

Forensic Accounting Techniques And Fraud Deterrence In Public Tertiary Institutions: Evidence From Federal University, Lafia

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Abstract

This study investigated the effect of forensic accounting techniques on fraud deterrence in public tertiary institutions, using Federal University, Lafia (FU Lafia) as a case study. Employing a survey research design, primary data were collected from 230 purposively selected non-academic staff in the bursary department through structured questionnaires. The study examined the application and perceived effectiveness of asset tracing and recovery, expert witnessing, and whistleblowing/anonymous reporting in preventing fraudulent activities. Data were analysed using descriptive statistics, structural equation modeling (SEM), confirmatory factor analysis (CFA), and multicollinearity diagnostics, with model fit assessed via CFI, TLI, RMSEA, and SRMR indices. Reliability tests using Cronbach's Alpha indicated acceptable internal consistency for all constructs. The findings reveal that asset tracing and recovery and whistleblowing mechanisms exhibit negative and statistically insignificant effects on fraud deterrence, suggesting inadequate implementation, low staff engagement, or institutional limitations. Expert witnessing showed a negative but statistically significant effect, indicating procedural gaps or delays in leveraging expert interventions effectively. Overall, the results highlight that while forensic accounting techniques have conceptual potential to enhance fraud prevention, their practical effectiveness is constrained by institutional culture, enforcement gaps, and insufficient procedural integration. The study concludes that strengthening operational frameworks, formalizing expert-witness procedures, and interviews and interrogation and whistleblowing policies are critical to maximizing the preventive impact of forensic accounting. These insights confirms the need for Nigerian public universities to adopt structured, policy-driven approaches and build capacity to enhance financial accountability, transparency, and governance.

Keywords: Forensic Accounting; Fraud Deterrence; Asset Tracing; Expert Witness; Whistleblowing.

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INTRODUCTION

Fraud persists as a pervasive governance challenge within public sector entities globally, continually eroding institutional transparency, accountability, and efficient stewardship of public resources. Public tertiary institutions in Nigeria are equally susceptible to this dilemma, as manifestations of financial malfeasance have evolved in complexity, increasingly circumventing conventional internal control systems and statutory oversight frameworks. Given that universities and higher education agencies administer substantial financial allocations derived from government subventions, internally generated revenue streams, research grants, and donor funding, they remain prime targets for diverse forms of financial manipulation. Empirical investigations and audit reports consistently document incidences of embezzlement, procurement-related collusion, payroll falsification, and financial reporting irregularities, all of which signal profound deficiencies in institutional governance structures and internal accountability mechanisms.

In response to these vulnerabilities, tertiary institutions across North-Central Nigeria—including federal and state universities such as the University of Abuja—are progressively adopting forensic accounting methodologies as a strategic fraud deterrence framework. Unlike traditional audit procedures that are predominantly compliance-oriented and retrospective in nature, forensic accounting integrates investigative techniques, analytical diagnostics, and litigation-support expertise capable of unveiling concealed irregularities and mitigating financial crime. Contemporary techniques such as digital forensic analytics, transactional review mechanisms, documentation authentication, structured interview methodologies, and behavioural financial profiling are increasingly recognised as indispensable governance tools for enhancing institutional accountability and protecting scarce educational resources. Their deployment is also consistent with broader institutional reform objectives aimed at improving infrastructure development, research productivity, student welfare, and governance credibility.

The endemic nature of fraud within Nigerian tertiary education systems is widely documented. Reports from the Independent Corrupt Practices and Other Related Offences Commission (ICPC, 2020) reveal significant financial leakages within the education sector, undermining stakeholder trust and jeopardising service delivery outcomes. High-profile misappropriation cases across institutions in North-Central Nigeria, such as the University of Abuja, Federal University of Agriculture Abeokuta, and the University of Ibadan, further demonstrate the limitations of orthodox audit systems in detecting complex financial misconduct schemes. These developments reinforce the imperative for embedding forensic accounting mechanisms into institutional financial governance frameworks to strengthen fraud prevention and early detection capabilities.

Consequently, forensic accounting has emerged as a critical institutional safeguard, providing a robust mechanism through which fraud can be proactively monitored and deterred. By applying systematic investigative procedures, forensic practitioners interrogate financial records, analyse behavioural patterns, and identify anomalies that conventional oversight mechanisms might overlook. Through these interventions, forensic accounting serves not only as a fraud detection mechanism but also as a catalyst in cultivating ethical conduct, enhanced accountability, and strengthened governance culture among financial management personnel (Adebayo, 2020; Okoye & Gbegi, 2013).

Despite its growing relevance, the institutionalisation of forensic accounting practices within Nigerian public tertiary institutions continues to encounter implementation challenges. These include inadequate technical capacity, limited managerial awareness, insufficient budgetary

support, and skill gaps among internal audit personnel (Ugochukwu, Adetola & Ifeanyi, 2021). Moreover, entrenched corruption norms and weak enforcement of regulatory frameworks constrain the potency of forensic interventions (Owolabi & Egbide, 2012). Addressing these constraints is therefore fundamental to optimising the fraud-deterrence potential of forensic accounting and sustaining institutional credibility within the higher education sector of North-Central Nigeria.

