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EXPLORING THE APPLICABILITY OF FORENSIC AUDITING TECHNIQUES IN THE DETECTION OF TAX EVASION IN FIRS HEAD QUARTER ABUJA

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ABSTARCT

This research examined the use of forensic auditing methods for detecting tax evasion at the Federal Inland Revenue Service (FIRS) headquarters in Abuja. The research evaluated forensic auditing methods including ratio analysis, data mining and data analytics to determine their individual impact on detecting fraudulent tax activities. The assessment evaluated these techniques based on their individual impact on tax evasion detection rate, ability to uncover unreported income and their effect on taxpayer compliance respectively. The study employed a descriptive survey method to obtain data directly from FIRS personnel through a standardized questionnaire. The research demonstrates that forensic auditing techniques especially data mining prove effective for tax evasion detection at FIRS Headquarters in Abuja. Data analytics had a significant effect on taxpayer's compliance. The study used ratio analysis as a forensic auditing tool however it does not have a statistically significant effect on the detection of tax evasion. Overall, the study discloses that FIRS is ready to employ forensic auditing techniques. This research indicates that forensic methods particularly data mining and data analytics when applied practically will boost compliance and decrease revenue losses.

Keywords: Forensic auditing, ratio analysis, data mining, data analytics, tax evasion, FIRS, taxpayer compliance

INTRODUCTION

Tax evasion is a global challenge, eroding government revenues and impeding economic progress, with annual losses estimated at 4–10% of global GDP due to illicit financial activities like underreported income and fraudulent deductions (OECD, 2021). In Sub-Saharan Africa, weak tax enforcement exacerbates these losses, with West African nations losing up to 15% of potential tax revenue, contributing to fiscal deficits and reliance on external debt (African Tax Administration Forum, 2022; Waziri, 2020). In Nigeria, tax evasion significantly undermines fiscal capacity, reducing funds for critical infrastructure, healthcare, and education while deepening income inequality (Ibadin & Embele, 2023). The Federal Inland Revenue Service (FIRS) has implemented reforms, including digital tax platforms, online filing systems, taxpayer education, and strengthened audits, to enhance compliance (FIRS, 2022). Yet, sophisticated evasion schemes—such as falsified records, transfer pricing abuse, and asset concealment—persist, costing Nigeria an estimated 3–5% of GDP annually (Eke & Ogedegbe, 2024).

At FIRS Headquarters in Abuja, the potential of forensic auditing to address these challenges remains underexplored. Globally, tax authorities employ forensic techniques like ratio analysis, data mining, and data analytics to detect complex fraud and improve compliance (PwC, 2021). However, empirical evidence on their practical application within FIRS is scarce, with existing studies relying on theoretical models or secondary data rather than context-specific implementation (Akinyele & Yusuf, 2022; Adamu et al., 2025). This gap limits FIRS's ability to adopt data-driven enforcement strategies tailored to Nigeria's unique tax challenges. This study examines the effectiveness of forensic auditing techniques (ratio analysis, data mining, and data analytics) in detecting tax irregularities, uncovering unreported income, and enhancing compliance at FIRS Headquarters, aiming to provide evidence-based insights for strengthening Nigeria's tax administration.

This study provides critical insights into enhancing tax enforcement at FIRS Headquarters through forensic auditing techniques, offering value to multiple stakeholders. For FIRS management, it identifies operational gaps and informs targeted training to strengthen fraud detection (Eke & Ogedegbe, 2024). Policymakers gain evidence to assess the benefits of forensic auditing for Nigeria's public revenue system, supporting data-driven reforms (Ibadin & Embele, 2023). Academics and researchers benefit from expanded literature on forensic auditing in developing economies, addressing a gap in context-specific studies (Akinyele & Yusuf, 2022). For the Nigerian public and taxpayers, the

study promotes transparency by demonstrating how forensic techniques can reduce fiscal losses, fostering trust in tax administration (Adamu et al., 2025).

