



## Sustainability Disclosure and Audit Report Lag: Evidence from Listed Non-Financial Firms in Nigeria

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**Abstract.** The study investigates the relationship between sustainability disclosure and the timeliness of audited financial reporting among listed non-financial firms in Nigeria. Specifically, it examined the impact of environmental, social, economic, and governance disclosures on financial reporting quality while controlling for firm size. The study employed a robust linear regression technique to analyse the data. Pre-estimation and post-estimation tests, including heteroskedasticity, multicollinearity, and autocorrelation tests, were conducted to ensure the validity and reliability of the regression results. This study employed an *ex-post facto* research design, and the data were sourced from the annual reports of one hundred and three (103) non-financial companies listed on the Nigerian Exchange Group spanning 2012 to 2023. Audit reporting lag was used to measure the timeliness of financial reporting, and it was measured as the time frame between a company's financial year-end and the date the audit report was signed off by the independent auditor. A disclosure index was constructed through a binary content analysis of annual reports to measure the independent variable. The findings revealed that environmental disclosure and social disclosure exhibited statistically significant negative associations with financial reporting quality. In contrast, economic disclosure showed a significant positive relationship with financial reporting quality, suggesting that the demands of economic disclosures can lengthen the disclosure process. Governance disclosure, however, showed an insignificant negative relationship, implying that governance disclosures may not influence financial reporting. Additionally, firm size has a significant negative relationship with financial reporting quality. The study extends sustainability reporting research in Nigeria by focusing on the observable timeliness outcome.

**Keywords:** Sustainability Disclosure, Audit Reporting Lag, Financial Reporting Timeliness, Environmental Disclosure, Social Disclosure, Governance Disclosure, and Economic Disclosure.

### 1. Introduction

Financial information loses its decision usefulness to stakeholders if the information does not get to them in time. Therefore, timeliness is an enhancing qualitative characteristic that is important for transparency in the capital market. Audit report lag (ARL) is a measure of timeliness, and it is defined conventionally as the number of days between a firm's year-end and the date the report is signed by the independent auditors. This provides an observable measure of the time required to finalise audited accounts (Owusu-Ansah, 2000; Leventis, Weetman and Caramanis, 2005; Abernathy et al., 2017). Generally, shorter ARL indicates efficiency in closing, control, and audit processes, while longer periods may reduce the relevance of reported information and indicate operational, governance, or audit complexity (Habib and Bhuiyan, 2011; Sultana, Singh and Van der Zahn, 2015).

Corporate reporting has extended beyond conventional financial statements to include environmental, social, governance, and broader economic information. These disclosures can strengthen transparency by reducing information asymmetry, exposing firms to stakeholder scrutiny, and formalising data collection processes. Sustainability disclosure can also lead to new measurement, documentation, and assurance demand, especially where reporting standards are evolving or the disclosure system is weak (Kotsantonis and Serafeim, 2019; Al-Shaer, 2020; Oncioiu et al., 2020; Pucker, 2021). These opposing mechanisms make the relationship between

sustainability disclosure and timeliness of financial reporting theoretically ambiguous. A well-structured sustainability disclosure system may improve organisational discipline and reduce the audit cycle, while a poorly integrated system may increase verification work and delay sign-off.

This ambiguity is especially important for emerging economies. In Nigeria, for example, listed firms operate in an institutional environment in which sustainability reporting developed unevenly during the study period; many disclosures remained voluntary, and enforcement capacity varied. Existing evidence from Nigeria has concentrated mainly on sustainability disclosure and profitability, firm value, or accrual-based financial reporting quality (Akintoye and Kassim, 2022; Adegbayibi, Adu and Oyedokun, 2024). Similarly, evidence outside Nigeria is mixed. Some studies assert that stronger environmental, social, and governance performance leads to improved financial reporting quality (Seker and Sengur, 2021; Ozer, Aktas and Cam, 2024), while others associate extensive sustainability reporting with symbolic disclosure, information overload, or additional reporting burdens (Cohen and Simnett, 2015; Gafni et al., 2024).