Financial fraud within Nigerian public tertiary institutions has become an endemic governance concern, threatening institutional credibility, fiscal sustainability, and operational efficiency. Empirical evidence and investigative accounts reveal recurrent incidences of embezzlement, contract inflation, procurement manipulation, and financial misreporting—often implicating senior administrators and finance officers. For example, the University of Abuja recorded a major misappropriation scandal involving ₦1.5 billion in 2016, exposing structural weaknesses in its internal control environment. Likewise, universities such as FUNAAB, FUTA, UNICAL, and OAU have witnessed publicised financial malpractices involving diversion of funds earmarked for core institutional functions, including infrastructure development, research enhancement, and student support services.

Although traditional audit systems have been deployed to address these irregularities, the sophistication and adaptive nature of contemporary fraud schemes necessitate more proactive and investigative tools. Forensic accounting offers such an alternative, enabling real-time detection of anomalies, analytical interrogation of financial behaviour, and prevention-oriented interventions before substantial losses materialise. However, despite its potential significance, empirical research evaluating the applicability, effectiveness, and institutional outcomes of forensic accounting techniques within Nigerian tertiary institutions remains limited. This research gap constitutes a fundamental motivation for the present study, which seeks to assess the extent to which forensic accounting techniques contribute to fraud deterrence within public universities in North-Central Nigeria. This study therefore, specifically seeks to;

- i. Evaluate the effect of assets tracing and recovery on fraud prevention and deterrence in Nigerian public Tertiary institutions.
- ii. Appraise the effect of expert witness testimony on fraud prevention and deterrence in Nigerian public Tertiary institutions.
- iii. Investigate the effect of whistleblowing and anonymous response on fraud prevention and deterrence in Nigerian public Tertiary institutions.

CONCEPTUAL CLARIFICATION

Fraud Deterrence

Fraud deterrence refers to intentional strategies deployed by organizations, regulators, and enforcement bodies to discourage fraudulent conduct by increasing the perceived risks and consequences associated with wrongdoing. Unlike fraud prevention, which focuses primarily on eliminating opportunities, deterrence emphasizes behavioural influence by heightening the psychological cost of engaging in fraud (Wells, 2014). Grounded in deterrence theory, it assumes that individuals are less likely to commit fraud when they believe the probability of detection and punishment is high. In public tertiary institutions in Nigeria, where systemic inefficiencies and weak oversight often create fertile ground for financial misconduct,

mechanisms such as enforced ethical codes, segregation of duties, staff vetting, and transparency frameworks are necessary to establish an integrity-driven institutional climate.

Forensic accounting techniques constitute a crucial component of fraud deterrence, as they introduce sophisticated investigative tools capable of detecting and discouraging financial irregularities. Methods such as forensic auditing, data analytics, digital forensics, lifestyle assessment, continuous transaction monitoring, and inventory tracking elevate surveillance capacity and signal institutional intolerance for fraud (Hopwood, Leiner, & Young, 2012). Their visible application cultivates a heightened awareness among employees that transactions and behaviours are subject to scrutiny, thereby reinforcing deterrence. Complementary measures, including regular audits, fraud risk assessments, and clearly enforced disciplinary sanctions, create a hostile environment for fraud by embedding accountability, narrowing loopholes, and establishing consequences that outweigh potential benefits (Albrecht, Albrecht & Albrecht, 2019).

Moreover, the presence of forensic accounting units within governance structures strengthens deterrence by promoting ethical culture, enforcing compliance, and facilitating whistle-blowing systems that reduce concealment opportunities (Bologna & Lindquist, 1995). These mechanisms align with deterrence theory's emphasis on certainty and swiftness of sanctions (Becker, 1968), thereby shaping behaviour across administrative hierarchies. In Nigerian public tertiary institutions, fraud deterrence therefore extends beyond internal controls to a broader institutional paradigm in which forensic accounting embeds proactive monitoring, disciplinary procedures, ethical training, and transparency systems. Through these coordinated actions, institutions cultivate a high-risk environment for fraudsters, promote responsible stewardship, enhance stakeholder confidence, and strengthen overall governance effectiveness.

Forensic Accounting Techniques

Forensic accounting is a specialized field that combines accounting, auditing, investigative, and legal expertise to detect and prevent financial fraud. It involves gathering and analyzing financial evidence suitable for legal proceedings and implementing investigative procedures to identify irregularities (Akenbor & Ironkwe, 2021). This study therefore examined some the techniques as discussed below;

Asset Tracing and Recovery Technique

Asset tracing and recovery constitute a central component of forensic accounting, designed to identify, track, and reclaim financial resources that have been illegally diverted or concealed. In the Nigerian context, particularly within public tertiary institutions where misappropriation and embezzlement remain recurrent issues, this method has become vital in reconstructing financial pathways and establishing accountability (Naz & Khan, 2024). Tracing involves systematically following the movement of illicitly obtained resources, while recovery requires coordinated legal and investigative actions to repossess stolen assets (Navarrete & Gallego, 2023). This combination of investigative and judicial expertise allows institutions to reverse fraudulent losses, reinforce proper stewardship of public funds, and restore confidence in internal financial controls.

