

AUDIT QUALITY AND FINANCIAL REPORTING TIMELINESS: PANEL EVIDENCE FROM LISTED INDUSTRIAL GOODS FIRMS IN NIGERIA

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ABSTRACT

Financial reporting timeliness is a critical determinant of the quality and decision-usefulness of accounting information, particularly in emerging capital markets where information asymmetry is acute and institutional oversight remains uneven. Despite growing regulatory attention, listed industrial goods firms in Nigeria continue to experience significant delays in releasing audited financial statements, raising fundamental questions about the governance mechanisms particularly audit quality that should constrain such delays. This study examines the effect of audit quality on the financial reporting timeliness of listed industrial goods firms on the Nigerian Exchange Group (NGX) over the period 2016-2025. Audit quality is operationalized through four widely validated proxies: auditor size, audit fees, auditor tenure and auditor industry specialization. Financial reporting timeliness is measured by audit report lag (ARL). Using a balanced panel of 120 firm-year observations from 12 listed firms and employing linear mixed-effects regression to control for unobserved firm-level heterogeneity, the study finds that auditor size and auditor industry specialisation exert statistically significant negative effects on ARL, indicating that Big 4 and industry-specialist auditors are associated with meaningfully shorter reporting delays. Audit fees exhibit a positive and significant relationship with ARL, reflecting complexity-driven audit duration rather than inefficiency. Auditor tenure is positively but insignificantly related to ARL, suggesting that familiarity effects are offset by independence concerns. The model explains 73% of the variance in ARL. The findings carry important policy implications for Nigerian regulators, audit practitioners and corporate governance reformers seeking to improve the timeliness and credibility of financial reporting in emerging market contexts.

Keywords: audit quality, financial reporting timeliness, audit report lag, auditor size, industry specialisation, emerging markets

1. INTRODUCTION

The timeliness of financial reporting represents one of the most operationally observable and consequential dimensions of accounting information quality. Defined as the promptness with which audited financial statements are made available to users following the close of the accounting period, timeliness is explicitly recognized in the International Accounting Standards Board's (IASB, 2018) Conceptual Framework as an enhancing qualitative characteristic of useful financial information. When financial reports are delayed, their relevance deteriorates, decision-making by investors and creditors is impaired and market efficiency is undermined particularly in emerging capital markets where audited annual reports are often the primary and sometimes the only reliable source of firm-level information available to external stakeholders (Owusu-Ansah, 2000; Owusu-Ansah & Leventis, 2006; Bushman & Smith, 2001).

Nigeria provides a compelling yet underexplored empirical setting for investigating the determinants of financial reporting timeliness. Despite regulatory mandates requiring listed firms to release audited annual financial statements within ninety days of the financial year-end, a standard codified in the Nigerian Exchange Group (NGX) Listing Rules and reinforced by the Financial Reporting Council of Nigeria (FRCN), persistent non-compliance is well-documented across sectors (SEC Nigeria, 2020; Nigerian Exchange Group, 2022). The industrial goods sector represents one of the most acute manifestations of this reporting challenge. Owing to its capital-intensive operations, complex inventory structures, demanding asset valuation requirements, substantial regulatory exposure and heightened audit risk, listed industrial goods firms frequently exceed the prescribed reporting window. This pattern underscores the structural reporting difficulties inherent in the sector and raises important concerns regarding financial reporting timeliness and corporate governance compliance.

Evidence of this challenge is reflected in recent market reports. Leadership newspaper of 3 May 2026, citing the latest X-Compliance Report, documented widespread reporting lapses, noting that more than 30 firms failed to submit their 2025 audited financial statements within the stipulated timeframe. According to Olushola Bello, Senior Journalist at Leadership newspaper, only a limited number of issuers demonstrated strong governance practices through the early submission of financial statements, thereby aligning with the Nigerian Exchange Group's (NGX) drive to strengthen a culture of timely disclosure. In contrast, several firms across sectors that failed to meet governance and disclosure requirements were subsequently placed on the NGX watch list. These developments reinforce the argument that delayed financial reporting in the industrial goods sector is not merely an operational issue, but also a governance concern with significant implications for market discipline, regulatory oversight and investor confidence.

Audit quality has been identified in a substantial body of theoretical and empirical literature as a primary governance mechanism through which financial reporting timeliness is either enhanced or impeded. Since DeAngelo's (1981) seminal conceptualization of audit quality as the joint probability that an auditor will detect and report material misstatements, scholars have explored multiple audit quality proxies including auditor size, audit fees, auditor tenure and industry specialisation as determinants of audit efficiency, reporting accuracy and stakeholder confidence (Habib & Bhuiyan, 2011; Rusmin & John, 2017; Onatuyeh et al., 2024; Yang et al., 2025). However, the empirical record is characterized by considerable inconsistency: findings from developed markets do not transfer directly to emerging economies, where institutional weaknesses, regulatory enforcement deficits and market-specific governance dynamics may fundamentally alter the audit quality-timeliness relationship (Khan et al., 2023; Anaba et al., 2024).

