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Perceived Contributions of Forensic Data Collection Tools to Electronic Tax Enforcement, Legal Proceedings and Accounting Regulatory Alignment in Nigeria: Evidence From Federal Tax Administration Personnel

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ABSTRACT

The expansion of electronic tax administration has improved the speed and reach of tax services, but it has also created opportunities for the manipulation, concealment, and suppression of digital financial records. This study examines how forensic data collection tools are perceived to contribute to the prevention and detection of electronic tax evasion, the progress of related legal proceedings, and alignment with Nigeria's accounting regulatory framework. A descriptive survey was conducted among 332 Nigeria Revenue Service (NRS) personnel in Abuja, selected purposively from a reported study population of 600 or more. Data were collected through a structured five-point Likert questionnaire administered by hand and online. Face validity was assessed by an academic supervisor, while a 50-person pilot test produced a Cronbach's alpha of 0.879. Descriptive statistics and four multiple-regression models were reported. Respondents expressed agreement that forensic tools support prevention (63.9%), detection (58.7%), faster legal proceedings (62.7%), and more successful legal action (61.1%). In the regulatory-alignment model, the reported fit was $R = 0.972$ and $R^2 = 0.945$, with positive coefficients for forensic tools ($\beta = 0.532$), the accounting regulatory framework ($\beta = 0.442$), and the improved accounting regulatory framework ($\beta = 0.666$), all at $p < 0.001$. However, the source regression tables identify electronic tax evasion (EVAS), rather than successful legal proceedings, as the dependent variable. The results therefore indicate strong associations among the measured perceptions but do not establish actual conviction rates or prove that the model predicts courtroom outcomes. The study highlights the value of integrating forensic capability with clear regulatory procedures, competent expert reporting, and secure evidence handling in Nigeria's digital tax-enforcement system.

Keywords: digital forensics; forensic data collection; electronic tax evasion; legal proceedings; accounting regulatory framework; tax administration; Nigeria

1. INTRODUCTION

The digitisation of tax registration, filing, payment, and reporting has changed the way revenue authorities interact with taxpayers and assess compliance. Electronic platforms make it possible to process larger

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volumes of information, reduce routine administrative delays, and create transaction records that can support more consistent monitoring. At the same time, the concentration of financial and taxpayer information in digital systems creates new opportunities for concealment, unauthorised alteration, data interference, and electronic sales suppression. Software designed to support ordinary accounting and sales functions can be manipulated to hide transactions or understate taxable income, making conventional audit procedures insufficient when the underlying records have been deliberately altered [1,2].

Forensic accounting responds to this challenge by bringing together accounting, auditing, information technology, analytical methods, investigation, and litigation support. Its value lies not simply in identifying an unusual transaction, but in establishing how the transaction occurred, tracing related records, preserving relevant information, and presenting findings in a form that can be independently examined. Contemporary forensic practice may draw on data mining, anomaly detection, digital-device examination, network analysis, database interrogation, document review, and financial statement analysis. These methods allow investigators to move beyond the surface figures in an accounting system and examine the records and relationships that produced them [2,3].

Nigeria's adoption of electronic tax administration has included online registration, electronic filing, tax payment, electronic receipts, and tax clearance services. The Federal Inland Revenue Service (FIRS) introduced the Integrated Tax Administration System and subsequently expanded digital services through TaxPro Max, which was implemented in 2021 to support electronic tax returns and payments. The statutory setting identified in the source study includes the NRS (Establishment) Act and provisions of the Finance Acts 2020 and 2021. These developments provide an administrative basis for technology-enabled tax collection, but the value of electronic platforms depends on reliable data, secure systems, trained personnel, and procedures capable of addressing manipulation or disputes [4,5].

The enforcement problem is therefore both technical and institutional. Digital traces may reveal underreported sales, duplicate transactions, unusual payment patterns, altered accounting entries, or inconsistencies between declared income and other records. Yet an analytic alert is not, by itself, proof of an offence. Investigators must establish the origin and integrity of the data, explain the methods used to obtain and analyse it, document its handling, and provide a defensible interpretation. Legal proceedings also depend on the quality of expert testimony, the clarity of applicable regulatory requirements, and the ability of the court to assess the evidence presented.

Prior research has examined electronic taxation, tax compliance, fraud detection, and forensic accounting, but these subjects are not always brought together in a single empirical assessment. Studies of electronic taxation have considered its relationship with compliance and revenue generation, while forensic accounting research has considered the identification of financial manipulation and fraud [5-8]. Less attention has been given to how the perceived availability of forensic tools relates simultaneously to prevention, detection, legal proceedings, and accounting-regulatory alignment within the Nigerian federal tax-administration environment.

The present study addresses this issue through a survey of NRS personnel based in Abuja. Its central concern is the perceived contribution of forensic data collection tools to the process through which digital irregularities are identified, investigated, and prepared for legal action. The phrase "from analytic alerts to conviction" describes this intended enforcement pathway. It should not be read as evidence that the study analysed court files or verified conviction outcomes; the underlying research relied on questionnaire responses from tax and accounting personnel.

Study objectives

1. To assess the perceived contribution of forensic data collection tools to the prevention of electronic tax evasion in Nigeria.

2. To examine the perceived contribution of forensic data collection tools to the detection of electronic tax-evasion cases.

3. To investigate respondents' assessments of the contribution of forensic data collection tools to legal proceedings against electronic tax evasion.

4. To examine the perceived alignment of forensic data collection tools with the accounting regulatory framework in Nigeria.