Crucially, asset tracing and recovery act as strong deterrents to fraud by signalling that economic crimes will be uncovered and punished. The ability of forensic accountants to trace stolen funds through transaction analysis and institutional records increases offenders' perception of being detected, which discourages future misconduct (Okoye & Gbegi, 2013).

Scholars such as Akinbowale et al. (2021) argue that the use of robust tracing systems enhances accountability by identifying perpetrators and securing legal sanctions, while Lawal et al. (2020) note that successful prosecutions and asset recoveries send cautionary messages throughout academic institutions. Consequently, the institutionalisation of asset tracing frameworks heightens awareness that fraud carries tangible consequences, thereby deterring individuals from engaging in financial improprieties. The study therefore states that;

Ho1: *Asset tracing and recovery have no significant effect on fraud deterrence in Nigerian public tertiary institutions.*

Expert Witness Testimony Technique

Expert witness testimony involves forensic accountants presenting professional insight and analytical findings before legal tribunals to assist in the interpretation of complex financial evidence. Scholars such as Okafor and Agbiogwu (2022), Zardasht et al (2022), and Onodi, Okafor and Onyali (2021) assert that expert witnesses offer technical clarity that strengthens adjudication processes related to fraud. These professionals apply advanced knowledge of accounting standards, investigative procedures, and evidence analysis, thereby ensuring that financial irregularities are accurately explained and defensible in court (Singal et al., 2019). Mwonge and Naho (2022) further contend that credible expert testimony enhances judicial confidence and improves the likelihood of securing convictions in financial crime cases.

Beyond their evidentiary function, expert witnesses contribute directly to fraud deterrence by raising the perceived likelihood of punishment. As Alamry, et al (2022) note, awareness of forensic accountants' courtroom role discourages potential offenders, since fraudulent actions can be traced and legally substantiated. Lawal et al. (2023) and Akeke and Atah (2023) highlight that expert testimony also serves to educate institutional stakeholders about the consequences of corruption, fostering a culture of integrity within universities. To enhance this preventive capacity, scholars such as Sule et al. (2019), Inyada et al. (2019) and Okoye and Ndah (2019) advocate for stronger collaboration between forensic practitioners and legal bodies, alongside professional certification frameworks that increase credibility and strengthen deterrent effect in tertiary institutions.

Ho2: *Expert witness testimony has no significant effect on fraud deterrence in Nigerian public tertiary institutions.*

Whistleblowing and Anonymous Response Mechanisms

Whistleblowing involves insiders exposing fraudulent or unethical behaviour within organisations (Miceli, Near & Dworkin, 2018), while anonymous reporting channels enable such disclosures without personal risk. These mechanisms are particularly important in environments where retaliation fears suppress reporting. Kaplan et al. (2019) argue that whistleblowing serves dual functions: it prevents fraud by providing early detection signals and deters fraud by increasing the perceived probability of exposure. Within Nigerian public tertiary institutions, systemic weaknesses and opacity heighten the need for whistleblowing frameworks that strengthen governance and enhance financial accountability.

Grounded in deterrence theory, where wrongdoing declines when individuals believe they will be detected (Becker, 1968) and agency theory, which emphasises monitoring mechanisms to manage principal–agent conflicts (Jensen & Meckling, 1976), whistleblowing frameworks elevate institutional oversight. Legal provisions such as Nigeria's Whistle-blower Protection

Policy (2016) support anonymous disclosures and incentivise reporting, reinforcing fraud deterrence. Empirical findings show that reporting hotlines remain the most effective means of fraud detection globally, accounting for over 42% of discoveries (ACFE, 2022), while Nigerian agencies such as EFCC and ICPC confirm substantial recoveries linked to whistleblower tips. Forensic accountants operationalise these systems through secure portals, confidentiality protocols, and ethical awareness programmes (Taylor & Curtis, 2010), which collectively enhance institutional transparency and promote deterrence.

Ho3: Whistleblowing and anonymous response have no significant effect on fraud deterrence in Nigerian public tertiary institutions.

Empirical Reviews

Naz and Khan (2024) examined the role of forensic accounting in fraud deterrence among Pakistani firms and found that investigation and litigation support practices significantly reduce fraud, although their reliance on an unspecified questionnaire sample limits broad inference. Building on this finding, Navarrete and Gallego (2023) reinforced the fraud-deterrent potential of forensic tools using 56 expert respondents, showing that forensic techniques work proactively and reactively. However, similar to Naz and Khan (2024), their exploratory method and small sample suggest the need for stronger empirical grounding.

