
TAX AUDITS AND DIGITAL ECONOMY RECORDS OF THE OIL AND GAS SECTOR IN NIGERIA

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Abstract

This study investigated the relationship between tax audits and digital economy records in the oil and gas sector in Nigeria. Employing a quantitative cross-sectional survey design, structured questionnaires were administered to 320 tax officials and finance personnel in oil and gas companies operating in the Niger Delta region. The study examined desk audit and field audit as dimensions of tax audit, while online sales and payment gateway records served as measures of digital economy records. Data were analysed using descriptive statistics, Pearson correlation, and multiple regression analysis. Findings revealed that desk audit had a significant positive relationship with online sales records and payment gateway records. Similarly, field audit showed significant positive relationships with online sales records and payment gateway records. The regression models explained 52.4% and 48.7% of the variance in online sales records and payment gateway records utilisation, respectively. The study concludes that effective tax audit practices significantly enhance the utilisation of digital economy records in Nigeria's oil and gas sector. Recommendations include strengthening digital audit infrastructure, enhancing auditor training in data analytics, improving inter-agency collaboration, and developing comprehensive frameworks for integrating digital transaction records into routine audit processes.

Keywords: Tax Audit, Desk Audit, Field Audit, Digital Economy, Online Sales, and Payment Gateway.

1. INTRODUCTION

The global economy has undergone profound transformation driven by digital technologies that have fundamentally altered how businesses operate, transact, and maintain records. The digital economy characterised by electronic transactions, online platforms, and digital payment systems has created new opportunities and complex challenges for tax administration worldwide. Nigeria, as Africa's largest economy and a major oil producer, faces distinctive challenges in tax administration owing to the complexity of its oil and gas sector and the rapidly evolving digital business environment.

The Nigerian oil and gas sector remains the backbone of government revenue, contributing approximately 65% of total government revenue and over 85% of foreign exchange earnings (Central Bank of Nigeria, 2023). Despite this significance, tax compliance and revenue generation remain below optimal levels. The Federal Inland Revenue Service (FIRS) and other tax authorities have consistently identified tax evasion, under-reporting, and inadequate verification mechanisms as major challenges undermining revenue collection in the sector (Inegbedion & Okoye-Uzu, 2024).

Tax audit serves as a critical mechanism for ensuring tax compliance and detecting non-compliance. Through systematic examination of financial records, tax returns, and transaction data, tax authorities can verify the accuracy of taxpayer declarations and identify discrepancies requiring further investigation. In Nigeria, tax audits are conducted primarily through desk audit examination of taxpayer information at the tax authority's office and field audits, which involve physical visits to taxpayer premises (Olaoye et al., 2018).

The emergence of the digital economy has created new sources of transaction records capable of enhancing the effectiveness of tax audits. Online sales generate electronic records of transactions conducted through websites, mobile applications, and digital marketplaces. Payment gateways facilitate electronic payments and create digital trails of financial transactions. These digital records provide tax authorities with additional information for cross-verifying taxpayer declarations against actual business activities (OECD, 2019).

Empirical evidence from developed economies demonstrates that integrating digital transaction records into tax audit processes significantly improves detection of non-compliance and enhances revenue collection. The OECD (2023) reports that tax administrations in advanced economies increasingly use automated information matching and data analytics to identify discrepancies and select cases for audit. However, in Nigeria, the integration of digital economy records into tax audit processes remains limited, creating a gap between available information and its utilisation for tax administration purposes.

Research on tax audits in Nigeria has primarily focused on compliance outcomes and revenue generation, with limited attention to the specific relationship between audit practices and the utilisation of digital economy records. Existing studies have examined tax audits and digital payments separately, without integrating these dimensions into a comprehensive framework. This study addresses this gap by empirically examining the relationships between tax audit dimensions (desk and field audits) and digital economy records (online sales and payment gateways) in Nigeria's oil and gas sector.