2. LITERATURE REVIEW

2.1. Forensic Accounting Data Collection Tools

Forensic data collection tools are the technical and analytical resources used to identify, acquire, examine, and interpret information relevant to suspected financial misconduct. Their application extends beyond conventional financial statement review because they may involve digital devices, network servers, mobile phones, databases, accounting applications, transaction logs, emails, electronic documents, invoices, ledgers, and other records capable of revealing the sequence and context of financial activity. Forensic accountants combine these sources with accounting knowledge and investigative judgement to identify anomalies, reconstruct transactions, and support the preparation of findings for legal or regulatory review [2,3].

The source manuscript groups the tools into five practical categories. Digital forensic software, including EnCase, Forensic Toolkit, X-Ways Forensics, and Autopsy, can assist in examining digital storage and recovering relevant records. Mobile-device tools such as Cellebrite UFED and MSAB XRY are used to examine information held on mobile devices. Network tools, including Wireshark and Network Miner, support the examination of network activity. Database tools, including SQLite Forensics Toolkit and DbVisualizer, assist in interrogating structured records. E-discovery and data-analytics applications, including Relativity, kCura's e-discovery software, and Tableau, support the review, organisation, visualisation, and analysis of large information sets.

These categories are complementary rather than interchangeable. A network tool may identify data transfers or suspicious system activity, while database examination may reveal alterations to transaction records. Mobile-device analysis may provide context about communications or access, and e-discovery tools may assist in organising a large collection of documents for review. Financial analytics can then compare transaction patterns, identify unusual concentrations, examine duplicate or round-number entries, and test whether recorded activity is consistent with the declared tax position. The usefulness of each tool depends on the question being investigated, the quality of the source data, the investigator's competence, and whether the method can be explained and reproduced.

2.2. Electronic Tax Evasion and Digital Tax Administration in Nigeria

Electronic tax evasion involves the deliberate use of electronic systems or digital business processes to conceal taxable activity, understate revenue, inflate deductions, or otherwise reduce an amount of tax legally due. The methods described in the source manuscript include the manipulation of accounting or sales software, suppression of transaction figures, interference with electronic records, and the concealment of information within digital business systems. These practices can be difficult to identify through a conventional audit when the reported figures have been altered before the accounts are reviewed [1,6].

Nigeria's electronic tax services include taxpayer registration, e-stamp duty, electronic payment, electronic receipts, e-filing, and electronic tax-clearance certification. TaxPro Max is described in the source manuscript as a platform that supports the filing of relevant federal tax returns, electronic payments, and the generation of a document identification number. Such systems can improve the accessibility and consistency of tax administration and create digital records that can be analysed for compliance purposes [4,5].

However, the availability of electronic services does not remove the underlying risks. The source manuscript identifies limited computer literacy, database capacity and system-upgrade constraints, cybersecurity threats, high implementation costs, uneven adoption across jurisdictions, unreliable internet connectivity, and unstable electricity supply as challenges affecting electronic tax administration. These limitations can create gaps between the digital records that tax authorities need and the records that are available, complete, or sufficiently secure for investigation. Effective enforcement therefore requires both reliable tax platforms and a forensic capability that can examine irregularities within them.

2.3. Digital Evidence and Legal Proceedings

The evidential value of forensic accounting depends on more than the sophistication of the software used. A defensible investigation requires a clear record of what information was obtained, where it came from, who accessed it, what procedures were applied, and how the findings were derived. The source manuscript emphasises the need for evidence to be sufficient to identify the persons involved, explain the mechanism of the suspected scheme, and establish the financial implications. It also recognises that an incomplete chain of custody or inconclusive documentation can expose evidence to challenge during legal proceedings.

Forensic accountants may contribute to litigation by preparing expert reports, reconstructing financial transactions, explaining technical findings, identifying relevant documentary evidence, and assisting legal practitioners or courts to understand complex accounting matters. Their work is most useful when the report distinguishes observed facts from professional interpretation and makes the analytical process transparent. A court must be able to assess the reliability of the material and the reasoning used to reach the conclusions; the mere use of a recognised tool does not establish that every output is accurate or legally sufficient [3,7].

The pathway from an analytic alert to a legal outcome can therefore be understood as a sequence of linked activities: access to relevant records; lawful acquisition and preservation; forensic examination; reconciliation with accounting and tax information; preparation of a clear report; and legal evaluation of the evidence. Failures at any stage may weaken the value of the investigation. In particular, a statistical anomaly is a lead for further investigation, not a substitute for corroboration, legal analysis, or proof of the elements of an offence.

2.4. Accounting Regulatory Framework and Forensic Alignment

An accounting regulatory framework provides the standards, rules, and institutional procedures that guide the preparation, presentation, examination, and reporting of financial information. Within tax administration, a coherent framework helps establish which records should be maintained, how taxable transactions are to be classified, and what information a taxpayer is required to report. Forensic tools can support compliance by comparing records against these requirements, identifying departures from expected patterns, and documenting the financial implications of suspected non-compliance.

The source study distinguishes between the Accounting Regulatory Framework (ARFW) and the Improved Accounting Regulatory Framework (IARFW). IARFW is defined in the manuscript as an improved framework that incorporates digital evidence and forensic tools to strengthen transparency and compliance. It is therefore not an abbreviation for "international accounting regulatory framework," nor is it defined in the

source as an internal company framework. This distinction is retained throughout the present article to preserve the study's original variable definitions.

The Nigerian statutory context discussed in the manuscript includes the NRS (Establishment) Act, Section 25 of the Finance Act 2020, and amendments associated with the Finance Act 2021. The manuscript links these provisions to the use of technology in tax administration and describes TaxPro Max as an operational platform for electronic filing and payment. For the purposes of this survey, however, regulatory alignment was measured through respondents' perceptions; the study did not conduct a clause-by-clause legal audit of tax or accounting legislation [8-11].