Expanding this debate into the Nigerian context, Akeke and Atah (2023) demonstrated that forensic techniques such as computer-assisted audits and interviews deter fraud among auditors in Cross River State. While their results substantiate earlier conclusions, the narrow geographic scope again restricts generalization. In a related Nigerian study, Lawal et al. (2023) also confirmed that forensic skills enhance fraud deterrence among accountants in Ekiti State, except document review skills and, like Akeke and Atah (2023), highlighted the limitation of sampling only professional accountants.

Similarly, Alamry et al (2022) evaluated Iraqi listed companies and showed that forensic practices backed by strong internal controls improve fraud deterrence, suggesting the potential for contextual replication in Nigeria, where similar institutional weaknesses exist. This need is reinforced by Mwonge and Naho (2022), who analysed Nigerian public sector workers and found that over-reliance on traditional audits and lack of forensic capacity weaken deterrence effectiveness, signalling a gap in knowledge application compared to the Iraqi findings.

Supporting these Nigerian studies, Zachariah et al. (2022) observed that forensic auditing reduces fraud in banks, although their descriptive approach limited deeper analytical insight. Extending this banking-sector evidence, Onodi et al. (2021) showed that forensic skills strengthen prosecution efficiency in Nigerian banks, yet practitioner knowledge gaps remain, echoing the skills deficit highlighted by Mwonge and Naho (2022). Finally, Akenbor and Ironkwe (2021) showed that proactive and reactive forensic techniques reduce fraud in public institutions in Rivers State, but their use of correlation analysis constrains causal interpretation, further underscoring the recurring methodological limitations identified across previous studies.

Theoretical Framework

This study is anchored on the Fraud Triangle Theory. The Fraud Triangle Theory, propounded by Donald Cressey in 1953 and refined in the early 1970s, provides a robust theoretical framework for understanding fraud occurrence and prevention in public tertiary institutions.

The theory posits that fraud arises when three elements; pressure, opportunity, and rationalization coexist. Pressure encompasses financial or organizational stress that motivates an individual to commit fraud, including personal financial needs, workplace compensation pressures, or threats to the institution's financial stability. Opportunity refers to weaknesses in internal controls or management oversight that allow employees to exploit access to assets or data for fraudulent purposes. Rationalization is the process by which an individual justifies fraudulent behaviour as acceptable within their personal ethical framework. In the context of public tertiary institutions, such as universities, staff involved in bursary, procurement, and financial management functions may face pressures related to resource allocation, personal financial needs, or administrative targets, while gaps in control systems and oversight create opportunities for manipulation of financial records or misappropriation of resources. Rationalization then allows individuals to perceive fraudulent acts as acceptable, particularly in environments with weak enforcement or accountability mechanisms.

Anchoring this study on the Fraud Triangle Theory is because it aligns closely with the objectives of examining forensic accounting techniques and their role in fraud deterrence. Forensic accounting tools such as asset tracing, expert witness services, financial statement analysis, and whistleblowing mechanisms—are strategically designed to disrupt the elements of the fraud triangle. By strengthening internal controls, improving transparency, and providing mechanisms for reporting and investigating irregularities, these techniques reduce opportunities for fraud, challenge rationalizations, and mitigate pressures through institutional accountability. Applying this theory allows the study to conceptually link forensic accounting practices to the prevention and deterrence of fraud in public tertiary institutions, demonstrating how targeted interventions can weaken the conditions that facilitate fraudulent behaviour and reinforce institutional integrity.

METHODOLOGY

This study employed a survey research design to investigate the influence of forensic accounting techniques on fraud deterrence at Federal University Lafia (FU Lafia), Nigeria. Structured questionnaires were used to obtain primary data on respondents' perceptions, experiences, and application of techniques such as data analytics, financial statement analysis, interviews and interrogations, asset tracing, expert testimony, and whistleblowing. The bursary department staff constituted the study population due to their involvement in complex administrative and financial operations that heighten exposure to fraud risks. A total of 250 questionnaires were administered to purposively selected non-academic staff within the bursary department at FU Lafia to ensure an adequate sample size for reliable statistical analysis and robust application of techniques, out of which 230 were retrieved. The department was selected for its accessibility and relevance to fraud-risk exposure within institutional financial systems. Data were analysed using both descriptive and inferential statistical techniques. Specifically, the study employed Structural Equation Modeling (SEM), supported by Confirmatory Factor Analysis (CFA) and multicollinearity diagnostics, to examine the relationships among latent constructs and to assess the direct and collective effects of forensic accounting techniques on fraud deterrence.

The analysis followed a two-stage approach. First, the measurement model was evaluated using Confirmatory Factor Analysis (CFA) to validate the relationships between observed questionnaire items and their respective latent constructs, namely Assets Tracing and Recovery (ASTR), Expert Witness Techniques (EXPW), Whistleblowing and Anonymous Response

(WBAR), and Fraud Deterrence (FDET). Convergent validity was assessed using factor loadings (≥ 0.70), composite reliability (≥ 0.70), and average variance extracted ($AVE \geq 0.50$), while discriminant validity was established using the Fornell–Larcker criterion.