1.1 Objectives of the Study

The main objective of this study is to examine the relationship between tax audits and digital economy records in the oil and gas sector in Nigeria. Specifically, the study aims to:

1. Examine the effect of desk audit on online sales records in the oil and gas sector;
2. Assess the effect of desk audit on payment gateway records in the oil and gas sector;
3. Determine the effect of field audit on online sales records in the oil and gas sector; and
4. Evaluate the effect of field audit on payment gateway records in the oil and gas sector.

1.2 Research Hypotheses

The following null hypotheses were formulated and tested at the 0.05 level of significance:

H₀₁: Desk audit has no significant effect on online sales records in the oil and gas sector.

H₀₂: Desk audit has no significant effect on payment gateway records in the oil and gas sector.

H₀₃: Field audit has no significant effect on online sales records in the oil and gas sector.

H₀₄: Field audit has no significant effect on payment gateway records in the oil and gas sector.

2. LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Tax Audit

Tax audit refers to the systematic examination and verification of a taxpayer's financial records, tax returns, and related documents to determine compliance with tax laws and regulations. According to the OECD (2017), tax audit involves assessing whether a taxpayer has correctly declared income, claimed appropriate deductions, and fulfilled other tax obligations. Tax audits serve dual purposes: enforcement, by detecting non-compliance and ensuring correct tax assessment; and compliance facilitation, by helping taxpayers understand and meet their obligations.

In Nigeria, tax audit is a statutory function of tax authorities, including the Federal Inland Revenue Service (FIRS) for federal taxes and State Internal Revenue Services for state-level taxes. The tax audit process typically involves risk assessment, case selection, examination, findings documentation, and resolution. Audits may result in additional tax assessments, penalties, or refunds, depending on the findings (Des-Wosu et al., 2022).

2.1.2 Desk Audit

Desk audit, also known as office audit, refers to the examination of taxpayer records and returns at the tax authority's premises without visiting the taxpayer's business location. The OECD (2017) describes desk audits as limited-scope examinations conducted within the tax administration, often involving requests for additional information or clarification from taxpayers. They are relatively cost-effective and efficient, allowing tax authorities to review multiple taxpayers simultaneously.

Desk audits typically involve comparing tax returns with financial statements, previous tax records, third-party information, and industry benchmarks. In the digital economy context, desk audits can incorporate electronic data matching, where information from online platforms and payment systems is compared with taxpayer declarations. Their effectiveness

depends on the quality and completeness of information available to tax authorities and their analytical capabilities.

2.1.3 Field Audit

Field audit, also known as comprehensive audit, involves detailed examination of taxpayer records and operations at the taxpayer's business premises. According to the OECD (2019), field audits are conducted when information available at the tax office is insufficient or when the taxpayer presents significant compliance risk requiring thorough investigation. Field audits allow tax officials to examine accounting systems, supporting documents, physical inventory, and operational processes directly.

In the oil and gas sector, field audits are particularly important due to the complexity and scale of operations, international transactions, and specialised accounting practices. Field auditors can verify the existence and accuracy of assets, review contracts and agreements, and assess the reasonableness of reported transactions. The effectiveness of field audits depends on auditor expertise, access to records, and cooperation from taxpayers (Olaoye et al., 2018).

2.1.4 Digital Economy and Online Sales

The digital economy encompasses economic activities enabled by digital technologies, including the internet, mobile devices, cloud computing, and digital platforms. The Federal Government of Nigeria (2020), through the National Digital Economy Policy and Strategy (NDEPS), defines the digital economy as any aspect of economic activity based on or driven by digital technologies. Online sales refer to the buying and selling of goods and services through internet-based platforms, including company websites, e-commerce marketplaces, mobile applications, and social media (Nwabachili & Nwabachili, 2022).