This study seeks to identify whether environmental, social, governance, and economic disclosures are associated with audit reporting lag among listed non-financial firms in Nigeria. It analyses observations for 103 firms across 10 sectors between 2012 and 2023. Sustainability disclosures are coded from annual reports, ARL is used to measure financial reporting timeliness, and firm size is controlled for in the robust linear model. The study contributes to the literature in different ways. Firstly, it deviates from other studies that focus on financial performance and discretionary accruals to audit report lag, which is a directly observable timing outcome. Secondly, it disaggregates sustainability disclosure into four dimensions rather than taking it as a single variable and assuming that all components have the same reporting consequences. This distinction proves important because environmental and social disclosures are associated with shorter lags, economic disclosure is associated with longer lags, and governance disclosure is statistically unrelated to lag. Third, it provides large-sample evidence from Nigeria, adding an emerging-market perspective to a literature dominated by developed markets and cross-country databases.

The remainder of the paper reviews the relevant literature and develops the hypotheses, explains the research method, presents the empirical results, discusses their implications, and concludes with recommendations and policy implications.

## 2. Literature Review and Hypothesis Development

### 2.1 Financial Reporting Timeliness and Audit Report Lag

Timeliness refers to making information available while it can still influence users' decisions. Although timely information is not necessarily reliable or complete, delayed information can lose relevance even when it is technically accurate. ARL isolates the period between the financial year-end and the auditor's sign-off date and therefore captures both the preparedness of the reporting entity and the effort required to complete the external audit (Owusu-Ansah and Leventis, 2006; Abernathy et al., 2017). It is widely used because the dates required for its calculation are documented, comparable, and less dependent on researchers' subjective scoring than many other measures of reporting quality.

ARL is influenced by multiple factors, including operational complexity, internal controls, audit committee effectiveness, auditor specialisation, financial distress and firm size (Iyoha, 2012; Habib and Bhuiyan, 2011; Sultana, Singh and Van der Zahn, 2015). Sustainability disclosure may affect lag through two broad channels. An organisational-capability channel predicts shorter lag because firms capable of collecting credible non-financial information may also possess stronger information systems, controls and reporting routines. A reporting burden channel may lead to a longer lag due to additional metrics, estimates, reconciliation and assurance, and data review requirements. Disaggregating disclosure dimensions is therefore necessary to identify which channel dominates.

### 2.2 Environmental Disclosure and Audit Report Lag

Environmental disclosure communicates information about energy, emissions, water, waste, and related environmental risks. Firms that collect this information systematically may have more developed internal controls, stronger risk management processes, and clearer responsibility structures. These capabilities can reduce information asymmetry and improve the auditors' understanding of material environmental exposures (Clarkson et al., 2008; Al-Shaer, 2020). Prior studies generally link better environmental performance or disclosure with more transparent financial reporting (Seker and Sengur, 2021; Ozer, Aktas and Cam, 2024). On the other hand, environmental reporting relies on estimates and may create additional work for verification, particularly when the disclosures and forward looking and not standardised. We therefore hypothesize that:

*H1: Environmental Disclosure is negatively associated with audit report lag.*

### 2.3 Social Disclosure and Audit Report Lag

Social disclosure covers employees, workforce diversity, related stakeholder matters, training, and community investment. Socially responsible firms may experience greater scrutiny from employees. Communities and investors, which can encourage consistent reporting and timely accountability. CSR engagement may be linked with an improved information environment and shorter audit lags, more precise forecasts, and reduced hoarding of bad news (Murata and Hamori, 2021; Chulkov and Wang, 2022). Social disclosure can be qualitative, dispersed across the firm, and difficult to standardise. Firms without an integrated information system may need additional time to reconcile social narratives and financial records. We therefore hypothesize that:

*H2: Social disclosure is negatively associated with audit report lag.*

### 2.4 Governance Disclosure and Audit Report Lag

Governance disclosure provides information about boards, executive remuneration, audit committees, ownership, and oversight processes. Substantive governance transparency can strengthen monitoring, reduce managerial opportunism, and increase the reliability and speed of reporting. Alnabsha et al. (2018) assert that effective audit committees are also associated with shorter audit delays. However, governance disclosure may become a routine compliance exercise that reports structures without demonstrating how effective the disclosures are. Where disclosure scores are high but vary slightly across a firm, it may be difficult to detect a statistical relationship with ARL. Therefore, we hypothesize that:

*H3: Governance disclosure is negatively associated with audit report lag.*

### 2.5 Economic Disclosure and Audit Report Lag

Economic sustainability disclosure provides information on the firm's creation and distribution of economic value, operational expenditure, investment, and tax-related contribution. Economic information that is complete may enhance transparency and help auditors trace the relationship between sustainability claims and financial outcomes (El Qirem et al., 2023). On the other hand, extensive economic disclosure may increase reconciliation and verification demands, especially where the reported items cut across the financial statements, notes, and narrative sections. The volume of information increases the audit process when systems are not integrated, or disclosure

definitions are inconsistent. The hypothesis follows the transparency argument and is stated thus:

*H4: Economic disclosure is negatively associated with audit report lag.*

### 2.6 Theoretical review

Signalling theory proposes that two parties could circumvent the issue of information asymmetry by having one party send a signal that would disclose certain relevant information to the other party (Spence, 1973). Sustainability disclosure can signal managerial competence, commitment to transparency, and long-term orientation. Firms who seek to send credible sustainability signals may invest in reporting systems that facilitate financial statement and audit completion. However, disclosure that is basically symbolic or poorly integrated may be costly to verify and may reduce the speed of producing financial reports.

Stakeholder theory asserts that a business should benefit all its stakeholders and not just its shareholders. It broadens corporate accountability beyond the shareholder to other stakeholders who affect or are affected by the organization (Freeman, 1984). Pressure from these groups can motivate more complete and timely corporate communication. Agency theory provides a similar explanation; managers possess information that providers of capital may not be able to observe directly, and credible disclosures (financial and non-financial) can reduce agency costs (Jensen and Meckling, 1976).

## 3. Research Methodology

The study adopts an ex-post facto design using archival information from the annual reports of non-financial firms listed on the Nigerian Exchange Group. The population comprises 106 firms from the non-financial sector. This cuts across agriculture, conglomerates, construction and real estate, consumer goods, healthcare, industrial goods, information and communication technology, natural resources, oil and gas, and services. These firms were selected purposively when the information required to construct the study variables was available. The final sample contains 103 firms over 2012-2023.

The period begins in 2012, the year in which Nigeria adopted International Financial Reporting Standards, and ends in 2023, the latest year for which complete annual reports were compiled for this study. Annual reports were used because they contain the audited report date, financial statement data, and the narrative disclosures required for content analysis.

### 3.1 Measurement

The dependent variable is audit report lag (ARL), calculated as the number of calendar days from the financial year-end to the date of the independent auditor's report. A lower score indicates a timelier audited financial report. The disclosure indices utilised an unweighted binary approach: each item

receives a score of one when disclosed and zero if otherwise. The total is then divided by the number of applicable items and multiplied by 100. Binary content-analysis indices are widely used where consistent ESG ratings are unavailable (Haniffa and Cooke, 2005; Bhattacharyya, 2014). Firm size is the natural logarithm of total assets. Table 1 summarises the measurements.