Model fit was further assessed using standard fit indices. The Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) with acceptable thresholds of ≥ 0.90 , and the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) with values of ≤ 0.08 , were used to evaluate the adequacy of both the measurement and structural models (Hu and Bentler, 1999; Hair et al., 2010).

Following satisfactory validation of the measurement model, the structural model was estimated to examine the hypothesized relationships among latent variables. In this study, forensic accounting techniques (FAT) were modeled as a higher-order construct comprising three dimensions: Assets Tracing and Recovery (ASTR), Expert Witness Techniques (EXPW), and Whistleblowing and Anonymous Response (WBAR), while Fraud Deterrence (FDET) was specified as the dependent latent construct.

Model Specification

The SEM framework captures both the measurement relationships and the structural paths among constructs. The functional relationships are expressed as:

Latent Constructs and Indicators

$$FDET = f(FAT) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (i)$$

$$FAT = f(ASTR, EXPW, WBAR) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (ii)$$

Structural Model (SEM Path Model):

$$\text{Path } \beta_1 = (ASTR \rightarrow FDET) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (iii)$$

$$\text{Path } \beta_2 = (EXPW \rightarrow FDET) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (iv)$$

$$\text{Path } \beta_3 = (WBAR \rightarrow FDET) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (v)$$

Effect of FAT on FDET

$$FDET = \beta_1(ASTR) + \beta_2(EXPW) + \beta_3(WBAR) + \zeta \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (vi)$$

Where:

Dependent Variables:

FDET = Fraud Deterrence

Independent Variables:

FAT = Forensic Accounting Techniques

ASTR = Assets Tracing and Recovery

EXPW = Expert Witness Techniques

WBAR = Whistleblowing and Anonymous Response

β_0	=	Constant
$\beta_1 - \beta_3$	=	Coefficient
e	=	error term

This model allowed for the empirical examination of the effectiveness of each forensic accounting technique in deterring fraud, providing an assessment of their collective and individual contributions to fraud deterrence in the university setting.

DATA PRESENTATION AND ANALYSIS

Descriptive Statistics

This section presents the descriptive statistics of the data for the study. It shows the Mean, Standard deviation (SD), Minimum (MIN) and Maximum (MAX) of data variables. The result of descriptive statistics is presented on Table 1.

Table 1: Descriptive Statistics

Variables	Obs.	Mean	S.D.	Min	Max
Fdet	230	3.5588	7.2712	-14	20
Astr	230	29.7906	4.5872	14	43
Expw	230	30.7249	7.4790	11	48
Wbar	230	30.1695	8.5142	12	48

Source: STATA 17 Output (2025)

The descriptive statistics provide meaningful insights into respondents' views on the effect of forensic accounting techniques on fraud deterrence in public universities in North-central Nigeria. For Fraud Deterrence (FDET), the mean score of 3.5588 with a relatively large standard deviation of 7.2712 suggests that, although efforts toward fraud prevention exist, experiences and perceptions vary widely across respondents. This wide dispersion may reflect differences in institutional controls, levels of fraud exposure, or inconsistencies in applying fraud mitigation strategies. Turning to the forensic accounting variables, Asset Tracing (ASTR) recorded a mean of 29.7906 and a standard deviation of 4.5872. This indicates that asset tracing practices are generally prevalent, although variations exist—possibly due to differences in internal audit capacity, availability of tracking systems, or organizational commitment to accountability procedures.

Similarly, Expert Witness Services (EXPW) shows the highest mean value of 30.7249 and a larger standard deviation of 7.4790. This implies that expert testimony is widely considered valuable in fraud prevention, but the level of exposure and engagement with such services differs notably among institutions. Variations could stem from unequal access to forensic professionals, litigation frequency, or institutional readiness to engage expert intervention. Whistleblowing and Anonymous Response (WBAR) has a mean of 30.1695 with a standard deviation of 8.5142, indicating that while whistleblowing mechanisms are recognised as essential fraud deterrence tools, their implementation and effectiveness vary significantly across respondents. This wide dispersion may reflect cultural reluctance to report fraud, fear of retaliation, weak reporting frameworks, or differing levels of management responsiveness.

Data Cleaning and Validity Checks

To validate the dataset's suitability for the analytical model, this study performed diagnostic assessments for normality, multicollinearity, and heteroscedasticity across the explanatory variables. The following section outlines the outcomes of these evaluations, including the Variance Inflation Factor (VIF) analysis and normality test results.

i. Normality Test

The Shapiro-Wilk test for data normality was conducted to test the null hypothesis that data for the variables of the study are not normally distributed, at a 5% level of significance. The result of the test is shown in Table 2.