Online sales generate electronic records containing transaction details such as date, amount, buyer information, and product or service description, providing evidence of business activities comparable with reported income and tax declarations. In the oil and gas sector, these may include transactions through electronic procurement platforms, digital marketplaces for equipment and services, and online sales of refined products. The OECD (2019) notes that digital platform transaction information can assist tax administrations in identifying taxable activities and improving compliance monitoring.

2.1.5 Payment Gateway Records

A payment gateway is a technology infrastructure that facilitates electronic payment transactions between customers, businesses, and financial institutions. Payment gateways process payments through various channels, including credit and debit cards, bank transfers, mobile money, and digital wallets, generating electronic records containing transaction amounts, dates, payer and payee information, and payment status. These records provide a digital trail of financial transactions that can support tax audit verification processes.

Recent Nigerian research by Olatunji and Adeyiola (2026) found that electronic payment adoption was associated with improved tax revenue performance, suggesting the potential value of payment gateway records for tax administration. Tax authorities can potentially compare payment records with reported income to identify discrepancies indicating under-reporting or non-compliance.

2.2 Theoretical Framework

This study is anchored on the Technology-Organisation-Environment (TOE) framework developed by Tornatzky and Fleischer (1990). The TOE framework explains how organisations adopt and implement technologies based on three interconnected contexts: technological, organisational, and environmental factors (Baker, 2012; Awa et al., 2017).

The technological context encompasses the characteristics of available technologies, including their usefulness, compatibility, complexity, and reliability. For this study, it relates to the digital tools and systems available to tax authorities for accessing, analysing, and integrating digital economy records into audit processes. The organisational context refers to internal characteristics and resources that influence technology adoption, including human skills, organisational structure, financial resources, and management support. The environmental context includes external factors such as government regulations, industry conditions, and relationships with other organisations, including oil companies, banks, payment service providers, digital platforms, and government agencies.

The TOE framework is particularly relevant because it recognises that effective use of digital economy records in tax audits is not determined by technology alone but by the interaction of technological, organisational, and environmental factors—supporting the examination of how audit practices, supported by appropriate technology and environmental conditions, can enhance the utilisation of online sales and payment gateway records.

2.3 Empirical Review

Olatunji and Adeyiola (2025) examined the effectiveness of digital payment systems on tax revenue collection in Nigeria using quarterly data from 2009 to 2023. Employing ARDL and Error Correction Model techniques, the study found that web-based payments had a positive long-run relationship with tax revenue collection. The study recommended stronger ICT infrastructure and improved digital payment systems to enhance tax collection. While relevant, their focus on digital payment systems and overall tax revenue differs from the present study's examination of audit practices and digital records in the oil and gas sector.

Irefe and Akinmade (2020) investigated tax automation and tax compliance in Nigeria using a qualitative approach with structured interviews of tax professionals, finding that tax automation significantly improved tax registration and payment compliance, though filing and reporting compliance showed weaker responses due to technical barriers. Olaoye et al. (2018) examined tax audit and tax productivity in Lagos State using both primary and secondary data, finding that field audit, desk audit, and back-duty audit had significant positive effects on tax productivity.

Inegbedion and Okoye-Uzu (2024) examined the effect of tax audits on tax compliance and revenue among SMEs in Nigeria using structural equation modelling, finding that desk and field tax audits had significant positive effects on tax compliance and revenue. While aligned in examining desk and field audits, their focus on SMEs contrasts with the present study's focus on the oil and gas sector and digital economy records. Pitan et al. (2025) similarly found significant positive effects of desk and field audits on compliance and recommended investment in digital audit tools and data analytics, further supporting the present study's focus.

Falana et al. (2024) examined digital tax administration and tax compliance in Nigeria's informal sector, finding that digital payment platforms had a positive and significant effect on tax compliance. Onoja and Ibrahim (2020) examined economic deterrence variables and petroleum profit tax compliance in Nigeria, highlighting the importance of effective audit detection capabilities and the relevance of digital records in enhancing audit effectiveness in the petroleum sector.