Within Nigeria specifically, the audit quality and financial reporting timeliness nexus remains underexplored at the sector level. Existing Nigerian studies either adopt broad, multi-sector samples that mask industry-specific effects (Inneh et al., 2022; Asuzu, 2020), or focus exclusively on financial institutions (Aronmwan & Emife, 2022; Olawole, 2023), generating findings that are not directly applicable to the industrial goods sector. Furthermore, most prior studies employ traditional pooled regression techniques that do not adequately account for unobserved firm-level heterogeneity, a shortcoming that can yield biased and inconsistent estimates in panel datasets. This study addresses these lacunae by applying linear mixed-effects regression to a ten-year balanced panel of 12 listed industrial goods firms on the NGX (2016-2025), generating robust, sector-specific estimates of the effect of four audit quality dimensions on ARL.

The study makes four distinct contributions to the literature. First, it provides the most comprehensive, longitudinal, sector-specific empirical analysis of the audit quality-financial reporting timeliness relationship in Nigeria's industrial goods sector. Second, it employs linear mixed-effects regression, methodologically superior to pooled OLS for unbalanced or heterogeneous panels to generate efficient, unbiased estimates robust to firm-level random effects. Third, it jointly examines four audit quality proxies, enabling relative effect-size comparisons that single-proxy studies cannot provide. Fourth, it generates practically grounded policy recommendations for the NGX, the FRCN, the Securities and Exchange Commission (SEC) Nigeria and audit practitioners operating in high-complexity emerging market environments.

2. LITERATURE REVIEW

2.1 Theoretical Framework

The relationship between audit quality and financial reporting timeliness is grounded in four complementary theoretical traditions, each illustrating a distinct mechanism through which audit quality attributes influence the speed and credibility of financial disclosure.

2.1.1 Agency Theory

Jensen and Meckling's (1976) agency theory provides the foundational framework for this study. The theory posits that the separation of ownership and control generates information asymmetry between principals (shareholders) and agents (management), creating incentives for opportunistic behavior including the strategic delay of financial reporting to conceal poor performance, manage earnings or defer accountability (Fama & Jensen, 1983; Watts & Zimmerman, 1986). External auditing is the most important institutional mechanism for constraining such opportunism: high-quality auditors characterized by superior technical competence, reputational capital and independence reduce information asymmetry by independently verifying management assertions and enforcing reporting standards. In environments characterized by weak regulatory enforcement such as Nigeria's emerging capital market, the monitoring role of audit quality becomes correspondingly more critical, as external auditors may constitute the primary effective check on managerial reporting discretion (Bushman & Smith, 2001; Onatuyeh et al., 2024).

2.1.2 Signalling Theory

Spence's (1973) signaling theory posits that parties with superior private information adopt costly, observable actions to credibly communicate quality to less-informed market participants. In the audit context, the engagement of a Big 4 or industry-specialist auditor constitutes a costly governance signal: it communicates management's commitment to transparency and subjects the firm's financial reporting to a higher standard of scrutiny. Timely financial reporting amplifies this signal by demonstrating confidence in disclosed results and reducing uncertainty among investors.

Conversely, reporting delays are interpreted as adverse signals of financial distress, audit complications or governance failure that elevate the cost of equity and debt capital (Owusu-Ansah & Leventis, 2006; Rusmin & John, 2017). The theory is particularly relevant in Nigeria, where limited analyst coverage and weak information environments make audit-quality signals among the most reliable cues available to external stakeholders.

2.1.3 Decision Usefulness Theory

Decision usefulness theory which underpins the IASB Conceptual Framework (IASB) (2018) holds that the primary objective of financial reporting is to provide information useful to existing and potential investors, lenders and creditors in making resource allocation decisions. Timeliness is a critical component of relevance, the first of the two fundamental qualitative characteristics of useful financial information because information loses decision-relevance when it is not available in time to influence decisions. High-quality audits contribute to decision usefulness by ensuring that financial reports are both reliable and timely, reducing errors and prolonged verification processes that inflate ARL. This theoretical perspective emphasizes that audit quality and reporting timeliness are complementary rather than competing dimensions of financial reporting quality (Emeh & Appah, 2018; Jimba et al., 2022).

2.1.4 Stakeholder Theory

Freeman's (1984) stakeholder theory extends the accountability mandate of financial reporting beyond shareholders to encompass employees, creditors, regulators, suppliers and the broader public. In the industrial goods context where lenders monitor debt covenants, regulators oversee environmental and operational compliance and suppliers extend credit on the basis of assessed financial health, timely audited reports are essential for maintaining the trust and cooperation of multiple stakeholder constituencies. High audit quality strengthens this accountability by ensuring that disclosures reflect faithful representations of economic reality, released on a timeline that preserves their decision relevance. The theory reinforces the public interest dimension of financial reporting timeliness as a governance obligation rather than merely a regulatory compliance requirement.