Table 2: Shapiro-Wilk Test for Data Normality

Variables	OBS	W	Z	Prob>z
Fdet	230	0.9949	1.587	0.0563
Astr	230	0.9989	-2.086	0.9814
Expw	230	0.9983	-1.079	0.8597
Wbar	230	0.9890	3.480	0.0002

Source: STATA 17 Output (2025)

The Shapiro–Wilk normality test results provide useful insights into how the study variables behave. For Fraud Deterrence (FDET), the W statistic of 0.9949 and p-value of 0.0563, which is slightly above the 0.05 threshold, indicate no significant departure from normality, suggesting that respondents' views are sufficiently balanced for parametric analysis. Asset Tracing (ASTR) equally demonstrates strong normality, with a W value of 0.9989 and p-value of 0.9814, while Expert Witness (EXPW) follows the same trend, recording a W statistic of 0.9983 and p-value of 0.8597, meaning responses on expert testimony are symmetrically distributed. However, Whistleblowing and Reporting (WBAR) shows clear deviation from normality, as evidenced by a W value of 0.9890 and a p-value of 0.0002, which signals skewed or polarized perceptions likely driven by fears of retaliation, institutional silence norms, or weak reporting frameworks. Overall, three of the four variables exhibit acceptable normality, supporting the suitability of the dataset for parametric statistical procedures, while the abnormal distribution of WBAR highlights sensitive behavioural and institutional biases surrounding whistleblowing within public universities.

ii. Multicollinearity Test

Test for data multicollinearity was conducted using variance inflation factor;

Table 3: Variance Inflation Factor (VIF) Test

Variable	VIF	1/VIF
Expw	4.22	0.2368
Wbar	3.41	0.2933
Astr	1.00	0.9966
Mean VIF	4.12	

Source: STATA 17 Output (2025)

The Variance Inflation Factor (VIF) results indicate that multicollinearity among the independent variables is within acceptable limits, meaning the regression estimates are unlikely to be distorted by overlap among predictors. Expert Witness (EXPW) has the highest VIF value of 4.22 with a tolerance of 0.2368, suggesting some degree of shared variance with other variables but not to a problematic level since it remains below the critical threshold of 5. Whistleblowing and Anonymous Response (WBAR) follows with a VIF of 3.41 and a tolerance value of 0.2933, reflecting moderate but manageable collinearity. Asset Tracing and recovery (ASTR) recorded the lowest VIF of 1.00 with a tolerance of 0.9966, indicating virtually no multicollinearity and confirming its statistical independence in the model. The overall mean VIF of 4.12 suggests that the model is free from harmful multicollinearity, supporting the reliability and stability of the regression analysis in estimating the effects of forensic accounting techniques on fraud deterrence.

Reliability Test

To assess the internal consistency of the multi-item scales, the study employed Cronbach's Alpha for reliability testing. The indicators for each construct were examined, with an Alpha value of 0.70 or above deemed sufficient to confirm that the items consistently reflect the same underlying construct:

Table 4: Cronbach's Alpha Test

Variables	Scale	Inter-Item Covariance	Cronbach's Alpha
Astr	10 items	0.45	0.74
Expw	10 items	0.39	0.70
Wbar	10 items	0.67	0.83
Fdet	10 items	0.46	0.84

Source: STATA 17 Output (2025)

The Cronbach's Alpha test results indicate that the measurement scales used in the study exhibit satisfactory internal consistency. Specifically, Asset Tracing (ASTR) recorded an alpha of 0.74, Expert Witness (EXPW) 0.70, Whistleblowing and Anonymous Response (WBAR) 0.83, and Fraud Deterrence (FDET) 0.84, demonstrating that all constructs meet or exceed the conventional 0.70 threshold for acceptable reliability. The higher values for WBAR and FDET suggest particularly strong consistency among the items measuring whistleblowing practices and fraud deterrence outcomes, while ASTR and EXPW show moderate but adequate reliability. These results confirm that the questionnaire items are well-aligned and consistently capture the intended dimensions of each variable, supporting the appropriateness of the instruments for assessing the effect of forensic accounting techniques on fraud prevention in Federal University Lafia, Nigeria.

Model Fit Statistics

The Model Fit statistics results provide an overall assessment of how well the specified structural equation model fits the observed data. These statistics evaluate whether the theoretical model accurately captures the relationships among variables as reflected in the data.

Table 5: Model Fit Statistics

Statistics	Value
R-Square	0.647
Chi ² (p-value)	1595.48/0.001
CFI	0.334
TLI	0.198
RMSEA	0.427
SRMR	0.178
CD	0.647

Source: STATA 17 Output (2025)

The structural equation model assessing the effect of forensic accounting techniques on fraud prevention and deterrence in public universities in North-central Nigeria exhibited suboptimal fit indices, indicating that the specified model does not adequately represent the observed data. While the R-Square (0.6466) and Coefficient of Determination (CD = 0.647) suggest that approximately 65% of the variance in the outcome variables is explained by the model, the goodness-of-fit statistics raise concerns about model adequacy.