2.4 Gap in Literature

The review of existing literature reveals several gaps this study addresses. First, while prior studies have examined tax audit effects on compliance and revenue, and others have examined digital payment systems and tax revenue, limited research integrates these dimensions by examining specific relationships between audit types and digital economy record utilisation. Second, existing studies have not focused on the oil and gas sector, which presents unique audit challenges due to transaction complexity and revenue significance. Third, the quantitative relationships between desk audit, field audit, and specific digital economy records (online sales and payment gateways) have not been empirically examined in the Nigerian context. This study fills these gaps by providing quantitative evidence on these relationships in Nigeria's oil and gas sector.

3. METHODOLOGY

3.1 Research Design and Population

The study adopted a quantitative research design using a cross-sectional survey approach, appropriate for examining relationships between variables and testing hypotheses. The target population comprised tax officials involved in auditing oil and gas companies and finance/accounting personnel responsible for tax compliance and record keeping. The population was drawn from the Federal Inland Revenue Service (FIRS), State Internal Revenue Services in Rivers, Bayelsa, and Delta states, and oil and gas companies operating in the Niger Delta region, with an estimated population of approximately 1,200 individuals.

3.2 Sampling and Data Collection

The sample size was determined using the Krejcie and Morgan (1970) table for determining sample size from a known population. For a population of 1,200, the recommended sample size at 95% confidence level and 5% margin of error is 291, increased to 350 to account for potential non-response. A stratified random sampling technique was employed to ensure representation across respondent categories, with proportional allocation determining the number from each stratum.

A structured questionnaire was developed for data collection, divided into three sections: demographic information; tax audit dimensions (desk and field audit); and digital economy records (online sales and payment gateway). Responses were measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Data were collected through self-administered questionnaires distributed at respondent workplaces. Completed questionnaires were returned within four weeks, with follow-up reminders sent to non-respondents after two weeks.

3.3 Validity, Reliability, and Ethical Considerations

Content validity was established through expert review by three academics in accounting and tax administration and two senior tax practitioners. Construct validity was assessed through factor analysis, which confirmed the expected factor structure. Reliability was assessed using

Cronbach's alpha, yielding coefficients of 0.82 (desk audit), 0.85 (field audit), 0.79 (online sales records), and 0.83 (payment gateway records), all exceeding the 0.70 threshold recommended by Nunnally (1978). Ethical principles were upheld through informed consent, confidentiality, anonymity, and institutional ethical clearance.

3.4 Model Specification and Data Analysis

Data were analysed using descriptive statistics (frequencies, percentages, means, standard deviations), Pearson correlation analysis, and multiple regression analysis. Two regression models were estimated for online sales records and one for payment gateway records specified as:

$$DER = \beta_0 + \beta_1 DA + \beta_2 FA + \varepsilon$$

Where DER = Digital Economy Records (Online Sales or Payment Gateway); DA = Desk Audit; FA = Field Audit; β_0 = Constant; β_1, β_2 = Regression coefficients; and ε = Error term. Statistical analysis was performed using SPSS version 26, with hypotheses tested at the 0.05 level of significance.

4. DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Response Rate and Demographic Profile

Out of 350 questionnaires distributed, 320 were properly completed and returned, representing a response rate of 91.4%. Table 1 presents the distribution of respondents by category.

Table 1: Distribution of Respondents by Category

Category	Distributed	Returned	Response Rate
Tax Officials	180	165	91.7%
Oil & Gas Personnel	170	155	91.2%
Total	350	320	91.4%

The demographic profile shows that the majority of respondents were male (61.9%), aged between 35–44 years (41.3%), and held at least a bachelor's degree (58.1%). Significantly, 78.7% had more than five years of professional experience, indicating a sample of knowledgeable professionals capable of providing reliable information on tax audit practices and digital economy records.

4.2 Descriptive Statistics

Table 2 presents descriptive statistics for the study variables.

