077-4
7. Apadore, K., & Mohd Noor, M. (2013). Determinants of audit report lag and corporate governance in Malaysia. *International Journal of Business and Management, 8*(15). https://doi.org/10.5539/ijbm.v8n15p151
8. Arthur, W. (2016). *Increasing Returns and Path Dependence in the Economy. Increasing Returns and Path Dependence in the Economy*. University of Michigan Press. https://doi.org/10.3998/mpub.10029
9. Asthana, S. (2014). Abnormal audit delays, earnings quality and firm value in the USA. *Journal of Financial Reporting and Accounting, 12*(1), 21-44. https://doi.org/10.1108/jfra-09-2011-0009
10. Audousset-Coulier, S., Jeny, A., & Jiang, L. (2016). The validity of auditor industry specialization measures. *Auditing, 35*(1), 139-161. https://doi.org/10.2308/ajpt-51176.

11. Ayoola, T. J., Olasanmi, O. O., Inneh, E. G., Ayoola, A. O., & Ehiobuche, C. (2023). Corporate governance quality, corporate life cycle and investor confidence in commercial banks: Evidence from Nigeria. *Banks and Bank Systems, 18*(3), 136-146. https://doi.org/10.21511/BBS.18(3).2023.12

12. Balsam, S., Krishnan, J., & Yang, J. S. (2003). Auditor industry specialization and earnings quality. *Auditing, 22*(2), 71-97. https://doi.org/10.2308/aud.2003.22.2.71

13. Beattie, V., Brandt, R., & Fearnley, S. (2001). *Behind Closed Doors: What Company Audit is Really About*. Palgrave Macmillan, London. https://doi.org/10.1057/9780230599413

14. Beck, P. J., & Wu, M. G. H. (2006). Learning by Doing and Audit Quality*. *Contemporary Accounting Research, 23*(1), 1-30. https://doi.org/10.1506/axu4-q7q9-3yab-4qe0

15. Blanco, B., Coram, P., Dhole, S., & Kent, P. (2021). How do auditors respond to low annual report readability? *Journal of Accounting and Public Policy, 40*(3). https://doi.org/10.1016/j.jaccpubpol.2020.106769

16. Bryant-Kutcher, L., Peng, E. Y., & Weber, D. P. (2013). Regulating the timing of disclosure: Insights from the acceleration of 10-K filing deadlines. *Journal of Accounting and Public Policy, 32*(6), 475-494. https://doi.org/10.1016/j.jaccpubpol.2013.08.003

17. Bustos-Contell, E., Porcuna-Enguix, L., Serrano-Madrid, J., & Labatut-Serer, G. (2022). Female audit team leaders and audit effort. *Journal of Business Research, 140,* 324-331. https://doi.org/10.1016/j.jbusres.2021.11.003

18. Caramanis, C., & Lennox, C. (2008). Audit effort and earnings management. *Journal of Accounting and Economics, 45*(1), 116-138. https://doi.org/10.1016/j.jacceco.2007.05.002

19. Cassell, C., Hunt, E., Narayanamoorthy, G., & Rowe, S. P. (2019). A hidden risk of auditor industry specialization: evidence from the financial crisis. *Review of Accounting Studies, 24*(3), 891-926. https://doi.org/10.1007/s11142-019-09508-w

20. Casterella, J. R., Francis, J. R., Lewis, B. L., & Walker, P. L. (2004). Auditor industry specialization, client bargaining power, and audit pricing. *Auditing, 23*(1), 123-140. https://doi.org/10.2308/aud.2004.23.1.123

21. Chan, K. H., Luo, V. W., & Mo, P. L. L. (2015). Determinants and implications of long audit reporting lag Evidence from China. *Accounting and Business Research, 46*(2), 145-166. https://doi.org/10.1080/00014788.2015.1039475

22. Choy, H., Lin, J. J., & Yeh, Y. H. (2024). Layers of Auditor Industry Specialization: Evidence from Client Firms' Investment Efficiency. *Journal of International Accounting Research, 24*(2), 1-22. https://doi.org/org/10.2308/JIAR-2023-066.