The Chi-square test ($\chi^2 = 1595.48$, $p = 0.001$) is significant, indicating poor fit, and the Comparative Fit Index (CFI = 0.334) and Tucker-Lewis Index (TLI = 0.198) fall well below the acceptable 0.90 threshold, reflecting weak comparative and incremental fit. Furthermore, the RMSEA (0.427) and SRMR (0.178) exceed standard cut-offs, suggesting substantial approximation and residual errors. These results imply that the initial model did not accurately capture the structural relationships among variables. To address these limitations and enhance model reliability, the model was re-specified using the `vce(robust)` option, which allows for robust standard error estimation and accounts for potential heteroscedasticity and specification errors, thereby improving the validity of subsequent parameter estimates.

Table 6: Result for Fraud Deterrence

Variables	Coefficients	Z	p>/z/
Astr	-0.0461	-0.48	0.634
Expw	-0.1852	-2.10	0.036
Wbar	-0.1014	-1.11	0.266

Source: STATA 17 Output (2025)

The analysis of the effect of forensic accounting techniques on fraud deterrence in public universities in North-central Nigeria indicates varying impacts across the techniques. Asset Tracing and Recovery (ASTR) shows a negative but statistically insignificant effect (coefficient = -0.0461, $Z = -0.48$, $p = 0.634$), suggesting that, in this context, tracing assets alone does not meaningfully influence fraud deterrence. Expert Witness (EXPW), however, exhibits a negative and statistically significant effect (coefficient = -0.1852, $Z = -2.10$, $p = 0.036$), indicating that reliance on expert testimony in its current application may not effectively deter fraud and could reflect challenges in leveraging expert interventions within institutional processes. Whistleblowing and Anonymous Response (WBAR) also shows a negative but non-significant effect (coefficient = -0.1014, $Z = -1.11$, $p = 0.266$), suggesting

that the mechanisms for anonymous reporting are either underutilized or insufficiently institutionalized to significantly reduce fraudulent behaviour. Overall, the results highlight that while some forensic accounting techniques may have potential, their effectiveness in these universities appears limited, underscoring the need for improved implementation and integration of these tools into institutional fraud prevention frameworks.

Re-cast each section of the discussion of findings based on the content in the table;

Variables	Coefficients	Z	p>/z/
Astr	-0.0461	-0.48	0.634
Expw	-0.1852	-2.10	0.036
Wbar	-0.1014	-1.11	0.266

DISCUSSION OF FINDINGS

The findings of this study provide insightful evidence on the effect of various forensic accounting techniques on fraud prevention and deterrence in public universities across North-Central Nigeria.

Effect of Assets Tracing and Recovery on Fraud Deterrence

Contrary to the a priori expectation that asset tracing would significantly deter fraud, the empirical results indicate that asset tracing (ASTR) has a negative and statistically insignificant effect on fraud deterrence (coefficient = -0.0461, $Z = -0.48$, $p = 0.634$). This suggests that the tracing and recovery of assets alone does not meaningfully reduce fraudulent behaviour within the institutions studied, possibly due to inconsistent implementation, insufficient follow-up actions, or limited institutional capacity to enforce recovery mechanisms. The findings imply that while asset tracing is conceptually valuable, its practical impact on preventing fraud is minimal unless integrated with other proactive forensic measures and supported by effective institutional enforcement. This aligns with Agency Theory, which emphasizes the need for monitoring mechanisms beyond routine controls to mitigate managerial opportunism, and Routine Activity Theory, as the absence of capable guardianship reduces the deterrent effect of asset tracing. Empirical studies such as those by Zachariah, Musa, and Ibrahim (2020) further suggest that forensic techniques like asset tracing may be limited in effectiveness if applied in isolation or without comprehensive enforcement strategies.

Effect of Expert Witness on Fraud Deterrence

Expert witness services (EXPW) were expected to significantly enhance fraud prevention; however, the results show a negative but statistically significant effect (coefficient = -0.1852, $Z = -2.10$, $p = 0.036$). This indicates that while expert testimony is utilized in institutional investigations, its current application may inadvertently fail to deter fraud effectively. The negative association could reflect challenges in integrating expert findings into institutional decision-making or delays in enforcement that reduce the perceived risk of detection among potential offenders. The result partially supports the Fraud Triangle Theory, as opportunities for fraud may persist despite expert interventions, the importance of institutional responsiveness and procedural enforcement to translate expert contributions into effective deterrence. Empirical evidence from Lawal et al. (2023) and Mwonge and Naho (2022) supports the view that forensic interventions can reduce fraud, but divergence with Okunbor

and Obaretin (2017) suggests that contextual and organizational differences influence outcomes, highlighting the need for capacity-building and formalized procedures for expert witness integration.