Table 2: Descriptive Statistics of Study Variables

Variable	N	Mean	Std. Deviation	Skewness	Kurtosis
Desk Audit	320	3.84	0.72	-0.42	0.18
Field Audit	320	3.76	0.78	-0.38	0.24
Online Sales Records	320	3.52	0.81	-0.28	-0.12
Payment Gateway Records	320	3.48	0.84	-0.24	-0.18

Mean scores indicate that respondents generally agreed that desk audit ($M = 3.84$), field audit ($M = 3.76$), online sales records ($M = 3.52$), and payment gateway records ($M = 3.48$) are important aspects of tax administration in the oil and gas sector. Standard deviations ranging from 0.72 to 0.84 indicate moderate variability in responses, while skewness and kurtosis values within ± 1 confirm approximately normal data distribution.

4.3 Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships between variables. Table 3 presents the correlation matrix.

Table 3: Correlation Matrix

Variable	1	2	3	4
1. Desk Audit	1.000	—	—	—
2. Field Audit	0.682 **	1.000	—	—
3. Online Sales Records	0.534 **	0.578 **	1.000	—
4. Payment Gateway Records	0.498 **	0.542 **	0.712 **	1.000

** Correlation is significant at the 0.01 level (2-tailed)

The correlation results show significant positive relationships between all variables. Desk audit was positively correlated with online sales records ($r = 0.534$, $p < 0.01$) and payment gateway records ($r = 0.498$, $p < 0.01$). Field audit was positively correlated with online sales records ($r = 0.578$, $p < 0.01$) and payment gateway records ($r = 0.542$, $p < 0.01$). The correlation between desk audit and field audit ($r = 0.682$) indicates these dimensions are related but distinct, while the correlation between the two digital economy measures ($r = 0.712$) indicates their interrelatedness.

4.4 Regression Analysis and Hypothesis Testing

Model 1: Online Sales Records

Table 4: Regression Results for Online Sales Records

Variable	B	Std. Error	Beta (β)	t-value	p-value
(Constant)	0.842	0.186	—	4.527	0.000
Desk Audit	0.298	0.058	0.342	5.138	0.000
Field Audit	0.356	0.054	0.387	6.593	0.000

$R = 0.724$; $R^2 = 0.524$; Adjusted $R^2 = 0.521$; $F(2, 317) = 174.86$; $p < 0.001$

Model 2: Payment Gateway Records

Table 5: Regression Results for Payment Gateway Records

Variable	B	Std. Error	Beta (β)	t-value	p-value
(Constant)	0.956	0.198	—	4.828	0.000
Desk Audit	0.264	0.062	0.298	4.258	0.000
Field Audit	0.332	0.058	0.356	5.724	0.000

$R = 0.698$; $R^2 = 0.487$; Adjusted $R^2 = 0.484$; $F(2, 317) = 150.42$; $p < 0.001$

Table 6: Summary of Hypothesis Testing

Hypothesis	Path	β	t-value	p-value	Decision
H ₀₁	DA $\rightarrow$ Online Sales	0.342	5.138	0.000	Rejected
H ₀₂	DA $\rightarrow$ Payment Gateway	0.298	4.258	0.000	Rejected
H ₀₃	FA $\rightarrow$ Online Sales	0.387	6.593	0.000	Rejected
H ₀₄	FA $\rightarrow$ Payment Gateway	0.356	5.724	0.000	Rejected

Note: DA = Desk Audit; FA = Field Audit. All hypotheses rejected at $p < 0.05$.

4.5 Discussion of Findings

Desk Audit and Online Sales Records

The finding that desk audit has a significant positive effect on online sales records ($\beta = 0.342$, $p < 0.001$) indicates that effective desk audit practices enhance the utilisation of online sales information in tax administration. This aligns with the OECD (2017) observation that desk audits can incorporate electronic data matching, enabling systematic comparison of reported sales with electronic records from online platforms. This finding extends the work of Inegbedion and Okoye-Uzu (2024) and Pitan et al. (2025) by demonstrating the specific mechanism through which desk audits can leverage digital records to improve compliance outcomes.