23. Dao, M., & Pham, T. (2014). Audit tenure, auditor specialization, and audit report lag. *Managerial Auditing Journal, 29*(6), 490-512. https://doi.org/10.1108/MAJ-07-2013-0906

24. De Angelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics, 3*(3), 183-199. https://doi.org/10.1016/0165-4101(81)90002-1

25. Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. In *Accounting Review* (Vol. 77, pp. 35-59). American Accounting Association. https://doi.org/10.2308/accr.2002.77.s-1.35

26. DeFond, M. L., Francis, J. R., & Wong, T. J. (2000). Auditor industry specialization and market segmentation: Evidence from Hong Kong. *Auditing, 19*(1), 49-66. https://doi.org/10.2308/aud.2000.19.1.49

27. DeFond, M., & Zhang, J. (2014). A review of archival auditing research. *Journal of Accounting and Economics, 58*(2-3), 275-326. https://doi.org/10.1016/j.jacceco.2014.09.002

28. Duellman, S., Hurwitz, H., & Sun, Y. (2015). Managerial overconfidence and audit fees. *Journal of Contemporary Accounting and Economics, 11*(2), 148-165. https://doi.org/10.1016/j.jcae.2015.05.001

29. Dunn, K. A., & Mayhew, B. W. (2004). Audit firm industry specialization and client disclosure quality. *Review of Accounting Studies, 9*(1), 35-58. https://doi.org/10.1023/B:RAST.0000013628.49401.69

30. Durand, G. (2019). The determinants of audit report lag: a meta-analysis. *Managerial Auditing Journal, 34*(1), 44-75. https://doi.org/10.1108/MAJ-06-2017-1572

31. Eshleman, J. D., & Guo, P. (2020). Do seasoned industry specialists provide higher audit quality? A re-examination. *Journal of Accounting and Public Policy, 39*(6). https://doi.org/10.1016/j.jaccpubpol.2020.106770

32. Farumi, L., Wahyudi, T., & Khamisah, N. (2023). Influence of audit committee, auditor industry specialization, and audit tenure on audit report lag. *Business Management Analysis Journal (BMAJ), 6*(1), 58-77. http://dx.doi.org/10.24176/bmaj.v6i1.8687

33. Gaver, J. J., & Utke, S. (2019). Audit Quality and Specialist Tenure. *The Accounting Review, 94*(3), 113-147. https://doi.org/10.2308/accr-52206

34. Goodwin, J., & Wu, D. (2014). Is the effect of industry expertise on audit pricing an office-level or a partner-level phenomenon? *Review of Accounting Studies, 19*(4), 1532-1578. https://doi.org/10.1007/s11142-014-9285-8

35. Granger, C. W. J. (1969). Investigating Causal Relations by Econometric Models and Cross-spectral Methods. *Econometrica, 37*(3), 424. https://doi.org/10.2307/1912791

36. Haack, P., Schilke, O., & Zucker, L. (2021). Legitimacy Revisited: Disentangling Propriety, Validity, and Consensus. *Journal of Management Studies, 58*(3), 749-781. https://doi.org/10.1111/joms.12615

http://dx.doi.org/10.21511/imfi.22(3).2025.10

37. Habib, A., & Bhuiyan, M. B. U. (2011). Audit firm industry specialization and the audit report lag. *Journal of International Accounting, Auditing and Taxation, 20*(1), 32-44. https://doi.org/10.1016/j.intaccaudtax.2010.12.004

38. Habib, A., Bhuiyan, M. B. U., Huang, H. J., & Miah, M. S. (2019). Determinants of audit report lag: A meta-analysis. *International Journal of Auditing, 23*(1), 20-44. https://doi.org/10.1111/ijau.12136

39. Hayakawa, K. (2009). First Difference or forward orthogonal deviation-which transformation should be used in dynamic panel data models? A simulation study. *Economics Bulletin, 29*(3), 2008-2017. Retrieved from https://ideas.repec.org/a/ebl/ecbull/eb-09-00361.html

40. Hung, W. J., Shu, P. G., Wang, Y. M., & Chiang, T. L. (2025). The relationship between auditing industry specialization and the relative derivatives use for earnings management: evidence from China. *International Journal of Emerging Markets, 20*(2), 863-886. https://doi.org/10.1108/IJOEM-06-2022-0947

41. Khaksar, J., Salehi, M., & Dashtbayaz, M. L. (2022). The relationship between political relations with audit quality and auditor industry expertise. *Journal of Public Affairs, 22*(S1). https://doi.org/10.1002/pa.2780

42. Lambert, T. A., Jones, K. L., & Brazel, J. F. (2011). *Unintended Consequences of Accelerated Filings: Are Mandatory Reductions in Audit Delay Associated with Reductions in Earnings Quality?* Retrieved from https://www.researchgate.net/publication/238085673_Unintended_Consequences_of_Accelerated_Filings_Do_Changes_in_Audit_Delay_Lead_to_Changes_in_Earnings_Quality