2.5. Empirical Evidence and the Research Gap

Existing studies cited in the source manuscript point to the growing role of forensic accounting and information technology in fraud detection, tax assessment, and electronic tax compliance. Research on information technology and tax assessment in Nigeria highlights the importance of digital systems in strengthening administrative processes, while studies of electronic taxation have examined the relationship between online filing, payment facilities, and compliance [4-6]. Work on forensic accounting has also emphasised the value of investigative expertise in identifying tax fraud and financial manipulation [3,7,12].

The literature nevertheless leaves room for a more integrated examination of forensic tool use, legal proceedings, and the accounting regulatory framework. The present study contributes a Nigerian FIRS-based survey that considers these dimensions together. Its contribution is primarily descriptive and perceptual: it documents how personnel involved in tax administration, auditing, forensic accounting, legal support, and information technology assess the contribution of forensic tools. It does not independently verify the number of investigations completed, cases filed, evidence admitted, or convictions secured.

3. THEORETICAL FOUNDATIONS

The manuscript adopts three complementary perspectives to explain why forensic technologies may be taken up by tax authorities, how technological change can alter investigative practice, and why the perceived risk of detection can influence taxpayer behaviour. Together, these perspectives provide a basis for interpreting the relationships among technology use, tax enforcement, and regulatory alignment.

3.1. Technology Acceptance Model

The Technology Acceptance Model (TAM) explains the adoption of information technology through users' perceptions of usefulness and ease of use. Perceived usefulness concerns the extent to which a system is expected to improve job performance, while perceived ease of use concerns the effort required to operate it [16]. In a tax-enforcement setting, forensic software is more likely to be used consistently when investigators consider it helpful for detecting concealed transactions and when they have the knowledge, training, and organisational support needed to operate it. TAM therefore helps explain why the availability of advanced tools does not automatically translate into effective forensic practice.

3.2. Disruptive Innovation Theory

Disruptive Innovation Theory provides a lens for understanding how new technologies can alter established practices and create different ways of delivering a service or performing a task [17]. In forensic accounting, digital acquisition, automated analytics, and network or database examination can extend investigations beyond the limitations of manual document review. These technologies may change the scale and speed of

analysis, but their practical value depends on institutional readiness, the suitability of the tools, and the capacity to integrate their outputs into accepted accounting and legal procedures.

3.3. Economics of Crime Model

The economics of crime approach to tax compliance holds that individuals may weigh the financial gains from evasion against the probability of detection and the expected penalties. The classic tax-evasion model developed by Allingham and Sandmo formalises this decision as a choice under uncertainty [18]. Forensic tools may influence this calculation by increasing the likelihood that concealed transactions will be discovered and by improving the quality of information available to investigators. The deterrent effect, however, depends on more than detection technology: enforcement must be credible, legal procedures must operate fairly, and sanctions must be applied consistently.

3.4. Theoretical Integration

TAM explains the adoption and routine use of forensic tools; Disruptive Innovation Theory explains how those tools can transform investigative processes; and the economics of crime model explains why a credible increase in detection risk may affect tax-compliance decisions. Their combined implication is that forensic readiness requires a fit among technology, people, procedures, and institutions. Tools can generate alerts, but the movement from an alert to an enforceable finding depends on reliable acquisition, regulatory interpretation, and legal evaluation.

Figure 1 illustrates a sequential six-stage pathway linking digital tax and accounting records to forensic acquisition, regulatory reconciliation, evidence preservation, expert reporting, and judicial determination. It also highlights seven enabling conditions that support the reliability, integrity, admissibility, and effective evaluation of forensic evidence throughout the process.

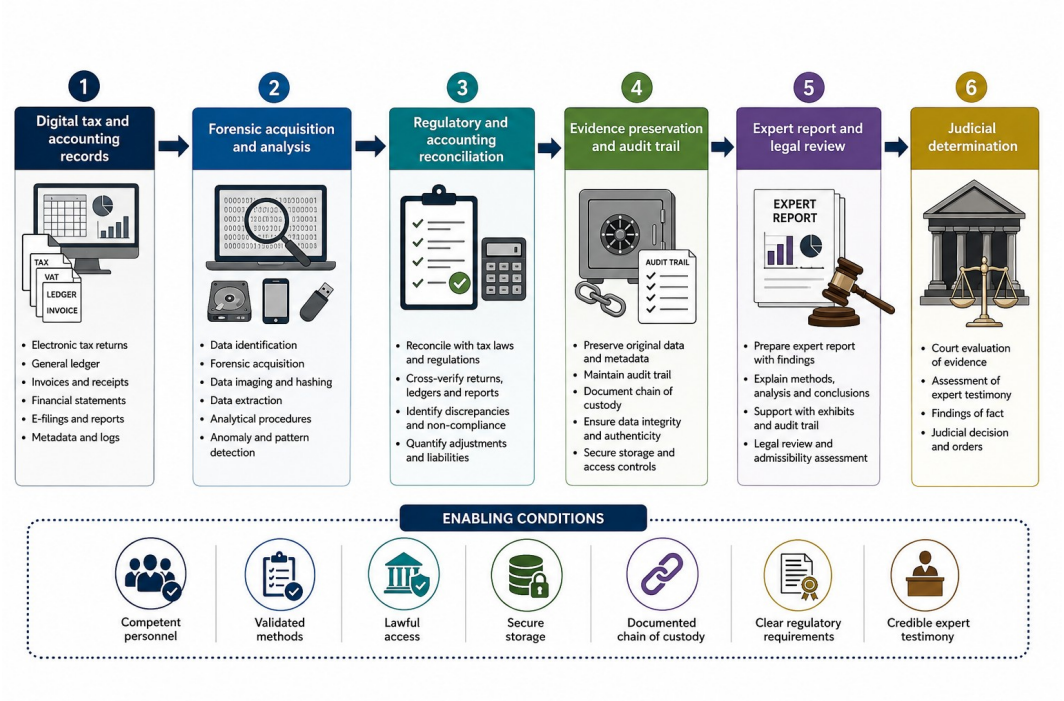


Figure 1. Conceptual Pathway from Digital Tax and Accounting Records to Judicial Determination [2-4,12, 22-24].