**Table 1:** Measurement of variables

| Variables                | Code | Role        | Measurement                                                                                                                                                                                              | Source                                                             |
|--------------------------|------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Audit report lag         | ARL  | Dependent   | Calendar days between fiscal year-end and the auditor's report date. Lower ARL means greater timeliness.                                                                                                 | Owusu-Ansah (2000); Leventis et al. (2005)                         |
| Environmental disclosure | EVD  | Independent | Percentage of six disclosed items: Scope 1, Scope 2 and Scope 3 emissions; energy use; water use; and waste tonnage.                                                                                     | Clarkson et al. (2008); Chithambo and Tauringana (2014)            |
| Social disclosure        | SCD  | Independent | Percentage of five disclosed items: number of employees; CSR expenditure; female employees; women in management; and employee-training expenditure.                                                      | Haniffa and Cooke (2005); Barako (2007)                            |
| Governance disclosure    | GVD  | Independent | Percentage of seven disclosed items: non-executive board size; CEO share ownership; executive-director pay; directors' remuneration; board meetings; audit-committee meetings; and auditor remuneration. | Alnabsha et al. (2018); Muttakin et al. (2015)                     |
| Economic disclosure      | ECD  | Independent | Percentage of six disclosed items: revenue; cost of revenue; marketing/selling expenses; intangible assets; ICT expenses; and income-tax expense.                                                        | Global Reporting Initiative (2016); Michelin and Parbonetti (2012) |
| Firm size                | FSA  | Control     | Natural logarithm of total assets.                                                                                                                                                                       | Dechow et al. (2010); Aljifri and Hussainey (2007)                 |

**Notes:** Disclosure items are coded 1 when present and 0 otherwise. Each index is expressed as a percentage.

### Model and Estimation

The empirical model is specified as follows:

$$ARL_{it} = \beta_0 + \beta_1 EVD_{it} + \beta_2 SCD_{it} + \beta_3 GVD_{it} + \beta_4 ECD_{it} + \beta_5 FSA_{it} + \varepsilon_{it}$$

where  $i$  denotes firms and  $t$  years. Since ARL is measured in days, a negative disclosure coefficient indicates a shorter audit lag and thus greater reporting timeliness.

## 4. Results

### 4.1 Descriptive Statistics and Correlations

**Table 2:** Descriptive statistics

| Variables | Mean  | Median | Maximum | Minimum | Std. Dev. |
|-----------|-------|--------|---------|---------|-----------|
| ARL       | 179.0 | 88.0   | 874.0   | 29.0    | 157.0     |
| EVD       | 1.1   | 0.0    | 83.0    | 0.0     | 8.5       |
| SCD       | 51.0  | 60.0   | 100.0   | 0.0     | 20.0      |
| GVD       | 79.0  | 86.0   | 100.0   | 0.0     | 24.0      |
| ECD       | 84.0  | 83.0   | 100.0   | 0.0     | 18.0      |
| FSA       | 16.0  | 16.0   | 22.0    | 11.0    | 2.1       |

**Notes:** ARL = audit report lag; EVD = environmental disclosure; SCD = social disclosure; GVD = governance disclosure; ECD = economic disclosure; FSA = firm size.

Table 2 shows considerable spread in audit timing. The mean ARL is 179 days, while the median and maximum values are 88 days and 874 days, respectively. This indicates a strongly right-skewed distribution. Environmental disclosure is exceptionally limited. Its mean is 1.1 percent while the median is zero. Social disclosure averages 51 percent, while governance and economic disclosure average 79 and 84 percent, respectively. The contrast suggests that the sampled firms routinely report many governance and conventional economic items but seldom report the selected emissions and resource-use indicators.

**Table 3:** Correlation matrix

| Variable | ARL    | EVD    | SCD   | GVD   | ECD   | FSA   |
|----------|--------|--------|-------|-------|-------|-------|
| ARL      | 1.000  |        |       |       |       |       |
| EVD      | -0.007 | 1.000  |       |       |       |       |
| SCD      | -0.015 | 0.017  | 1.000 |       |       |       |
| GVD      | 0.029  | 0.022  | 0.366 | 1.000 |       |       |
| ECD      | -0.011 | -0.003 | 0.401 | 0.348 | 1.000 |       |
| FSA      | -0.038 | 0.263  | 0.273 | 0.209 | 0.190 | 1.000 |

Table 3 presents the correlation matrix. ARL has near-zero bivariate correlations with the four disclosure measures and firm size. Correlations among social, governance, and economic disclosure range from 0.348 to 0.401, while environmental disclosure is only weakly correlated with the other indices. The highest correlation is 0.401 between social and economic disclosure. Together with a mean variance inflation factor of 1.22, these values do not indicate problematic multicollinearity.