43. Leventis, S., Weetman, P., & Caramanis, C. (2005). Determinants of Audit Report Lag: Some Evidence from the Athens Stock Exchange. *International Journal of Auditing, 9*(1), 45-58. https://doi.org/10.1111/j.1099-1123.2005.00101.x

44. Lim, C. Y., & Tan, H. T. (2010). Does auditor tenure improve audit quality? Moderating effects of industry specialization and fee dependence. *Contemporary Accounting Research, 27*(3), 923-957. https://doi.org/10.1111/j.1911-3846.2010.01031.x

45. Mali, D., & Lim, H. (2023). An analysis of audit effort/hour demand based on shareholder ownership power. *Asian Review of Accounting, 31*(4), 583-611. https://doi.org/10.1108/ARA-10-2022-0248

46. Minutti-Meza, M. (2013). Does auditor industry specialization improve audit quality? *Journal of Accounting Research, 51*(4), 779-817. https://doi.org/10.1111/1475-679X.12017

47. Mnif, Y., & Cherif, I. (2023). Audit partner industry specialization and audit report lag: Do changes in the audit reporting requirements matter? *Journal of Financial Reporting and Accounting*. https://doi.org/10.1108/JFRA-10-2022-0377

48. Mnif, Y., & Tahri, M. (2024). Industry specialization and tax avoidance in the Australian banking industry. *Meditari Accountancy Research, 32*(2), 630-657. https://doi.org/10.1108/MEDAR-10-2020-1050

49. Neal, T. L., & Riley, R. R. (2004). *Auditor industry specialist research design. Auditing*. American Accounting Association. https://doi.org/10.2308/aud.2004.23.2.169

50. Nickell, S. (1981). Biases in Dynamic Models with Fixed Effects. *Econometrica, 49*(6), 1417. Retrieved from http://www.econ.uiuc.edu/~econ536/Papers/nickell81.pdf

51. Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics, 22*(2), 265-312. https://doi.org/10.1002/jae.951

52. Porter, M. E. (1985). *Competitive strategy: Creating and sustaining superior performance. Creating and Sustaining Competitive Advantage*. New York: The Free Press.

53. Reichelt, K. J., & Wang, D. (2010). National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research, 48*(3), 647-686. https://doi.org/10.1111/j.1475-679X.2009.00363.x

54. Rizzello, S. (2004). Knowledge as a Path-Dependence Process. *Journal of Bioeconomics, 6*(3), 255-274. https://doi.org/10.1007/s10818-004-2925-5

55. Rusmin, R., & Evans, J. (2017). Audit quality and audit report lag: Case of Indonesian listed companies. *Asian Review of Accounting, 25*(2), 191-210. https://doi.org/10.1108/ARA-06-2015-0062

56. Salterio, S. E. (2012). Fifteen years in the trenches: Auditor-client negotiations exposed and explored. *Accounting and Finance, 52*(SUPPL.1), 233-286. https://doi.org/10.1111/j.1467-629X.2012.00499.x

57. Sewell, W. W. H. (1996). Three Temporalities: Toward an Eventful Sociology. In *The Historic Turn in the Human Sciences* (pp. 245-280). Retrieved from https://deepblue.lib.umich.edu/handle/2027.42/51215

58. Sims, C. A. (1980). Macroeconomics and Reality. *Econometrica, 48*(1), 1. https://doi.org/10.2307/1912017

59. Singh, H., Sultana, N., Islam, A., & Singh, A. (2022). Busy auditors, financial reporting timeliness, and quality. *British Accounting Review, 54*(3). https://doi.org/10.1016/j.bar.2022.101080

60. Wiyantoro, L. S., & Usman, F. (2018). Audit tenure and quality to audit report lag in banking. *European Research Studies Journal, 21*(3), 417-428. https://doi.org/10.35808/ersj/1072

61. Xiao, T., Geng, C., & Yuan, C. (2020). How audit effort affects audit quality: An audit process and audit output perspective. *China Journal of Accounting Research, 13*(1), 109-127. https://doi.org/10.1016/j.cjar.2020.02.002

62. Zellner, A., & Theil, H. (1962). Three-Stage Least Squares: Simultaneous Estimation of Simultaneous Equations. *Econometrica, 30*(1), 54. https://doi.org/10.2307/1911287