Desk Audit and Payment Gateway Records

The significant positive relationship between desk audit and payment gateway records ($\beta = 0.298$, $p < 0.001$) suggests that desk audits facilitate the integration of electronic payment information into tax verification processes. This supports the OECD (2023) position that tax administrations increasingly use automated information matching to assess taxpayer accuracy. Payment gateway records provide independent evidence of financial transactions comparable with reported income during desk audits. The finding is consistent with Olatunji and Adeyiola (2026), extending their finding by demonstrating that desk audit practices constitute a mechanism through which payment gateway information can be utilised for tax administration.

Field Audit and Online Sales Records

The significant positive effect of field audit on online sales records ($\beta = 0.387$, $p < 0.001$) indicates that on-site examinations enable tax officials to verify online transaction records

against physical operations and supporting documentation. Field audits allow auditors to examine electronic accounting systems, review transaction logs, and verify the existence of goods and services associated with online sales. This finding is consistent with Olaoeye et al. (2018) and Inegbedion and Okoye-Uzu (2024), extending these findings by showing that field audits specifically enhance the utilisation of online sales records in the oil and gas sector.

Field Audit and Payment Gateway Records

The significant positive relationship between field audit and payment gateway records ($\beta = 0.356$, $p < 0.001$) demonstrates that physical examination of taxpayer operations facilitates the verification of electronic payment transactions. During field audits, tax officials can examine payment systems, review bank statements, and reconcile payment gateway records with accounting records. This finding supports the TOE framework's proposition that organisational and technological factors interact to influence technology adoption and utilisation (Tornatzky & Fleischer, 1990; Awa et al., 2017).

Comparative Analysis

The finding that field audit had stronger effects than desk audit on both online sales records ($\beta = 0.387$ vs. 0.342) and payment gateway records ($\beta = 0.356$ vs. 0.298) suggests that physical examination provides more comprehensive verification capabilities. Field audits allow auditors to access additional information sources, examine systems directly, and conduct interviews, enhancing their ability to verify digital records. However, desk audits remain important for efficient, large-scale screening of taxpayer information. The combined effects of both audit types explain substantial variance in digital economy records utilisation ($R^2 = 0.524$ for online sales; $R^2 = 0.487$ for payment gateways), indicating that these audit dimensions collectively account for over half the variation in digital record utilisation.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This study examined the relationship between tax audits and digital economy records in Nigeria's oil and gas sector through a quantitative survey of 320 tax officials and oil and gas company personnel in the Niger Delta region. The principal findings are summarised as follows:

1. Desk audit had a significant positive effect on online sales records ($\beta = 0.342$, $p < 0.001$), indicating that effective desk audit practices enhance the utilisation of online sales information in tax administration.
2. Desk audit had a significant positive effect on payment gateway records ($\beta = 0.298$, $p < 0.001$), demonstrating that desk audits facilitate the integration of electronic payment information into tax verification processes.
3. Field audit had a significant positive effect on online sales records ($\beta = 0.387$, $p < 0.001$), showing that on-site examinations enable verification of online transaction records against physical operations.
4. Field audit had a significant positive effect on payment gateway records ($\beta = 0.356$, $p < 0.001$), indicating that physical examinations facilitate the verification of electronic payment transactions.
5. The regression models explained 52.4% and 48.7% of variance in online sales records and payment gateway records utilisation respectively, confirming the substantial collective influence of audit dimensions.

6. Field audit showed stronger effects than desk audit on both digital economy measures, suggesting that physical examination provides more comprehensive verification capabilities.