Effect of Whistleblowing and Anonymous Response on Fraud Deterrence

Whistleblowing and anonymous reporting (WBAR) were expected to have a significant positive effect on fraud prevention, but the empirical findings reveal a negative and statistically insignificant effect (coefficient = -0.1014, $Z = -1.11$, $p = 0.266$). This suggests that these mechanisms are either underutilized or inadequately institutionalized, limiting their impact on deterring fraudulent behaviour. The negative direction may stem from cultural reluctance to report colleagues, fear of retaliation, or weak confidentiality protocols that reduce employee confidence in the system. While theories such as the Fraud Diamond Theory suggest that enhanced reporting mechanisms increase detection capability, the weak empirical effect indicates that institutional factors, enforcement, and awareness campaigns are critical for whistleblowing initiatives to function effectively. Empirical support is mixed: Okafor and Agbiogwu (2022), Zachariah et al. (2022), and Alhassan (2021) show positive roles for forensic accounting skills and reporting systems, whereas Enofe, Okpako, and Atube (2019) found that detection does not always translate into prevention, highlighting that effectiveness depends on institutional enforcement and the broader organizational culture.

Overall, the findings suggest that while forensic accounting techniques such as asset tracing, expert witness services, and whistleblowing have conceptual potential to deter fraud, their effectiveness in the public university context is constrained by implementation gaps, institutional culture, and enforcement limitations. Strengthening these mechanisms through structured procedures, robust policy frameworks, and management commitment is essential to enhance their preventive and deterrent impact.

SUMMARY AND CONCLUSION

This study examined the effect of forensic accounting techniques—specifically assets tracing and recovery, expert witnessing, and whistleblowing and anonymous response—on fraud deterrence in public universities, with Federal University, Lafia as the focal institution. The empirical evidence indicates that these techniques, in their current application, have limited effectiveness in deterring fraud. Asset tracing and recovery showed a negative and statistically insignificant effect on fraud deterrence, suggesting that while conceptually valuable, it is inadequately implemented or enforced within the institutions. Similarly, expert witnessing revealed a negative but statistically significant effect, implying that although expert testimony is utilized, institutional delays or procedural gaps may reduce its preventive impact. Whistleblowing and anonymous reporting also showed a negative and insignificant effect, indicating underutilization or insufficient institutional support for employees to report fraudulent activities confidently. Collectively, these findings suggest that while forensic accounting techniques have the potential to strengthen fraud control, improve transparency, and enhance accountability, their effectiveness is heavily constrained by implementation gaps, institutional culture, and enforcement limitations. Strengthening these mechanisms through structured procedures, robust policies, and committed management is crucial to maximize their preventive and deterrent impact within Nigerian public universities.

The empirical findings concludes that assets tracing and recovery, expert witnessing, and whistleblowing and anonymous response, while conceptually valuable, currently exhibit

limited effectiveness in deterring fraud at Federal University, Lafia. Assets tracing and recovery and whistleblowing showed negative and statistically insignificant effects, suggesting inadequate implementation or low employee engagement, whereas expert witnessing showed a negative but significant effect, highlighting procedural or enforcement gaps that may undermine its preventive potential. These results suggest that the effectiveness of forensic accounting techniques is heavily dependent on institutional support, procedural rigor, and the availability of skilled personnel. Overall, while forensic accounting tools have the potential to strengthen financial integrity, enhance transparency, and reduce fraud risks, their impact is constrained when not fully integrated into institutional systems and practices. The study birth the necessity for Nigerian public universities to strengthen the implementation of these techniques, embed them into policies, and foster a culture of accountability to realize the full benefits of forensic accounting in promoting effective financial governance.

Recommendations

In line with the findings, the following recommendations are hereby made;

- i. Given the negative and insignificant effect of assets tracing and recovery on fraud deterrence, Federal University, Lafia should strengthen the operational framework for tracing and recovering misappropriated assets. This involves acquiring software tools that track asset movements and implementing standardized procedures for monitoring, documenting, and recovering university resources. Additionally, staff involved in bursary, procurement, and internal audit functions should receive specialized training to enhance skills in asset verification, tracking, and recovery processes, thereby improving the effectiveness of this technique in deterring fraud.
- ii. The negative but statistically significant effect of expert witnessing suggests procedural gaps that reduce its preventive impact. The university should formalize processes for documenting expert analyses, providing testimony in internal investigations, and ensuring accountability in decision-making. Establishing a review panel of auditors and forensic experts to examine suspicious transactions and present findings in a structured, actionable format can strengthen fraud prevention. Continuous professional development in forensic reporting, evidence evaluation, and audit procedures will further improve the effectiveness of expert witnessing in deterring fraudulent behaviour.
- iii. Whistleblowing and anonymous response showed negative and statistically insignificant effects, indicating underutilization or low staff confidence. The university should implement a robust whistleblowing policy that guarantees confidentiality, protection against retaliation, and clear reporting channels. Awareness campaigns, incentives, and periodic training on how to report fraud safely can encourage staff participation. Establishing an independent compliance or ethics office to manage reports and track outcomes will enhance trust and improve the preventive impact of whistleblowing mechanisms.

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