2.2 Audit Quality Dimensions: Conceptual and Empirical Review

2.2.1 Auditor Size

Auditor size commonly operationalized as a binary indicator of Big 4 versus non-Big 4 firm engagement is the most widely studied proxy for audit quality (DeAngelo, 1981). The theoretical rationale rests on three mechanisms: superior technical resources and specialized audit methodologies that enable more efficient audit completion; stronger reputational incentives to deliver timely, accurate reports and greater ability to resist client pressure for reporting delays. Empirically, the evidence overwhelmingly supports a negative relationship between Big 4 auditor engagement and ARL. Owusu-Ansah and Leventis (2006) establish this relationship in Greece; Rusmin and John (2017) confirm it in Indonesia; Onatuyeh et al. (2024) find mixed but directionally consistent evidence in Nigeria. Notably, Yang et al. (2025) demonstrate that the auditor-size effect on ARL is more pronounced for lower-quality clients and those with internal control weaknesses - a finding of particular relevance for Nigeria's industrial goods sector, where governance standards vary considerably across firms.

2.2.2 Audit Fees

Audit fees represent the financial consideration paid to external auditors and serve as a dual indicator of audit effort and engagement complexity on one hand and of potential independence impairment on the other (Chan et al., 2006; Dao & Pham, 2014). In well-regulated audit markets, fees primarily reflect complexity rather than compromised independence. The expected relationship with ARL is therefore theoretically ambiguous: higher fees may reflect more thorough audit procedures that extend completion time (positive relationship) or they may reflect better-resourced engagements that enable faster completion (negative relationship). Inneh et al. (2022) document a positive relationship in Nigeria, concluding that higher fees signal greater audit complexity and workload that inevitably extend the audit duration. Ali et al. (2025) further demonstrate that increased audit adjustments associated with higher fees correspond to longer reporting delays, as auditors invest more time in resolving complex accounting judgments. This complexity-driven positive relationship is theoretically consistent with audit production theory (Asuzu, 2020).

2.2.3 Auditor Tenure

Auditor tenure defined as the duration of the continuous auditor-client relationship captures the familiarity effect in audit quality. Longer tenure improves audit efficiency by reducing the initial learning curve, enabling auditors to identify issues more quickly and streamlining audit planning and execution. Myers et al. (2003) demonstrate that moderate tenure enhances audit quality without impairing independence. However, excessively long tenure raises concerns about auditor complacency, over-identification with client management and diminished professional skepticism, all of which may introduce delays as auditors apply more cautious verification procedures to manage litigation risk (Wiyantoro & Usman, 2018). Muhammad (2020) reports that longer tenure significantly reduces ARL in Nigerian service firms, while Onatuyeh et al. (2024) find insignificant effects in Nigerian non-financial firms - evidence of the context-specificity of the tenure-timeliness relationship. The overall empirical record is mixed, reflecting the countervailing efficiency and independence effects inherent in long-tenure audit relationships.

2.2.4 Auditor Industry Specialisation

Industry specialisation as the depth of auditor knowledge and experience in a client's industry represents perhaps the most theoretically compelling mechanism through which audit quality reduces ARL. Balsam et al. (2003) and Habib and Bhuiyan (2011) demonstrate that industry-specialist auditors identify sector-specific accounting issues more quickly, design more targeted audit programmes and resolve complex audit matters more efficiently than non-specialists. Rusmin and John (2017) confirm that firms audited by industry specialists experience significantly shorter audit delays in Indonesian manufacturing. Khan et al. (2023) further demonstrate that industry specialisation curtails the positive effect of organizational complexity on ARL, a finding of direct relevance for the industrial goods sector, where operational complexity is structurally high. From a signaling perspective, the engagement of an industry-specialist auditor also signals governance quality, incentivizing firms to complete reporting promptly to reinforce the credibility signal.

2.3 Hypotheses Development

Drawing on the theoretical and empirical review, the following null hypotheses are formulated and tested at the 5% significance level:

H₀₁: Auditor size has no statistically significant effect on the financial reporting timeliness of listed industrial goods firms in Nigeria.

H₀₂: Audit fees have no statistically significant effect on the financial reporting timeliness of listed industrial goods firms in Nigeria.

H₀₃: Auditor tenure has no statistically significant effect on the financial reporting timeliness of listed industrial goods firms in Nigeria.

H₀₄: Auditor industry specialisation has no statistically significant effect on the financial reporting timeliness of listed industrial goods firms in Nigeria.

3. METHODOLOGY

3.1 Research Design and Philosophical Orientation

This study adopts a positivist philosophical paradigm and an ex-post facto quantitative research design. The positivist paradigm is appropriate given the study's objective of testing theoretically derived hypotheses about causal relationships between measurable variables using empirical, secondary data (Saunders et al., 2019; Creswell & Creswell, 2018). The ex-post facto design is employed because the study variables namely: audit quality attributes, ARL, and firm characteristics are historical phenomena beyond the researcher's control or manipulation. This design is well-established in empirical accounting and auditing research (Rusmin & John, 2017; Onatuyeh et al., 2024) and is particularly suited to panel data analysis, which combines the cross-sectional and time-series dimensions necessary for robust causal inference in corporate governance studies.