Despite FIRS's efforts to curb tax evasion through digital reforms and enhanced audits, Nigeria continues to face significant revenue losses due to sophisticated evasion tactics, including income concealment, falsified records, and transfer pricing abuse (OECD, 2021; Ibadin & Embele, 2023). Traditional audit methods, even with digital support, struggle to detect these complex schemes, threatening Nigeria's fiscal stability and development goals (James, 2016). Forensic auditing techniques (such as ratio analysis, data mining, and data analytics) have proven effective globally in identifying fraud and boosting compliance (Wells, 2014; PwC, 2021). However, their practical implementation and impact at FIRS Headquarters in Abuja remain largely unstudied, with limited empirical data on their effectiveness in detecting irregularities, uncovering hidden income, or improving taxpayer compliance (Eke & Ogedegbe, 2024; Akinyele & Yusuf, 2022). This lack of context-specific evidence hinders FIRS's ability to innovate enforcement strategies and adopt data-driven approaches. This study investigates how these forensic techniques can enhance tax evasion detection at FIRS Headquarters, addressing the gap in empirical, Nigeria-specific research to inform robust tax administration reforms.

This study aims to evaluate the effectiveness of forensic auditing techniques in detecting and mitigating tax evasion at the Federal Inland Revenue Service (FIRS) Headquarters in Abuja, Nigeria. Specifically, it seeks to:

1. Determine the extent to which ratio analysis enhances the detection of tax irregularities.
2. Assess the effectiveness of data mining in identifying hidden or unreported taxable income.
3. Examine the impact of data analytics on improving taxpayer compliance levels.
4. Investigate the readiness and willingness of FIRS management and staff to adopt forensic auditing techniques.

LITERATURE REVIEW

Concept of Tax Evasion

Tax evasion involves the deliberate, unlawful avoidance of tax obligations through practices such as underreporting income, inflating deductions, or using shell entities, transfer pricing abuse, or falsified records (Murphy, 2019). In Nigeria, tax evasion significantly reduces government revenue, undermining infrastructure development, public services, and economic equity (Ibadin & Embele, 2023). Despite FIRS's reforms, including digital platforms and

enhanced audits, evasion persists due to weak enforcement and limited investigative capacity (Eke & Ogedegbe, 2024). These challenges highlight the need for advanced forensic techniques to strengthen tax administration.

Concept of Forensic Auditing

Forensic auditing combines accounting, investigative methods, and legal expertise to detect financial fraud, producing evidence admissible in court (Crumbley et al., 2017). Unlike traditional audits, forensic audits target suspected fraud, using tools like Continuous Monitoring Programme (CMP) software to identify anomalies in financial records and tax returns (Akinyele & Yusuf, 2022). At FIRS, such techniques could enhance detection of sophisticated evasion schemes, addressing gaps in conventional auditing approaches.

Empirical Review

Research highlights forensic auditing's role in fraud detection. Okoye and Ezejiofor (2021) found forensic methods effective in uncovering public sector fraud in Nigeria, enhancing accountability but not focusing on tax-specific applications. Adebisi and Gbegi (2015) demonstrated forensic auditing's impact on reducing fraud in Nigerian public institutions, yet their study did not address FIRS's operational context. Okoye and Gbegi (2013) emphasized training and technology for forensic success, but lacked focus on tax evasion or specific techniques like data analytics.

Regionally, Waziri (2020) showed data mining and analytics improved tax compliance in West Africa, supporting their relevance for FIRS. Recent studies confirm these findings: Ibadin and Embele (2023) found forensic audits reduced tax fraud in South-South Nigeria, while Eke and Ogedegbe (2024) linked forensic techniques to improved tax administration. Adamu et al. (2025) highlighted asset analysis's role in detecting fraud in North Central Nigeria's revenue services.

Despite this, few studies examine ratio analysis, data mining, and data analytics specifically at FIRS Headquarters, leaving gaps in understanding their practical impact and staff readiness (Akinyele & Yusuf, 2022). This study addresses these gaps by evaluating these techniques' effectiveness and FIRS's preparedness for their adoption.

Theoretical Review

Fraud Triangle Theory

Cressey's (1953) Fraud Triangle Theory posits that fraud occurs when pressure, opportunity, and rationalization converge. In tax evasion, financial

pressures (e.g., economic hardship) and weak controls (e.g., poor FIRS monitoring) create opportunities, while rationalizations justify misconduct. Forensic techniques like data mining reduce opportunities by detecting anomalies, enhancing transparency (Dorminey et al., 2010).