## 4.2 Regression Results

**Table 4:** Robust regression of audit report lag

| Variable | Coefficient | Robust SE | t     | p-value | 95% confidence interval |
|----------|-------------|-----------|-------|---------|-------------------------|
| EVD      | -0.1706     | 0.0576    | -2.96 | 0.003   | [-0.2837, -0.0575]      |
| SCD      | -0.0936     | 0.0307    | -3.05 | 0.002   | [-0.1538, -0.0334]      |
| GVD      | -0.0296     | 0.0436    | -0.68 | 0.498   | [-0.1152, 0.0560]       |
| ECD      | 0.1594      | 0.0410    | 3.89  | <0.001  | [0.0790, 0.2399]        |
| FSA      | -1.5915     | 0.2634    | -6.04 | <0.001  | [-2.1085, -1.0746]      |
| Constant | 104.8619    | 5.2474    | 19.98 | <0.001  | [94.5640, 115.1597]     |

**Note:** Dependent variable: ARL in days.  $F = 17.43$ ; model  $p < 0.001$ ;  $R\text{-squared} = 0.0033$ ; adjusted  $R\text{-squared} = 0.0019$ . Lower ARL indicates more timely reporting.

Environmental disclosure has a negative and statistically significant coefficient ( $\beta = -0.1706$ ,  $p = 0.003$ ). Holding other variables constant, a ten-percentage-point increase in the environmental disclosure index is associated with approximately a 1.71 reduction in ARL. H1 is therefore supported. Given the low mean and zero median of EVD, however, this estimate largely distinguishes a relatively small group of environmental disclosers from firms reporting none of the selected items.

Social disclosure is also negatively associated with ARL ( $\beta = -0.0936$ ,  $p = 0.002$ ). A ten-point increase in SCD corresponds to approximately 0.94 fewer audit-lag days. H2 is supported. Governance disclosure has a negative but statistically insignificant coefficient ( $\beta = -0.0296$ ,  $p = 0.498$ ); H3 is not supported.

Economic disclosure is positively and significantly associated with ARL ( $\beta = 0.1594$ ,  $p < 0.001$ ). A ten-point increase in ECD corresponds to approximately 1.59 additional lag days. This direction is opposite to H4 and is consistent with a reporting-burden explanation. Firm size is negatively associated with ARL ( $\beta = -1.5915$ ,  $p < 0.001$ ). This suggests that larger firms complete audited reporting more quickly. This can possibly be because they possess more developed reporting systems and greater audit-support resources.

Firm size has a negative and significant coefficient ( $\beta = -1.5915$ ,  $p < 0.001$ ). A one-unit increase in the natural logarithm of total assets is associated with a 1.59-day shorter ARL. Larger firms may benefit from greater reporting capacity, specialist staff, established systems, and access to audit resources, despite their operational complexity.

The model is jointly significant ( $F = 17.43$ ,  $p < 0.001$ ), but the  $R\text{-squared}$  of 0.0033 is very low. The disclosure variables and firm size therefore account for less than one per cent of the observed variation in ARL.

## 4.3 Diagnostic Evidence

**Table 5:** Diagnostic Tests for Robust Linear Regression Model

| Variables/Tests                     | Test/P-Values        |
|-------------------------------------|----------------------|
| Heteroskedasticity Test (p)         | 175.5400*** (0.0000) |
| Multicollinearity (Mean VIF)        | 1.2200               |
| Misspecification - Ramsey RESET (p) | 1.6100 (0.1849)      |
| Portmanteau Test (p)                | 73.1722* (0.0422)    |

Post-estimation tests are conducted after estimating the regression model to validate its reliability and predictive accuracy. The heteroskedasticity result justifies robust standard errors, while the low VIF supports coefficient stability with respect to linear dependence among the included regressors. The RESET test provides no evidence against the tested functional form, but it cannot establish the absence of omitted-variable bias. The significant Portmanteau result is important: heteroskedasticity-robust inference alone may not fully address within-firm serial correlation.