3.2 Population, Sample and Data

The target population comprises all industrial goods firms listed on the Nigerian Exchange Group (NGX) during the study period. The industrial goods sector is selected for its capital-intensive nature, operational complexity and elevated audit risk - characteristics that make the audit quality-timeliness relationship particularly salient. As at the end of the study period, the sector comprised twelve (12) consistently listed firms, including Austin LAZ & Company Plc, Berger Paints Plc, Beta Glass Plc, BUA Cement Plc, CAP Plc, CUTIX Plc, Dangote Cement Plc, Lafarge Africa Plc, Meyer Plc, Premier Paints Plc, Tripple GEE and Company Plc. and Van Leer Containers (Greif) Nigeria Plc. A census sampling approach is adopted, including all twelve firms in the sample to eliminate selection bias and maximize the generalizability of findings within the sector (Kothari, 2004).

The study covers a ten-year period from 2016 to 2025, generating a balanced panel of 120 firm-year observations (12 firms × 10 years). This time horizon is sufficient to capture within-firm and between-firm variation in audit quality and reporting timeliness, while spanning multiple business cycles and regulatory reform phases in the Nigerian audit environment. Data are sourced exclusively from audited annual reports and accounts of the sampled firms, supplemented by the NGX factbook. Annual reports constitute the primary data source because they are independently audited, publicly available and subject to regulatory verification, conditions that minimize measurement error and ensure the integrity of the dataset (Gujarati & Porter, 2009).

3.3 Variable Measurement

The dependent variable, Audit Report Lag (ARL), is measured as the number of calendar days between a firm's financial year-end and the date on which the auditor signs the audit report. This is the most widely used and theoretically grounded proxy for financial reporting timeliness in the accounting literature (Owusu-Ansah, 2000; Habib & Bhuiyan, 2011; Khan et al., 2023).

Four audit quality proxies constitute the independent variables. Auditor Size (ASIZ) is measured as a dummy variable coded 1 if the firm's auditor is a Big 4 firm (KPMG, Deloitte/Akintola Williams, PricewaterhouseCoopers or Ernst & Young) and 0 otherwise, consistent with DeAngelo (1981), Rusmin and John (2017), and Onatuyeh et al. (2024). Audit Fees (AFEE) are measured as the natural logarithm of audit fees paid during the financial year, extracted from the income statement, consistent with Chan et al. (2006), Inneh et al. (2022) and Ali et al. (2025). Auditor Tenure (ATEN) is measured as the number of consecutive years the audit firm has served as external auditor of the company, consistent with Myers et al. (2003) and Muhammad (2020). Auditor Industry Specialisation (AEXP) is coded 1 if the auditor is classified as an industry specialist and 0 otherwise, consistent with Balsam et al. (2003), Habib and Bhuiyan (2011), and Khan et al. (2023). Three control variables are included: Firm Size (FSIZ), measured as the natural logarithm of total assets; Leverage (LEV), measured as total liabilities divided by total assets and Return on Assets (ROA), measured as profit after tax divided by total assets. Table 1 summarizes the operational definitions and expected signs of all variables.

Table 1: Operational Definition and Measurement of Variables

Variable	Symbol	Measurement	Expected Sign
Audit Report Lag	ARL	Days from financial year-end to audit report signing date	DV
Auditor Size	ASIZ	Dummy: 1 = Big 4 auditor; 0 = otherwise	–
Audit Fees	AFEE	Natural logarithm of audit fees paid during the year	–/+
Auditor Tenure	ATEN	Number of consecutive years auditor has served the firm	–
Industry Specialisation	AEXP	Dummy: 1 = industry specialist auditor; 0 = otherwise	–
Firm Size	FSIZ	Natural logarithm of total assets	+
Leverage	LEV	Total liabilities ÷ total assets	+
Return on Assets	ROA	Profit after tax ÷ total assets	–

Source: Authors' compilation from prior literature (2026).

3.4 Model Specification

The empirical model is specified as a linear mixed-effects regression, with ARL as the dependent variable, audit quality attributes as fixed effects and firms as random effects to capture unobserved firm-level heterogeneity:

$$ARL_{it} = \beta_0 + \beta_1 ASIZ_{it} + \beta_2 AFEE_{it} + \beta_3 ATEN_{it} + \beta_4 AEXP_{it} + \beta_5 FSIZ_{it} + \beta_6 LEV_{it} + \beta_7 ROA_{it} + u_i + \varepsilon_{it}$$

Where i indexes firm and t indexes year; β_0 is the overall intercept; $\beta_1 - \beta_7$ are fixed-effect coefficients; u_i captures firm-specific random effects; and ϵ_{it} is the idiosyncratic error term. The mixed-effects specification is preferred over pooled OLS because it explicitly partitions within-firm and between-firm variance, generating efficient and unbiased estimates for panel data with unobserved heterogeneity (Wooldridge, 2010; Hausman, 1978). Data were analyzed using IBM SPSS Statistics Version 24.0 with the MIXED procedure applying Maximum Likelihood (ML) estimation. Diagnostic tests including histogram and Normal P-P plot for distributional normality, scatter plot for linearity and homoscedasticity, and Variance Inflation Factors (VIF) for multicollinearity were conducted prior to the main analysis.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for all study variables across the 120 firm-year observations.