Deterrence Theory

Becker's (1968) Deterrence Theory suggests that perceived risks of detection and punishment deter illegal acts. Data analytics strengthens FIRS's detection capabilities, increasing audit risks and legal consequences, thus discouraging tax evasion (Wells, 2014).

Agency Theory

Jensen and Meckling's (1976) Agency Theory explains conflicts between principals (e.g., FIRS) and agents (e.g., taxpayers) when agents prioritize personal gains, such as underreporting income. Forensic auditing, particularly ratio analysis, mitigates information asymmetries by monitoring financial discrepancies, though its limited impact ($\beta = 0.372$, $p = 0.381$) suggests contextual challenges (Ibadin & Embele, 2023). These theories collectively frame how forensic techniques address tax evasion motivations and enhance enforcement at FIRS.

METHODOLOGY

This study adopted a descriptive survey design to assess perceptions of forensic auditing techniques among staff at the Federal Inland Revenue Service (FIRS) Headquarters in Abuja, Nigeria. The population comprised 426 staff from the Audit, Compliance, and Investigation departments, selected for their roles in tax enforcement and fraud detection. A purposive sample of 60 senior staff (20 per department, Assistant Directors and above) was chosen to ensure expertise in forensic auditing and tax compliance, with the sample size justified by the exploratory nature of Partial Least Squares Structural Equation Modeling (PLS-SEM), which is effective for smaller samples (Hair et al., 2019). This approach enabled targeted insights into the application of ratio analysis, data mining, and data analytics for detecting tax evasion.

Data were collected using a structured Google Forms questionnaire, comprising four sections: demographics (e.g., gender, experience), tax evasion indicators (irregularity detection, unreported income, compliance changes), forensic techniques (ratio analysis, data mining, data analytics), and FIRS readiness. Each section used a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), pretested for reliability. Data were analyzed with SPSS 25 for descriptive statistics (e.g., frequencies, means) and SmartPLS for PLS-SEM to evaluate relationships between forensic techniques and tax evasion indicators.

Self-report bias is a limitation; future studies should incorporate triangulation with archival data to enhance validity (Hair et al., 2019).

RESULTS AND DISCUSSION

This section presents the findings from a survey of 60 senior staff (Assistant Directors and above) at the Federal Inland Revenue Service (FIRS) Headquarters in Abuja, Nigeria, analyzing the effectiveness of forensic auditing techniques (ratio analysis, data mining, data analytics) on tax evasion indicators (detection rate of irregularities, volume of unreported income, taxpayer compliance levels). Descriptive and inferential statistics, analyzed via SPSS 25 and SmartPLS, provide insights into staff perceptions and technique impacts.

Descriptive Statistics

Table 4.1 summarizes respondent demographics. The sample is 53.3% female, evenly distributed across Audit, Compliance, and Investigation departments (33.3% each). Most respondents have 6–10 years of service (38.3%) and hold HND/B.Sc. degrees (56.7%). Descriptive statistics for dependent variables show strong agreement (mean scores: 3.72 for irregularity detection, 3.65 for unreported income, 3.70 for compliance) that forensic audits enhance detection and compliance. Independent variables (ratio analysis: mean = 3.58; data mining: 3.69; data analytics: 3.66) and organizational readiness (mean = 3.65) also received positive perceptions, though readiness is not fully optimized, suggesting infrastructure and training gaps (Eke & Ogedegbe, 2024).

Table 4.1: Demographic Characteristics of Respondents

Characteristic	Category	Frequency	Percent
Gender	Female	32	53.3
	Male	28	46.7
	Total	**60**	**100**
Department	Audit	20	33.3
	Compliance	20	33.3
	Investigation	20	33.3
	Total	**60**	**100**
Years in Service	1–5	11	18.3
	6–10	23	38.3
	11–15	14	23.3
	16–20	12	20.0
	Total	**60**	**100**
Education Level	HND/B.Sc.	34	56.7
	M.Sc./MBA	25	41.7
	Ph.D.	1	1.7
	Total	**60**	**100**