The numbered panels (1–6) represent the successive stages of the forensic process, while the lower section presents the seven enabling conditions supporting the process. Abbreviations: VAT, value-added tax; e-filings, electronic tax filings.

4. MATERIALS AND METHODS

4.1. Research Design and Study Setting

The study used a descriptive survey design to obtain the views of personnel involved in federal tax assessment, collection, auditing, forensic accounting, legal support, and information technology. Although the source manuscript describes the design as both cross-sectional and longitudinal, it reports a single questionnaire exercise and does not describe repeated observations over time. The present article therefore treats the design as cross-sectional. The study setting was Abuja, Nigeria, where the headquarters of the Ngeria Revenue Service is located.

4.2. Population, Sample, and Sampling Procedure

The target population was reported as 600 or more NRS-related personnel in Abuja with responsibilities connected to tax assessment, collection, planning, disputes, auditing, forensic investigation, or litigation. A total of 332 questionnaires were administered and 332 usable responses were recorded, giving the 100% response rate reported in the source manuscript. Respondents were selected purposively because the study required participants with direct experience or professional responsibility in tax administration and related investigative functions. The manuscript reports that Cochran's sample-size approach informed the target; however, the written calculation should be checked against the original data and population estimate before formal submission. Accordingly, the present article reports the achieved sample of 332 without restating an unverified confidence interval or margin of error [13].

4.3. Research Instrument, Validity, and Reliability

Data were collected with a structured questionnaire administered by hand and through Google Forms. Section A requested demographic and occupational information, including gender, age, work experience, qualification, employment role, and organisational status. Section B contained items linked to the study objectives and hypotheses. The items used a five-point Likert response scale ranging from strongly disagree to strongly agree. The instrument was reviewed for face validity by an academic supervisor in the Department of Accountancy, University of Nigeria, Enugu Campus. A pilot administration involving 50 copies of the questionnaire produced a Cronbach's alpha of 0.879, which indicates good internal consistency for the instrument as reported in the manuscript [14,15]. The source does not provide separate reliability coefficients for each construct.

4.4. Study Variables and Model Specification

The source manuscript defines electronic tax evasion (EVAS) as the dependent variable in the reported regression outputs. The explanatory variables differ across the four objective-specific models. FTVP represents forensic tools for e-tax-evasion prevention; FETVP represents improved forensic tools for prevention; FOTLS represents forensic tools generally; ETVC and EETVC represent the efficiency and efficacy of forensic tools in detecting e-tax-evasion cases; BLEGP represents legal proceedings; SLEGP represents successful legal proceedings; ARFW represents the accounting regulatory framework; and IARFW represents an improved accounting regulatory framework.

The four reported specifications can be represented in general form as:

$$EVAS_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i$$

For Model 1, the predictors were FTVP, FETVP, and FOTLS. For Model 2, they were ETVC, EETVC, and FOTLS. For Model 3, they were FOTLS, BLEGP, and SLEGP. For Model 4, they were FOTLS, ARFW, and IARFW. This

description follows the dependent-variable notes attached to the statistical tables in the source manuscript. It is important because the model labels and accompanying narrative sometimes describe prevention, legal proceedings, or regulatory alignment as the outcome, whereas the regression-table footnotes consistently identify EVAS as the dependent variable. The estimates are therefore reported as associations with the EVAS score, not as direct estimates of conviction probability.

4.5. Data Analysis and Reporting

The study used descriptive summaries, frequency distributions, means, standard deviations, and multiple-regression analysis to examine the questionnaire responses. Statistical significance was assessed at the 5% level. The regression tables report the model correlation coefficient, coefficient of determination, adjusted coefficient of determination, standard error of the estimate, Durbin–Watson statistic, ANOVA F-statistic, and unstandardised and standardised regression coefficients. Values reported as .000 in the original output are presented here as $p < 0.001$. Where the manuscript's printed means or test statistics conflicted with the underlying frequency or ANOVA figures, the discrepancy is identified rather than concealed.

4.6. Ethical and Confidentiality Considerations

The questionnaire introduction in the source manuscript states that responses would remain confidential and would be used solely for research purposes. The manuscript does not provide an institutional ethics approval number or a formal exemption statement. This information should be added by the author before submission, together with confirmation of the consent process and any applicable institutional requirements.

5. RESULTS

5.1. Respondent Characteristics

All 332 questionnaires were reported as completed and returned. The sample comprised 172 men (51.8%) and 160 women (48.2%). The largest age group was 30–39 years (34.9%), followed by 40–49 years (26.8%). In terms of professional experience, 35.5% reported 10–15 years and 33.4% reported fewer than 10 years. Professional qualifications were the most frequently reported qualification category (54.2%), while 36.4% held postgraduate degrees. Forensic accountants made up 32.8% of respondents, auditors 27.1%, tax officials 19.6%, tax counsel 12.0%, and information-technology officials 8.4%.

Table 1 presents the demographic and occupational characteristics of the 332 respondents, including their gender, age, work experience, educational qualifications, employment roles, and organisational status. It supports Section 5.1 by providing the background information needed to understand the composition of the study population.