## 5. Discussion

The results demonstrate why sustainability disclosure should be examined by dimension rather than collapsed into a single aggregate score. Environmental and social disclosure are associated with shorter audit report lags, economic disclosure is associated with longer lags, and governance disclosure has no statistically detectable association. An aggregate index could conceal these offsetting relationships and lead to an incomplete conclusion about the reporting consequences of sustainability practices.

The negative association between environmental disclosure and ARL supports the organisational-capability and signalling explanations. Producing emissions, energy, water and waste information requires firms to assign responsibility for data, standardise collection procedures and document underlying evidence. Where such systems are substantive, they may improve the broader control environment and enable auditors to obtain information more efficiently. Environmental disclosure can also signal that management is willing to expose its operations to external scrutiny, reducing information asymmetry (Clarkson et al., 2008; Al-Shaer, 2020). The finding is consistent with international evidence associating stronger environmental or ESG performance with higher financial reporting quality (Seker and Sengur, 2021; Ozer, Aktas and Cam, 2024).

The social-disclosure result similarly accords with stakeholder theory. Firms reporting employee, diversity, training and community-related information may face stronger stakeholder monitoring and may adopt more disciplined reporting schedules. Cross-functional processes required to gather employee and CSR information can also institutionalise year-end reporting responsibilities. Prior studies associate social responsibility with improved information environments and lower incentives to withhold adverse information (Murata and Hamori, 2021; Chulkov and Wang, 2022).

Governance disclosure is not significantly associated with ARL. One explanation is limited informational variation: the mean GVD score is 79 per cent, and the median is 86 per cent, suggesting that many firms report the required governance items. Disclosure of board size, meeting frequency, or remuneration does not necessarily demonstrate that boards and audit committees operate effectively. A high compliance score can therefore coexist with weak monitoring. This interpretation is consistent with the distinction between formal governance structures and substantive governance effectiveness.

The findings from this study on Economic Sustainability Disclosure (ECD) and Financial Reporting Quality (FRQ) reveal a statistically significant positive relationship between ECD and timeliness (audit lag), which, when interpreted through the inverse relationship between timeliness and financial reporting quality, suggests that higher economic sustainability disclosures are associated with lower financial reporting quality. This result implies that firms that emphasize economic sustainability disclosures signal long-term strategic planning and stakeholder engagement. The complexity and volume of economic disclosures may lead to longer audit lags. This can ultimately compromise the timeliness and consistency of financial reporting. These challenges may stem from the complexity of economic disclosures, which often involve forward-looking statements, strategic plans, and intangible value propositions that are difficult to quantify and standardize. Consequently, auditors may require more time to assess and verify the reliability of these disclosures, which can lead to delays in the audit process and, consequently, lower financial reporting quality.

The finding for firm size is consistent with the view that larger firms have more sophisticated reporting systems, more experienced finance teams, and stronger incentives to meet capital market deadlines. These resources may outweigh the delay caused by operational complexity.

## 6. Conclusion and Policy Implications

The study investigates the association between four dimensions of sustainability disclosure and timeliness of financial reporting. The findings demonstrate that environmental and social disclosure exhibit statistically significant negative relationships with timeliness (audit lag). Due to the inverse relationship between timeliness and financial reporting quality, this indicates that higher environmental and social disclosures are associated with improved financial reporting quality. This suggests that firms engaging in greater environmental and social disclosures tend to

experience shorter audit lags, which enhances financial transparency and reporting discipline by reducing information asymmetry and aligning stakeholder expectations.

On the other hand, economic disclosure demonstrates a statistically significant positive relationship with timeliness. This implies that higher economic disclosures lead to longer audit lags, which in turn reduces financial reporting quality. This outcome suggests that the complexity and extensive nature of economic disclosures may introduce challenges in the audit process, delaying financial statement finalization and thereby compromising financial reporting quality. Despite the relevance of economic sustainability disclosures to stakeholders seeking insights into a firm's financial stability and growth prospects, the potential delays caused by these disclosures highlight the need for firms to balance comprehensive reporting with the imperative of maintaining timeliness and reliability in financial statements.