Source: Author's computation using SPSS

Results

Partial Least Squares Structural Equation Modeling (PLS-SEM) assessed relationships between forensic techniques and tax evasion indicators (Hair et al., 2019). Table 4.5 shows data mining significantly predicts unreported income detection ($\beta = 0.667$, $t = 9.911$, $p < 0.001$), aligning with Fraud Triangle Theory by reducing opportunities for hidden income (Dorminey et al., 2010). Data analytics positively impacts compliance levels ($\beta = 0.453$, $t = 2.697$, $p = 0.007$), supporting Deterrence Theory's emphasis on perceived detection risks (Wells, 2014). However, ratio analysis does not significantly affect irregularity detection ($\beta = 0.372$, $t = 0.875$, $p = 0.381$), likely due to its reliance on structured financial data, which struggles with complex, unstructured evasion schemes at FIRS (Ibadin & Embele, 2023).

Table 4.5: Structural Model

Model	B	t-value	p-value
RA → DR	0.372	0.875	0.381
DM → VU	0.667	9.911	0.000
DA → CT	0.453	2.697	0.007

Source: Author's computation using SmartPLS

Table 4.6: Model Explanatory Power (R^2)

Model	R^2	Adjusted R^2
RA → DR	0.138	0.124
DM → VU	0.445	0.435
DA → CT	0.205	0.191

Source: Author's computation using SmartPLS

Discussion of Findings

The findings confirm that data mining and data analytics significantly enhance tax evasion detection at FIRS. Data mining's strong effect ($\beta = 0.667$, $R^2 = 0.445$) explains 44.5% of variance in unreported income detection, reflecting its ability to uncover hidden patterns in large datasets, consistent with global trends (Waziri, 2020). Data analytics' impact on compliance ($\beta = 0.453$, $R^2 = 0.205$) underscores its role in monitoring trends and deterring evasion, aligning with Deterrence Theory (Wells, 2014). Conversely, ratio analysis's insignificance ($\beta = 0.372$, $p = 0.381$, $R^2 = 0.138$) suggests limitations in handling Nigeria's complex evasion schemes, such as transfer pricing, due to its reliance on standardized financial ratios (Ibadin & Embele, 2023). This highlights the need for FIRS to prioritize data-driven tools over traditional methods to address sophisticated fraud, supporting calls for enhanced training and infrastructure (Eke & Ogedegbe, 2024).

CONCLUSION

Based on the findings, the following conclusions are drawn:

1. Data mining is highly effective in detecting unreported income, uncovering complex evasion schemes by identifying hidden patterns (Eke & Ogedegbe, 2024).
2. Data analytics significantly improves taxpayer compliance by enhancing trend monitoring and deterrence, aligning with Deterrence Theory (Wells, 2014).
3. Ratio analysis shows limited impact on detecting irregularities due to its reliance on standardized financial ratios, which struggles with Nigeria's sophisticated evasion tactics like transfer pricing (Ibadin & Embele, 2023).
4. FIRS staff recognize the value of forensic techniques, supporting their integration into tax enforcement.
5. Advanced tools (data mining, data analytics) are critical for modern tax administration, offering robust predictive power for FIRS's anti-evasion efforts.

RECOMMENDATIONS

To enhance tax enforcement, the following recommendations are proposed for FIRS:

1. Expand data mining capabilities through investment in advanced software to strengthen detection of unreported income, given its high impact.
2. Integrate data analytics into compliance strategies to boost taxpayer transparency, leveraging its significant effect.
3. Re-evaluate ratio analysis, optimizing its use as a preliminary screening tool or integrating it with data-driven methods to address its limited impact.
4. Implement targeted training programs on data mining and analytics to enhance staff proficiency.
5. Foster inter-departmental collaboration and data integration to create a unified anti-evasion strategy.
6. Establish robust data governance frameworks to ensure data quality, security, and accessibility for forensic auditing.

Suggestions for Future Research

1. Expand the sample to include FIRS regional offices for broader generalizability.
2. Employ mixed methods, combining surveys with in-depth interviews to explore operational challenges in forensic auditing.
3. Investigate organizational and technological barriers to adopting forensic tools at FIRS.
4. Conduct cost-benefit analyses of forensic auditing technologies to guide resource allocation.