Table 1. ***Demographic and occupational profile of respondents (n = 332)***

Variable	Category	Frequency (n)	Percent (%)
Gender	Male	172	51.8
	Female	160	48.2
Age (years)	Below 30	70	21.1
	30–39	116	34.9
	40–49	89	26.8

Variable	Category	Frequency (n)	Percent (%)
	50–59	57	17.2
Work experience	Below 10 years	111	33.4
	10–15 years	118	35.5
	16–20 years	68	20.5
	21–25 years	22	6.6
	26 years and above	13	3.9
Qualification	Professional qualification	180	54.2
	HND/BSc	31	9.3
	Postgraduate degree	121	36.4
Employment role	Forensic accountant	109	32.8
	Auditor	90	27.1
	Tax official	65	19.6
	Tax counsel	40	12.0
	Information-technology official	28	8.4
Organisational status	Junior staff	198	59.6
	Senior staff	102	30.7
	Contract staff	32	9.6

Values are presented as frequencies and percentages of the 332 respondents, with categories covering demographic, educational, professional, and organisational characteristics.

Abbreviations: n = number of respondents; % = percentage; HND = Higher National Diploma; BSc = Bachelor of Science.

5.2. Forensic Tools and Perceived Drivers of E-Tax Evasion

The responses identified five broad tool categories. Digital forensic software and network forensic tools each accounted for approximately one-fifth of the reported selections, followed closely by mobile-device and database forensic tools. E-discovery and data-analytics tools formed the remaining category. Respondents also identified dissatisfaction with government spending and financial hardship as the most frequently selected reasons associated with tax evasion, followed by regulatory complexity.

Table 2 summarises the five categories of forensic tools identified by respondents alongside their perceptions of the major reasons associated with electronic tax evasion. It relates to Section 5.2 by showing the distribution of respondents' selections across the identified tool categories and perceived drivers.

Table 2. ***Forensic tool categories and perceived reasons for tax evasion***

Forensic tool category	n	%	Perceived reason	n	%
Digital forensic software	68	20.5	Financial hardship	88	26.5
Mobile-device forensic tools	66	19.9	Belief that detection is unlikely	37	11.1
Network forensic tools	68	20.5	Complexity of tax regulations	59	17.8
Database forensic tools	66	19.9	Dissatisfaction with government spending	100	30.1
E-discovery and data analytics	64	19.3	Other reasons	48	14.5

Values represent the number and percentage of respondents selecting each forensic tool category and perceived reason associated with electronic tax evasion.

Abbreviations: n = number of respondents; % = percentage.

5.3. Perceived Contribution to Prevention, Detection, and Legal Proceedings

A majority of respondents agreed or strongly agreed that forensic tools contribute to the prevention of e-tax evasion (212 of 332; 63.9%). A larger proportion (232; 69.9%) agreed that the tools improve the effectiveness of preventive activity. For case detection, 195 respondents (58.7%) agreed or strongly agreed that forensic tools contribute to identifying e-tax-evasion cases, while 216 (65.1%) considered that the tools improve detection efficiency.

Perceptions were also positive in relation to legal proceedings. A combined 208 respondents (62.7%) agreed or strongly agreed that forensic tools expedite legal proceedings against e-tax evaders. A further 203 respondents (61.1%) agreed or strongly agreed that the tools lead to more successful legal actions. These results reflect the views of the sampled personnel; they do not represent court-record counts or independently established conviction rates.

Table 3 presents respondents' levels of agreement with statements concerning the contributions of forensic tools to preventing and detecting electronic tax evasion, improving detection efficiency, and supporting legal proceedings. It supports Section 5.3 by showing the distribution of responses and the corresponding descriptive statistics for each study statement.

Table 3. ***Distribution of responses to key study statements***

Survey statement	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)	Mean ± SD
Tools contribute to preventing e-tax evasion	54 (16.3)	48 (14.5)	18 (5.4)	110 (33.1)	102 (30.7)	3.476 ± 1.461
Tools improve prevention effectiveness	40 (12.0)	49 (14.8)	11 (3.3)	103 (31.0)	129 (38.9)	3.699 ± 1.418
Tools contribute to detecting e-tax-evasion cases	74 (22.3)	48 (14.5)	15 (4.5)	98 (29.5)	97 (29.2)	3.289 ± 1.557
Tools improve detection efficiency	59 (17.8)	40 (12.0)	17 (5.1)	112 (33.7)	104 (31.3)	3.488 ± 1.480
Tools expedite legal proceedings	69 (20.8)	45 (13.6)	10 (3.0)	98 (29.5)	110 (33.1)	3.407 ± 1.559
Tools lead to more successful legal actions	63 (19.0)	61 (18.4)	5 (1.5)	100 (30.1)	103 (31.0)	3.358 ± 1.537

Values are expressed as response frequencies, percentages, and mean scores with standard deviations, based on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Abbreviations: n = number of respondents; % = percentage; SD = standard deviation; Mean = average response score.

5.4. Regression Model Fit

All four reported regression models were statistically significant at $p < 0.001$. The reported coefficients of determination ranged from 0.945 to 0.983, indicating that the specified predictors accounted for a large proportion of the variation in the EVAS score as it was labelled in the source tables. The strongest overall fit was reported for the detection model ($R^2 = 0.983$), followed by the legal-proceedings model ($R^2 = 0.976$), the prevention model ($R^2 = 0.969$), and the regulatory-alignment model ($R^2 = 0.945$). The Durbin–Watson statistics ranged from 1.560 to 2.388.

Table 4 summarises the statistical fit of the four regression models examining the relationships between forensic tools, prevention, detection, legal proceedings, and accounting regulatory alignment. It relates to Section 5.4 by presenting the principal model-fit statistics used to assess the explanatory strength and overall significance of each regression model.