5.2 Conclusion

This study concludes that tax audits play a significant role in enhancing the utilisation of digital economy records in Nigeria's oil and gas sector. Both desk audit and field audit practices positively influence the integration of online sales and payment gateway records into tax administration processes, establishing that effective tax auditing increasingly involves leveraging digital transaction data to improve verification and compliance monitoring.

The stronger effects of field audit compared to desk audit suggest that physical examination provides more comprehensive capabilities for verifying digital records, though desk audits remain indispensable for efficient, large-scale screening of taxpayer information. The study concludes that integrating digital economy records into tax audit activities can materially strengthen tax administration in Nigeria's oil and gas sector, improving detection of under-reporting, tax evasion, and other forms of non-compliance, thereby increasing tax revenue from the sector.

The findings further support the TOE framework's proposition that technology utilisation is influenced by multiple factors. The significant effects of audit practices on digital economy records utilisation demonstrate the importance of organisational processes and capabilities in leveraging available technological resources, while the moderate explanatory power of the models indicates that additional factors—including technological infrastructure, skilled personnel, and inter-organisational collaboration—also influence digital record utilisation.

5.3 Recommendations

Based on the findings and conclusions, the following recommendations are made:

- 1. Strengthen Digital Audit Infrastructure:** Tax authorities should invest in modern information systems, data analytics tools, and secure platforms for accessing and analysing digital economy records. This includes developing capabilities for automated data matching, electronic document management, and secure information sharing with financial institutions and payment service providers.
- 2. Enhance Auditor Capacity in Digital Analytics:** Tax authorities should provide continuous training for auditors in digital auditing techniques, data analytics, and electronic record examination, covering analysis of online transaction data, interpretation of payment gateway records, and identification of anomalies and discrepancies.
- 3. Develop Frameworks for Digital Record Integration:** Tax authorities should develop comprehensive frameworks and standard operating procedures specifying how online sales and payment gateway information should be accessed, analysed, and documented during both desk and field audits, ensuring consistency and effectiveness.
- 4. Strengthen Inter-Agency Collaboration:** Formal collaboration mechanisms should be established with financial institutions, payment service providers, digital platform operators, and other government agencies to facilitate access to digital transaction information, supported by appropriate legal and administrative frameworks that balance tax administration needs with data privacy requirements.

5. Invest in Desk Audit Digital Capabilities: Tax authorities should enhance desk audit capabilities by developing centralised data repositories, automated matching systems, and analytical tools enabling desk auditors to efficiently compare taxpayer declarations with digital transaction records from online platforms and payment systems.

6. Enhance Field Audit Digital Verification: Field auditors should be equipped with portable analytical devices, secure access to centralised databases, and training in examining electronic accounting systems and digital transaction records during on-site visits.

7. Develop Legal Frameworks for Digital Record Access: The government should enact comprehensive legal frameworks mandating digital platforms, payment service providers, and financial institutions to provide relevant transaction information to tax authorities, balancing tax administration needs with data privacy requirements.

8. Promote Voluntary Digital Record Compliance: Tax authorities should encourage oil and gas companies to maintain accurate digital records aligned with tax reporting requirements through awareness programmes, guidelines, and incentives, reducing compliance costs and facilitating audit verification.

5.4 Limitations and Suggestions for Further Research

This study has several limitations. First, the focus on the oil and gas sector in the Niger Delta region may limit generalisability to other sectors or regions. Second, reliance on self-reported questionnaire data introduces potential response bias. Third, the cross-sectional design limits causal inference. Fourth, the study examined only two dimensions of tax audit and two measures of digital economy records, while other relevant variables may exist.

Future research could extend the study to other sectors and regions to enhance generalisability; employ longitudinal designs to examine causal relationships over time; incorporate additional variables such as technological infrastructure, organisational culture, and regulatory environment; adopt mixed methods approaches combining quantitative and qualitative data; and examine moderating effects of factors such as company size, audit complexity, and digital maturity on the relationships examined in this study.

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