REFERENCES

Adamu, V. W., Ibrahim, A., & Uyagu, D. B. (2025). Effect of forensic accounting asset analysis on tax fraud detection in states' internal revenue services of North Central Nigeria. *International Journal of Innovative Finance and Economics Research*, *13*(2), 317–329. https://www.seahipublications.org/wp-content/uploads/2025/04/IJIFER-J-26-2025.pdf

Adebisi, J. F., & Gbegi, D. O. (2015). Fraud and the Nigerian public sector performance: The need for forensic accounting. *International Journal of Business and Management Invention*, *4*(3), 66–73.

African Tax Administration Forum. (2022). *African tax outlook 2022*. https://www.ataftax.org

Akinyele, F. E., & Yusuf, M. A. (2022). Effectiveness of forensic accounting asset analysis in detecting tax fraud among Nigerian corporations. *Journal of Accounting and Taxation*, *14*(3), 200–215.

Becker, G. S. (1968). Crime and punishment: An economic approach. *Journal of Political Economy*, *76*(2), 169–217. https://doi.org/10.1086/259394

Bhasin, M. L. (2015). Forensic accounting: A new paradigm for niche consulting. *Open Journal of Accounting*, *4*(1), 26–38. https://doi.org/10.4236/ojacct.2015.41004

Crumbley, D. L., Heitger, L. E., & Smith, G. S. (2017). *Forensic and investigative accounting* (8th ed.). Wolters Kluwer.

Dorminey, J., Fleming, A. S., Kranacher, M. J., & Riley, R. A. (2010). Beyond the fraud triangle. *The CPA Journal*, *80*(7), 16–23.

Eke, R. I., & Ogedegbe, O. (2024). Impact of forensic accounting on tax administration in Nigeria. *American Interdisciplinary Journal of Business and Economics*, *11*(4), 1–17. https://doi.org/10.5281/zenodo.13933785

Federal Inland Revenue Service. (2022). *Annual report and statistical bulletin*. https://www.firs.gov.ng

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2019). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage.

Ibadin, P. O., & Embele, K. (2023). The effect of forensic audit services on tax fraud in South-South, Nigeria. *Accounting and Finance Research*, *12*(3), 30–45. https://doi.org/10.5430/afr.v12n3p30

James, S. (2016). Taxation: A fieldwork research approach. *Journal of Economic Studies*, *43*(2), 287–306. https://doi.org/10.1108/JES-07-2014-0134

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Murphy, R. (2019). Tax justice and the future of tax in the global economy. *Critical Perspectives on Accounting*, *63*, Article 102038. https://doi.org/10.1016/j.cpa.2018.10.001

Organisation for Economic Co-operation and Development. (2021). *Revenue statistics in Africa 2021*. OECD Publishing. https://doi.org/10.1787/0db5b3b1-en

Okoye, E. I., & Ezejiofor, R. A. (2021). Forensic accounting as a tool for fraud detection and prevention in the public sector. *International Journal of Academic Research in Business and Social Sciences*, *11*(3), 244–263. https://doi.org/10.6007/IJARBSS/v11-i3/8996

Okoye, E. I., & Gbegi, D. O. (2013). An evaluation of forensic accountants to planning management fraud risk detection procedures. *Global Journal of Management and Business Research*, *13*(1), 75–89.

PwC. (2021). *PwC's global economic crime and fraud survey 2021*. PricewaterhouseCoopers. https://www.pwc.com/gx/en/services/forensics/economic-crime-survey.html

Raza, H., & Murtaza, S. (2021). Role of data analytics in tax fraud detection: A review. *Journal of Accounting and Taxation*, *13*(3), 61–70.

Wang, L., & Yang, Y. (2020). Application of data mining technology in tax audit. *Journal of Intelligent & Fuzzy Systems*, *38*(3), 2889–2895. https://doi.org/10.3233/JIFS-179292

Waziri, A. (2020). Forensic auditing and tax compliance: A comparative study of West African tax systems. *International Journal of Accounting and Taxation*, *8*(1), 21–36. https://doi.org/10.15640/ijat.v8n1a3

Wells, J. T. (2014). *Principles of fraud examination* (4th ed.). Wiley.