Table 4. ***Summary of the Four Regression Models Reported in the Study***

Model focus	R	R^2	Adj. R^2	Std. error	Durbin–Watson	F (3, 328)
1. Prevention	0.984	0.969	0.969	0.26798	1.560	3,407.56*

Model focus	R	R^2	Adj. R^2	Std. error	Durbin–Watson	F (3, 328)
2. Detection	0.991	0.983	0.982	0.20020	2.370	6,192.214
3. Legal proceedings	0.988	0.976	0.976	0.23443	2.388	4,486.332
4. Regulatory alignment	0.972	0.945	0.945	0.35588	2.156	1,884.870

The table presents the correlation coefficients, coefficients of determination, adjusted coefficients of determination, standard errors, Durbin–Watson statistics, and F statistics for the four regression models. Abbreviations: R = multiple correlation coefficient; R^2 = coefficient of determination; Adj. R^2 = adjusted coefficient of determination; Std. error = standard error of the estimate; F = F statistic; EVAS = electronic tax evasion; p = probability value.

5.5. Regression Coefficients

The coefficient estimates were positive and statistically significant across the four reported models. In the prevention model, FTVP had the largest standardised coefficient (β = 0.852), followed by FOTLS (β = 0.242) and FETVP (β = 0.099). In the detection model, ETVC (β = 0.569) and EETVC (β = 0.422) were the strongest reported predictors, while FOTLS also had a positive coefficient (β = 0.176). In the legal-proceedings model, BLEGP had β = 0.883 and SLEGP had β = 0.293, while FOTLS had β = 0.114. In the regulatory-alignment model, IARFW had the largest standardised coefficient (β = 0.666), followed by FOTLS (β = 0.532) and ARFW (β = 0.442).

Table 5 presents the regression coefficients and associated statistical measures for the predictors included in the four study models, showing the direction, magnitude, and statistical significance of their relationships with the dependent variable. It supports Section 5.5 by identifying the relative contributions of the explanatory variables across the prevention, detection, legal proceedings, and regulatory alignment models.

Table 5. ***Regression coefficient estimates reported for the four study models***

Model	Predictor	B	SE	Std. β	t	p
1. Prevention	Constant	0.691	0.105	—	6.555	<0.001
	FTVP	0.882	0.039	0.852	22.768	<0.001
	FETVP	0.106	0.036	0.099	2.965	0.003
	FOTLS	0.260	0.027	0.242	9.653	<0.001
2. Detection	Constant	0.907	0.099	—	9.209	<0.001
	ETVC	0.553	0.031	0.569	17.589	<0.001
	EETVC	0.431	0.026	0.422	16.445	<0.001
	FOTLS	0.575	0.109	0.176	5.285	<0.001

Model	Predictor	B	SE	Std. β	t	p
3. Legal proceedings	Constant	0.100	0.034	—	2.990	0.003
	FOTLS	0.122	0.027	0.114	4.511	<0.001
	BLEGP	0.857	0.023	0.883	37.061	<0.001
	SLEGP	0.921	0.107	0.293	8.631	<0.001
4. Regulatory alignment	Constant	0.470	0.057	—	8.292	<0.001
	FOTLS	0.562	0.039	0.532	14.506	<0.001
	ARFW	0.672	0.056	0.442	12.067	<0.001
	IARFW	0.672	0.077	0.666	8.734	<0.001

The table presents the unstandardised and standardised regression coefficients, standard errors, t statistics, and corresponding significance values for the explanatory variables in the four regression models. Abbreviations: B = unstandardised regression coefficient; SE = standard error; Std. β = standardised regression coefficient; t = t statistic; p = probability value; FTVP = forensic tools for electronic tax evasion prevention; FETVP = improved forensic tools for prevention; FOTLS = forensic tools; ETVC = efficiency of forensic tools in detecting electronic tax evasion cases; EETVC = efficacy of forensic tools in detecting electronic tax evasion cases; BLEGP = legal proceedings; SLEGP = successful legal proceedings; ARFW = accounting regulatory framework; IARFW = improved accounting regulatory framework. The dash (—) indicates that a standardised coefficient is not reported for the constant.

5.6. Interpretive Note on the Model Specification

The final model is central to the article's focus on forensic tools and regulatory alignment. Its reported R^2 of 0.945 indicates that the three predictors; FOTLS, ARFW, and IARFW jointly account for 94.5% of the variation in the EVAS score specified in the statistical output. The standardised coefficients are positive and statistically significant, with IARFW recording the largest coefficient. These results support the existence of strong statistical associations among the measured constructs. They do not, however, show that the model explains 94.5% of the variation in successful legal outcomes, because SLEGP is not identified as the dependent variable in the source regression table.

A similar issue applies to the legal-proceedings model. Although its predictors include FOTLS, BLEGP, and SLEGP, the table footnote again identifies EVAS as the dependent variable. The model can therefore be reported as the source study specified it, but its coefficients cannot be interpreted as direct estimates of the effect of forensic tools on the probability of a successful prosecution. A revised analysis using a clearly defined legal-proceedings or conviction outcome would be required to make that inference.

6. DISCUSSION

6.1. Forensic Capability and the Prevention of E-Tax Evasion

The descriptive findings indicate that respondents generally regard forensic tools as useful in preventing electronic tax evasion. Almost two-thirds agreed that the tools contribute to prevention, and approximately seven in ten considered that they improve preventive effectiveness. The prevention model also reported positive coefficients for FTVP, FETVP, and FOTLS. The strongest standardised coefficient was associated with tools specifically directed at prevention, suggesting that respondents placed particular value on the practical application of forensic methods to risk identification and compliance activity.

The range of tools reported in the study is consistent with the nature of digital tax investigations. Digital forensic software can assist in examining stored data; mobile and network tools can extend the investigation to devices and communication activity; database tools can identify irregularities within structured transaction records; and e-discovery or analytics platforms can help investigators review large volumes of information. Their value is greatest when they are selected according to the investigation, applied by trained personnel, and used alongside accounting judgement rather than treated as automated proof.