Governance Disclosure had no statistically significant relationship with timeliness, indicating that governance disclosures do not directly impact financial reporting quality. This may be because governance disclosures often focus on fulfilling regulatory compliance requirements rather than providing meaningful insights into governance practices that could enhance financial reporting transparency.

Additionally, the control variable, Firm Size, exhibited a significant negative relationship with Audit Report Lag (timeliness), suggesting that larger firms have shorter audit lags, thereby improving financial reporting quality. This indicates that larger firms likely have stronger internal controls, advanced financial reporting systems, and greater resources to facilitate timely audits, enhancing the timeliness and reliability of financial information.

While environmental and social disclosures contribute positively to financial reporting quality by promoting timeliness and transparency, economic disclosures may compromise reporting quality if they lead to prolonged audit processes. The lack of a significant impact from governance disclosures suggests that firms should move beyond compliance-based disclosures and provide substantive governance insights to enhance financial reporting quality. These findings highlight the importance of developing comprehensive reporting frameworks that balance sustainability disclosures with the need for timely, accurate, and high-quality financial reporting.

## 6.1 Policy Implications and Recommendations

Based on the study's findings, several key policy implications and recommendations emerge:

The study found that environmental disclosure has a statistically significant negative relationship with audit lag, indicating improved financial reporting quality. This implies that firms prioritising environmental transparency can enhance the timeliness and reliability of their financial reports by reducing information asymmetry. Therefore, regulatory authorities such as the Financial Reporting Council of Nigeria (FRCN) should develop clear and standardised guidelines for environmental disclosures. These guidelines should focus on material environmental impacts and provide a framework that enables firms to deliver concise, decision-useful environmental information without overburdening the audit process.

The results revealed that social disclosure also has a statistically significant negative relationship with audit lag, suggesting that greater social disclosure enhances financial reporting quality by fostering governance discipline and transparency. To ensure these benefits are realised consistently, a structured reporting framework for social disclosures should be introduced. This framework should standardise the reporting of key social metrics such as employee welfare, occupational health and safety, and community engagement, and encourage firms to integrate these metrics into their regular financial reporting cycles to maintain timeliness.

Governance disclosure was found to have no statistically significant relationship with audit lag, indicating that current governance-related reporting may be more focused on fulfilling regulatory compliance requirements rather than providing actionable insights that could influence financial reporting quality. Firms should therefore be encouraged to move beyond basic compliance and instead provide more qualitative, performance-based governance disclosures. Such disclosures should include meaningful assessments of board effectiveness, details on risk oversight mechanisms, and evidence of ethics and compliance enforcement, thereby making governance reporting a tool for enhancing transparency and financial report credibility.

The findings also indicated that economic disclosure has a statistically significant positive relationship with audit lag, meaning that higher economic disclosures are associated with longer audit delays and, consequently, reduced financial reporting quality. This may be due to the complexity and volume of economic information, which can slow the audit process. To address this, firms should be

encouraged to adopt streamlined reporting formats for economic disclosures that reduce complexity while still providing key sustainability-related financial metrics. Separating core economic sustainability indicators, such as value creation and long-term investment commitments, from supplementary narratives could help auditors review the information more efficiently and improve timeliness.

Lastly, the control variable results showed that larger firms tend to have shorter audit lags, suggesting that strong internal controls, advanced reporting systems, and better resourcing contribute to timelier financial reporting. This highlights the need to build capacity among smaller listed firms, which may lack these advantages. Targeted training programmes on sustainability integration, financial reporting best practices, and the use of audit automation technologies could help smaller firms enhance both the timeliness and quality of their financial reports. Furthermore, encouraging the adoption of digital reporting platforms that integrate financial and sustainability information would further reduce audit preparation time and improve overall reporting efficiency.

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