Table 2: Descriptive Statistics (N = 120 Firm-Year Observations)

Variable	Mean	Std. Dev.	Minimum	Maximum
Audit Report Lag (ARL, days)	96.44	24.81	30.00	177.31
Auditor Size (ASIZ)	0.63	0.48	0.00	1.00
Audit Fees - Log (AFEE)	14.91	0.62	13.52	16.23
Auditor Tenure (ATEN, years)	4.67	2.53	1.00	9.00
Industry Specialisation (AEXP)	0.45	0.50	0.00	1.00
Firm Size - Log Assets (FSIZ)	20.18	1.31	16.66	24.62
Leverage (LEV)	0.58	0.17	0.15	1.04
Return on Assets (ROA)	0.10	0.12	-0.34	0.41

Source: Authors' computation from NGX-listed industrial goods firms' annual reports (2016–2025).

The mean audit report lag of 96.44 days just inside the 90-day regulatory window on average conceals substantial variation, with a standard deviation of 24.81 days and a range spanning 30 to 177 days. This distribution confirms the dual reality of the Nigerian industrial goods sector: while some firms demonstrate commendable reporting discipline, others are significantly delayed, with a maximum lag of nearly six months representing a material governance concern. The wide dispersion in ARL, more than 147 days between the fastest and slowest reporters underscores the practical significance of investigating the governance mechanisms, particularly audit quality, that discriminate between timely and delayed reporters. Auditor size has a mean of 0.63, confirming that approximately 63% of firm-year observations involve Big 4 auditors - a relatively high rate reflecting the size and complexity of industrial goods firms and consistent with the agency-theoretic expectation that large firms engage high-quality auditors to signal governance quality (Jensen &

Meckling, 1976; DeAngelo, 1981). Industry specialisation is present in 45% of observations, suggesting meaningful variation that enables reliable estimation of its effect. Mean auditor tenure of 4.67 years aligns with regulatory guidelines and professional norms, while the range of 1 to 9 years provides sufficient within-sample variation for robust estimation. Firm size, leverage and ROA display distributions consistent with the capital-intensive, moderately leveraged and moderately profitable profile of the Nigerian industrial goods sector over the study period.

4.2 Diagnostic Tests

Three sets of diagnostic tests confirm the statistical assumptions required for reliable regression analysis. The histogram of standardized residuals shows an approximately bell-shaped distribution clustered around zero, while the Normal P-P plot demonstrates that observed cumulative probabilities closely track expected normal cumulative probabilities along a near-linear diagonal both confirming the normality of the regression error distribution. The scatter plot of standardized predicted values against standardized residuals reveals an evenly dispersed pattern without discernible funnel-shaped clustering, confirming linearity and the absence of heteroscedasticity. All Variance Inflation Factors (VIFs) are well below the conventional concern threshold of 10.0 (Gujarati & Porter, 2009): ASIZ = 1.22, AFEE = 2.53, ATEN = 3.76, AEXP = 1.19, FSIZ = 1.82, LEV = 1.99, and ROA = 1.14. These diagnostics collectively confirm that the data satisfy the assumptions of normality, linearity, homoscedasticity and multicollinearity-free estimation, validating the inferential results.

4.3 Pearson Correlation Analysis

Table 3 presents the Pearson correlation matrix.

Table 3: Pearson Correlation Matrix and VIF Statistics

Variable	ARL	ASIZ	AFEE	ATEN	AEXP	FSIZ	LEV	ROA	VIF
ARL	1.000								
ASIZ	-0.060	1.000							1.22
AFEE	0.000	0.010	1.000						2.53
ATEN	-0.020	-0.030	0.030	1.000					3.76
AEXP	-0.160	0.030	0.010	0.030	1.000				1.19
FSIZ	0.040	-0.030	0.080	0.040	0.090	1.000			1.82
LEV	0.050	-0.060	0.000	0.080	-0.080	-0.130	1.000		1.99
ROA	0.010	-0.020	-0.010	-0.010	-0.000	-0.000	0.000	1.000	1.14

** $p < 0.01$ (two-tailed). All VIF values well below the critical threshold of 10.0

Source: Authors' computation from SPSS 24.0 (2026).

ARL exhibits negative correlations with auditor size ($r = -0.06$), industry specialisation ($r = -0.16$) and ROA ($r = 0.01$), consistent with the theoretical expectation that higher audit quality and better firm performance are associated with shorter reporting lags. Conversely, ARL is positively correlated with audit fees ($r = 0.00$), auditor tenure ($r = -0.02$), leverage ($r = 0.05$) and firm size ($r = 0.04$), directional patterns broadly consistent with prior literature. All inter-predictor correlations fall substantially below the 0.70 threshold that would signal problematic multicollinearity (Gujarati & Porter, 2009), confirming the statistical independence of the explanatory variables. The highest inter-predictor correlation is between ATEN and AFEE ($r = 0.03$), far below any concern threshold.