6.2. Detection and the Quality of Investigative Leads

The detection findings also point to a positive perception of forensic capabilities. More than half of the respondents agreed that forensic tools contribute to the detection of e-tax-evasion cases, and 65.1% agreed that they improve detection efficiency. The detection model reported significant positive coefficients for both efficiency and efficacy constructs. This is consistent with the role of data analytics in identifying anomalies that may not be visible through manual inspection or routine financial statement review [2,3].

Nevertheless, the detection of an anomaly should be treated as the beginning of an investigative process. A statistical pattern may have a legitimate explanation, and an unusual transaction does not on its own demonstrate fraudulent intent. Investigators must verify the underlying records, establish the business context, consider alternative explanations, and document the basis for any adverse conclusion. This distinction is important in tax administration, where enforcement action must be proportionate and supported by evidence that can withstand scrutiny.

6.3. Legal Proceedings: From Digital Findings to Evidentiary Support

Respondents expressed a favourable view of the contribution of forensic tools to legal proceedings: 62.7% agreed that the tools expedite legal action, while 61.1% agreed that they lead to more successful legal action. These responses suggest that practitioners see a connection between technical investigation and the ability to prepare cases for legal review. They are also consistent with the source manuscript's emphasis on expert reporting, transaction reconstruction, investigation, and the documentation of evidence.

The regression output requires a more restrained interpretation. The legal-proceedings model produces significant positive coefficients for FOTLS, BLEGP, and SLEGP, but its statistical table identifies EVAS as the dependent variable. Consequently, it does not establish that the predictors cause more successful proceedings, nor does it quantify the probability of conviction. The descriptive results provide evidence of practitioner perceptions; the model output, as currently specified, provides associations with the EVAS score. This distinction should remain explicit in any policy or legal conclusion drawn from the study.

For practice, the implication is that forensic tools should be embedded in an evidence-management process. Investigators need to record the source of data, authorisation for access, acquisition method, time and date

of collection, storage location, persons who handled the material, analytical steps, and any transformations or exclusions. Reports should identify the tool and version used, explain the method, disclose limitations, and separate raw observations from expert interpretation. This documentation improves transparency and makes the result easier for legal practitioners and courts to assess.

6.4. Accounting Regulatory Alignment

The regulatory-alignment model reported a high R^2 of 0.945 and positive, statistically significant coefficients for FOTLS, ARFW, and IARFW. Of these, IARFW had the highest standardised coefficient (β = 0.666), followed by FOTLS (β = 0.532) and ARFW (β = 0.442). The pattern is consistent with the study's proposition that the usefulness of forensic data collection tools depends on their alignment with an accounting framework capable of recognising, preserving, and evaluating digital records.

The term IARFW is used in the source manuscript to mean an improved accounting regulatory framework that incorporates digital evidence and forensic tools. Such an approach would connect accounting procedures with the practical requirements of digital investigation, including consistent record retention, access controls, audit trails, secure storage, and the ability to reconcile electronic transactions with tax returns. However, the survey does not establish which specific regulatory provisions were complied with by each respondent or organisation. The coefficients should therefore be understood as associations among respondent-rated constructs, not as evidence that a specific statute or accounting standard has been fully implemented.

6.5. An Integrated Interpretation

Taken together, the findings support an integrated view of forensic tax enforcement. Technology provides the capacity to locate and examine digital records; accounting procedures provide a basis for interpreting those records; regulatory requirements define the information and conduct that must be assessed; and legal processes determine whether the resulting evidence is sufficient to support action. A weakness in any one of these components can interrupt the pathway from an analytic alert to a defensible legal outcome.

The three theoretical perspectives help explain this relationship. TAM draws attention to the importance of usefulness, ease of use, training, and organisational support in the adoption of forensic tools. Disruptive Innovation Theory highlights the way digital methods can expand investigative capacity beyond conventional audit procedures. The economics of crime model emphasises the potential deterrent value of a credible detection and enforcement system. None of these perspectives implies that technology alone guarantees compliance or conviction; rather, they point to the need for coordinated technical, organisational, regulatory, and legal capacity.

7. MANAGERIAL IMPLICATIONS

For FIRS and other tax-enforcement managers, the findings support treating forensic readiness as a core operational capability rather than an occasional specialist service. Investment should cover appropriate digital forensic, mobile-device, network, database, and analytics tools, but acquisition should be matched with defined investigative needs, secure infrastructure, software maintenance, and staff competence. Procurement decisions should consider whether the tools are suitable for the data sources encountered, whether their results can be reproduced, and whether the methods can be explained during legal proceedings.

Managers should establish standard operating procedures for the identification, preservation, acquisition, examination, and reporting of electronic evidence. Each investigation should maintain a documented audit

trail, restrict access to authorised personnel, preserve original data where possible, and record the steps taken to generate working copies and analytical outputs. The use of independent review or quality assurance for significant findings can help identify errors before a matter proceeds to legal action.

Training should extend beyond software operation. Forensic accountants, tax auditors, tax counsel, and information-technology officers need a shared understanding of how accounting records are generated, how digital systems can be manipulated, how evidence should be preserved, and how expert findings should be communicated. Joint case reviews and interdisciplinary training can help bridge gaps between investigators, accountants, legal practitioners, and technical specialists.

8. POLICY IMPLICATIONS

At policy level, the study points to the importance of aligning technology-enabled tax administration with clear accounting and evidentiary procedures. Regulations and administrative guidance should specify the responsibilities of tax officers and forensic personnel when digital records are collected, stored, analysed, and disclosed. Guidance should also address access authorisation, confidentiality, retention, quality assurance, and the documentation required when technical findings are presented in a dispute or prosecution.