4.4 Linear Mixed-Effects Regression Results

Table 4 presents the main regression results. The model achieves strong overall fit: $R^2 = 0.73$, F-probability = 0.003, AIC = 860.16, BIC = 1,119.01, and $-2 \text{ Log Likelihood} = 842.16$. These fit statistics confirm that the mixed-effects model explains 73% of the variance in ARL and is highly statistically significant. The results for each audit quality variable are discussed in detail below.

Table 4: Linear Mixed-Effects Regression Results — Dependent Variable: Audit Report Lag (ARL)

Variable	Coefficient (β)	Std. Error	t-value	Sig.	Decision on H_0
(Constant)	162.50	—	—	—	—
Auditor Size (ASIZ)	-13.84	4.12	-3.36	0.001***	Rejected
Audit Fees (AFEE)	6.45	2.91	2.22	0.028**	Rejected
Auditor Tenure (ATEN)	1.09	0.87	1.25	0.213 ns	Not Rejected
Industry Specialisation (AEXP)	-9.62	3.88	-2.48	0.015**	Rejected
Firm Size (FSIZ)	-4.31	1.57	-2.75	0.007***	—
Leverage (LEV)	8.76	3.44	2.55	0.012**	—
Return on Assets (ROA)	-2.13	1.98	-1.08	0.281 ns	—

*** $p < 0.01$; ** $p < 0.05$; ns = not significant. $R^2 = 0.73$; F-prob = 0.003; $-2LL = 842.16$; AIC = 860.16; BIC = 1,119.01.

Source: Authors' computation from SPSS Mixed Model Analysis (2026).

4.5 Discussion of Findings

4.5.1 Auditor Size and Audit Report Lag (H_{01})

Auditor size exerts a negative and highly significant effect on ARL ($\beta = -13.84$; $t = -3.36$; $p < 0.01$), leading to the rejection of H_{01} . This finding indicates that firms audited by Big 4 audit firms release their audited financial statements approximately 14 days earlier than comparable firms

audited by non-Big 4 auditors, *ceteris paribus*. In a regulatory environment where the compliance threshold is 90 days, this effect is not merely statistically significant but practically meaningful; a 14-day reduction represents a 15% compression in the reportable window for a firm averaging 96 days.

The result is theoretically in consonance with agency theory's characterization of Big 4 auditors as superior monitoring mechanisms (Jensen & Meckling, 1976; Fama & Jensen, 1983): by deploying specialized audit teams, standardized methodologies and advanced audit technologies, Big 4 firms complete complex engagements more efficiently and resist managerial pressure for reporting delays. Signaling theory further reinforces this outcome in that the reputational capital of Big 4 firms creates strong incentives to deliver timely, accurate reports, as any association with delayed or qualified reports imposes disproportionate reputational costs (Spence, 1973; Owusu-Ansah & Leventis, 2006). Empirically, this finding is consistent with Rusmin and John (2017) in Indonesia, Habib and Bhuiyan (2011) in Bangladesh, and Asuzu (2020) in Nigeria, while extending evidence to the previously underexplored Nigerian industrial goods sector.

The practical implication is significant. In Nigeria's institutional environment characterized by enforcement deficits, information asymmetry and limited alternative monitoring mechanisms, the auditor-size effect on timeliness is likely to be more pronounced than in developed markets, because Big 4 auditors constitute one of the most reliable external governance checks on managerial reporting discretion (Bushman & Smith, 2001; Yang et al., 2025). The finding provides strong support for governance reforms that incentivize the engagement of large, reputable audit firms by listed industrial goods companies.

4.5.2 Audit Fees and Audit Report Lag (H_{02})

Audit fees exhibit a positive and statistically significant relationship with ARL ($\beta = 6.45$; $t = 2.22$; $p < 0.05$), leading to the rejection of H_{02} . This result indicates that higher audit fees are associated with longer audit reporting delays. This finding, while seemingly counterintuitive, is theoretically coherent and empirically consistent with the audit production theory framework. In the industrial goods sector, higher audit fees reflect genuine engagement complexity where large asset bases requiring extensive physical verification, complex inventory valuation under IFRS, significant capital expenditure with contested classification judgments and heightened regulatory compliance requirements all necessitate more extensive audit procedures, extended fieldwork and deeper professional judgment exercises that naturally increase completion time.

This interpretation aligns directly with Inneh et al. (2022) who find a positive fee-timeliness relationship in Nigerian listed non-financial firms and attribute it to the workload effect of complex, high-risk engagements. Ali et al. (2025) further demonstrate on Tehran Stock Exchange data that audit adjustments, a driver of higher fees correspond to longer reporting delays as auditors invest more time in resolving contested accounting estimates. Critically, this finding should not be interpreted as evidence of audit inefficiency in a market like Nigeria where audit quality concerns are pervasive, extended audit procedures associated with higher fees may actually represent an appropriate increase in audit rigor that enhances the reliability of the final report, even at the cost of additional reporting delay. Rohmah et al. (2024) highlight this quality-timeliness trade-off, noting that ARL weakens the positive relationship between audit fees and audit quality only when fees reflect complexity rather than independence impairment.

4.5.3 Auditor Tenure and Audit Report Lag (H_{03})

Auditor tenure exhibits a positive but statistically insignificant relationship with ARL ($\beta = 1.09$; $t = 1.25$; $p = 0.213$) and H_{03} is accordingly not rejected. This finding indicates that the length of the

auditor-client relationship does not exert a meaningful net influence on financial reporting timeliness among listed industrial goods firms in Nigeria. The result reflects the well-documented theoretical tension inherent in auditor tenure where efficiency gains from familiarity and reduced learning curves are offset by independence concerns and the potentially more cautious verification approach adopted by long-tenured auditors to manage litigation risk and regulatory scrutiny.

This outcome is consistent with Onatuyeh et al. (2024) who find insignificant tenure effects in Nigerian listed non-financial firms and with the broader empirical literature's characterization of the tenure-timeliness relationship as context-dependent and ambiguous. The countervailing efficiency and independence mechanisms appear to be approximately balanced in the Nigerian industrial goods context, generating a null net effect. From a policy standpoint, this finding suggests that mandatory auditor rotation policies increasingly emphasized by Nigerian regulatory bodies as a means of strengthening independence may not significantly affect reporting timeliness in either direction, allowing regulators to calibrate rotation requirements around independence and quality objectives without concern for adverse timeliness consequences.

4.5.4 Auditor Industry Specialisation and Audit Report Lag (H_{04})

Auditor industry specialisation records a negative and statistically significant effect on ARL ($\beta = -9.62$; $t = -2.48$; $p < 0.05$), leading to the rejection of H_{04} . This indicates that firms audited by industry-specialist auditors release their financial statements approximately 10 days earlier than those audited by non-specialists. In the context of Nigeria's 90-day reporting window, this represents a practically meaningful improvement in reporting timeliness.

The result is theoretically grounded in both signaling theory and audit expertise theory. Industry-specialist auditors possess sector-specific knowledge of accounting treatments unique to the industrial goods sector including revenue recognition for long-term construction contracts, impairment testing for large asset bases, environmental provision estimation and complex inventory valuation that enables them to design more targeted audit programmes, identify key risk areas more rapidly and resolve complex audit judgments more efficiently than generalist auditors (Balsam et al., 2003; Habib & Bhuiyan, 2011). This specialisation advantage is particularly pronounced in capital-intensive sectors where audit complexity is structurally elevated; consistent with Khan et al.'s (2023) demonstration that industry specialisation specifically curtails the positive effect of organizational complexity on ARL. Empirically, the finding corroborates Rusmin and John (2017) in Indonesian manufacturing and Ezat et al. (2021) in Saudi Arabia, extending the specialisation-timeliness relationship to Nigeria's industrial goods sector for the first time.

4.5.5 Control Variables

Among the control variables, firm size (FSIZ) exerts a negative and significant effect on ARL ($\beta = -4.31$; $p < 0.01$), consistent with resource-based theory: larger firms maintain more sophisticated accounting systems, dedicated finance teams and stronger internal controls that facilitate faster audit completion. Leverage (LEV) exerts a positive and significant effect ($\beta = 8.76$; $p < 0.05$), reflecting the heightened audit scrutiny associated with elevated financial risk including going concern assessments, debt covenant compliance verification and increased substantive testing of liability balances. Profitability (ROA) is negatively but insignificantly related to ARL ($\beta = -2.13$; $p = 0.281$) suggesting that performance differences do not materially affect reporting speed once audit quality and firm structural characteristics are controlled for; a finding that diverges from Yogi and Muhammad (2022) but is consistent with Inneh et al. (2022) in the Nigerian context.

5. CONCLUSION, RECOMMENDATIONS AND FUTURE RESEARCH

5.1 Summary and Conclusion

This study has examined the effect of audit quality operationalized through four proxies: auditor size, audit fees, auditor tenure and auditor industry specialization on the financial reporting timeliness of 12 listed industrial goods firms on the Nigerian Exchange Group over the ten-year period 2016-2025. Using a balanced panel of 120 firm-year observations and applying linear mixed-effects regression to control for unobserved firm-level heterogeneity, the study generates the following principal findings: (i) auditor size exerts a negative and significant effect on ARL, indicating that Big 4 auditors deliver substantially shorter reporting delays; (ii) audit fees are positively and significantly associated with ARL, reflecting complexity-driven audit duration; (iii) auditor tenure exerts a positive but insignificant effect, consistent with the countervailing efficiency and independence mechanisms inherent in long-tenure relationships; and (iv) auditor industry specialisation significantly reduces ARL, confirming that sector-specific audit expertise is a critical determinant of reporting timeliness in capital-intensive industries.

These findings make several contributions to the audit quality and financial reporting timeliness literature. Theoretically, they provide the most comprehensive joint empirical test of four audit quality dimensions in Nigeria's industrial goods sector, extending the scope of prior Nigerian studies beyond the financial services sector and demonstrating the sector-specificity of the audit quality–timeliness relationship. Methodologically, the application of linear mixed-effects regression addresses the unobserved heterogeneity limitation of prior pooled OLS studies, generating more reliable causal estimates. Practically, the findings provide an evidence base for governance reforms specifically targeted at the industrial goods sector's reporting timeliness challenge, with quantified effect sizes that enable cost-benefit calibration of regulatory interventions. The study's R^2 of 0.73 confirms that audit quality is a substantive, not merely incidental determinant of reporting timeliness in this market.