The statutory framework identified in the source manuscript, including the NRS (Establishment) Act and the Finance Acts 2020 and 2021, should be considered alongside operational rules and professional standards relevant to digital tax administration. The policy objective should be to ensure that statutory authority, accounting requirements, system controls, and forensic procedures work together. This article does not provide a legal opinion on the interpretation or current status of those enactments; a formal statutory review should be undertaken before any legislative recommendation is advanced.

Capacity-building should include specialised training for tax investigators, prosecutors, judicial officers, and expert witnesses. Courts and legal practitioners need sufficient familiarity with digital evidence processes to assess the reliability of the information presented without assuming that a forensic software output is inherently conclusive. Clear procedures for expert reports and technical testimony can improve the communication of complex financial evidence and reduce avoidable disputes over how records were obtained or interpreted.

Finally, inter-agency collaboration should support lawful information sharing, secure exchange of relevant records, and coordination between tax authorities, law-enforcement agencies, financial institutions, and other competent bodies. Such cooperation should be accompanied by safeguards for taxpayer confidentiality, personal information, and due process. Enforcement credibility is strengthened when technology is used consistently, transparently, and within the limits of the law.

9. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Several limitations should guide interpretation of the findings. First, the study relied on self-reported views from 332 personnel associated with NRS in Abuja. The findings cannot automatically be generalised to all federal and state tax authorities, private-sector auditors, or taxpayers across Nigeria. Second, the cross-sectional questionnaire captures perceptions at one period and does not establish temporal order or causal effects. Third, the study did not analyse actual investigation files, prosecution records, judgments, evidence-admissibility decisions, or conviction data. The title's reference to conviction therefore expresses the intended enforcement pathway rather than a measured judicial outcome.

Fourth, the regression tables identify EVAS as the dependent variable across all four models, including the models labelled as legal proceedings and regulatory alignment. The source narrative sometimes describes the same constructs as outcomes. The direction of the EVAS scale and the item-level coding rules are not fully documented in the manuscript. The positive coefficients should not be translated into a reduction in the actual incidence of tax evasion until the construct coding and model specification have been verified. A future analysis should specify separate dependent variables for prevention, detection, legal proceedings, and regulatory alignment where these are the intended outcomes, and should test the measurement model before estimating their relationships.

Fifth, some descriptive values in the source manuscript are inconsistent with their response frequencies. For the legal-proceedings items, the printed means do not agree with the underlying counts; the means and standard deviations shown in Table 3 were recalculated from the counts using the stated five-point scale. The Model 1 F-statistic also differs between the source ANOVA table and narrative; the value shown in Table 4 is recalculated from the reported sums of squares and degrees of freedom. The original dataset and statistical output should be checked before final submission. The sample-size calculation should also be verified because the written Cochran calculation in the source manuscript is not fully consistent with the stated formula and population assumptions.

Future studies should use a larger and more geographically diverse sample and combine survey evidence with administrative and judicial records. Researchers could examine the number of forensic alerts investigated, cases referred for prosecution, evidentiary objections, cases concluded, and convictions or acquittals. Such data would make it possible to test whether tool capability, evidence-handling quality, expert testimony, and regulatory compliance are associated with measurable case outcomes. Longitudinal and mixed-method designs could also clarify how changes in technology, staffing, and legal procedures affect enforcement performance over time.

10. CONCLUSION

This study examined the perceived role of forensic data collection tools in preventing and detecting electronic tax evasion, supporting legal proceedings, and aligning with the accounting regulatory framework in Nigeria. The 332 respondents generally viewed forensic tools as useful across these areas. The reported regression models also produced positive and statistically significant coefficients, including a strong association between forensic tools, the accounting regulatory framework, the improved accounting regulatory framework, and the EVAS score specified in the source output.

The principal implication is that forensic technology is most valuable when it operates within a coherent system of accounting rules, trained personnel, secure evidence handling, and legally defensible reporting. Digital tools can help investigators identify suspicious activity and organise complex records, but the movement from an analytic alert to a legal outcome requires corroboration, transparent methods, proper preservation, competent expert testimony, and judicial evaluation. The evidence presented here supports the importance of that integrated approach, while the limitations of the source model prevent a claim that the reported R^2 of 0.945 directly predicts successful legal proceedings or convictions.

For Nigeria's tax-enforcement institutions, the way forward lies in strengthening forensic readiness, clarifying regulatory procedures, investing in professional capacity, and linking future evaluations to actual investigation and court records. With these improvements, forensic analytics can become a more dependable part of a fair, transparent, and effective tax-administration system.

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13. CONFLICT OF INTEREST STATEMENT

The author declares that there are no financial or personal relationships that could have influenced the conduct, interpretation, or presentation of this study. The author confirms that the research was undertaken independently and without any competing interests.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study were obtained from questionnaire responses collected during the research and are not publicly available in a repository. Access to appropriately de-identified data may be considered upon reasonable request to the corresponding author, subject to participant confidentiality and applicable ethical requirements.

AUTHOR CONTRIBUTIONS

Isaiah John Otseje led the conceptualisation, study design, methodology, investigation, data collection, formal analysis, interpretation, and initial manuscript preparation, while **Ezeani Chukwudi Chukwugaeme**, **Ikenna Ogochukwu Eunice**, **Ugah Catherine and Onyinye**, **Ugwu Peace Chinenyenwa** contributed to the scholarly development, critical review, revision, and refinement of the manuscript. All authors participated in reviewing the manuscript and approved the final version for submission.

AI USAGE DISCLOSURE

A generative AI language tool was used to assist with restructuring and language refinement of this article. The author remains responsible for verifying the underlying data, statistical outputs, references, legal descriptions, interpretations, and final manuscript.

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