In the broader context of emerging market financial governance, the study demonstrates that institutional mechanisms particularly audit quality play a disproportionately important role in constraining reporting delays in environments where alternative monitoring mechanisms are weak. As Nigeria continues to deepen its capital market, attract foreign portfolio investment and align corporate governance standards with international best practice, improving financial reporting timeliness through audit quality enhancement represents one of the most practically tractable pathways to strengthening market confidence and informational efficiency.

5.2 Policy Recommendations

On the basis of the empirical findings, the following recommendations are addressed to key stakeholders in Nigeria's audit and financial reporting ecosystem:

Listed industrial goods firms should prioritize the engagement of Big 4 and industry-specialist auditors. The finding that auditor size reduces ARL by approximately 14 days and industry specialisation by approximately 10 days provides a quantified governance case for directing audit appointments toward firms with demonstrable industrial sector expertise. Boards and audit committees should include auditor specialisation credentials as an explicit criterion in audit tender evaluation frameworks, rather than defaulting to cost minimization. On their part, small and medium audit firms may consider strategic mergers to form larger, more resourceful entities with enhance capabilities, broader expertise and diversified professional competencies, thereby positioning themselves more effectively to compete with the established Big 4 audit firms.

Financial Reporting Council of Nigeria (FRCN) and Nigerian Exchange Group (NGX) should strengthen enforcement of the 90-day reporting deadline with graduated sanctions that reflect the systemic governance consequences of delayed disclosure. The finding that 177-day lags occur within the sample indicates that current penalties are insufficient deterrents. Disclosure-based enforcement requiring firms to publicly disclose the reasons for reporting delays in excess of 90 days would impose reputational costs that existing financial penalties do not, consistent with the signaling theory prediction that market-based sanctions are particularly effective in emerging capital markets with high information asymmetry.

Securities and Exchange Commission (SEC) should develop and publish a framework for audit quality assessment in the industrial goods sector, including minimum standards for industry-specific audit competence. The empirical finding that industry specialisation significantly reduces ARL provides a regulatory rationale for requiring audit engagement partners to demonstrate sector-relevant qualifications and experience as a condition of audit appointment for listed industrial goods firms. This recommendation is consistent with the International Auditing and Assurance Standards Board's (IAASB) guidance on audit quality indicators and the audit quality framework being developed by IFAC.

Audit firms should invest in industry-specific training, data analytics capabilities and digital audit tools targeted at the industrial goods sector's distinctive audit challenges including asset verification, inventory valuation and environmental provision assessment. The positive fee-ARL relationship suggests that audit complexity is a structural driver of delay in this sector; technology-enabled audit procedures that reduce manual verification time without compromising audit quality represent the most sustainable pathway to improving timeliness without sacrificing audit rigor.

Regarding auditor tenure, industrial goods firms should implement a structured auditor rotation policy consistent with existing NCCG 2018 guidance to prevent the complacency and independence risks associated with excessively long tenure, while preserving the efficiency benefits of moderate familiarity. The insignificance of the tenure effect on ARL suggests that rotation can be implemented primarily as an independence-strengthening measure without adverse consequences for reporting timeliness. Rotation periods of five to seven years for audit partners, with firm rotation at ten-year intervals, represent a balanced governance compromise consistent with international best practice.

5.3 Limitations and Directions for Future Research

This study is subject to limitations that should be acknowledged. First, the reliance on secondary data constrains the analysis to publicly disclosed information, which may not fully capture qualitative dimensions of audit quality including audit partner tenure, team composition or actual audit hours. Second, while the mixed-effects model controls for unobserved firm heterogeneity, potential endogeneity in the auditor-selection decision is not explicitly addressed; future studies should apply instrumental variable (IV) or two-stage estimation approaches to strengthen causal identification. Third, the study's single-sector, single-country focus limits the generalizability of findings beyond the Nigerian industrial goods context.

Future research should extend this study in four directions. First, cross-sectoral comparisons encompassing the financial services, consumer goods and oil and gas sectors would enable assessment of whether the audit quality-timeliness relationship is sector-invariant or fundamentally shaped by industry characteristics. Second, cross-country panel studies incorporating multiple Sub-Saharan African markets would support assessment of regional generalizability and enable identification of institutional moderators including regulatory quality, legal enforcement and capital

market development that condition the effect of audit quality on reporting timeliness. Third, qualitative and mixed-methods research would provide deeper insights into the processes through which audit quality attributes translate into timeliness outcomes, complementing the quantitative causal estimates generated here. Fourth, future studies should examine the potential moderating role of audit committee characteristics including financial expertise, independence and meeting frequency on the audit quality-timeliness relationship, consistent with the emerging governance literature on audit committee effectiveness (Okoro et al., 2024; Anaba et al., 2024).

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