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# Moderating Effect of Technological Infrastructure on the Relationship Between Forensic Accounting Skills and Financial Fraud Detection in Nigeria's Federal Ministry of Finance and Its Agencies

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Abstract

*The increasing complexity of financial crimes within Nigeria's public sector, particularly in the Federal Ministry of Finance, necessitates a robust forensic approach to fraud detection. This study investigates the moderating effect of technological infrastructure on the relationship between forensic accounting skills such as IT expertise, data analytics, accounting and auditing skills, as well as legal knowledge and financial crime detection. Grounded in the Resource-Based View (RBV), the study conceptualizes these forensic skills as strategic internal resources, while technological infrastructure is treated as a moderating enabler. A mixed-method survey design was adopted, and data were collected from 365 professionals across selected MDAs using stratified random sampling. Descriptive statistics, correlation analysis, and multiple regression were used to analyze the data. Findings reveal that all three forensic accounting skill sets significantly and positively affect financial crime detection, with IT and data analytics skills having the strongest impact. More importantly, technological infrastructure significantly moderates these relationships, enhancing the effectiveness of forensic skills in environments with adequate digital tools and systems. The study concludes that forensic capacity-building without concurrent investment in technological infrastructure limits fraud detection outcomes. Recommendations include increased investment in digital forensic tools across MDAs, mandatory forensic training programs, legal capacity strengthening, establishment of in-house forensic audit units, and inter-agency collaboration through centralized fraud monitoring platforms. These measures are essential for improving accountability, transparency, and financial governance in Nigeria's public sector.*

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## 1 INTRODUCTION

The increasing incidence of financial crimes in Nigeria's public sector has necessitated the adoption of sophisticated tools and expert interventions to detect and deter fraudulent practices, particularly within critical institutions such as the Federal Ministry of Finance and affiliated agencies. Traditional auditing techniques have proven insufficient in addressing the complexities of modern financial fraud, thereby underscoring the increasing reliance on forensic accounting as a strategic tool for enhancing financial crime detection. Forensic accounting integrates a broad set of competencies including information technology and data analytics skills, accounting and auditing skills, and legal knowledge each of which is essential in identifying, investigating, and preventing economic and financial crimes (Albrecht et al., 2023; Crumbley et al., 2015).

However, the effective application of forensic accounting skills does not operate in a vacuum. Emerging evidence suggests that technological infrastructure—defined as the availability and functionality of digital tools, forensic audit software, secure databases, and analytical platforms—plays a critical moderating role in the extent to which forensic competencies can influence financial crime detection outcomes (Bierstaker et al., 2016; Okwu & Oraka, 2019). For instance, the use of Computer-Assisted Audit Tools (CAATs), forensic data mining software (e.g., IDEA, ACL), and secure information systems significantly enhance the speed, accuracy, and depth of fraud investigations (ACFE, 2022). In environments where technological infrastructure is lacking or underdeveloped, forensic accountants may be limited in their ability to process and analyze large volumes of financial data effectively (Okoye & Gbegi, 2013).

The forensic accounting skillset comprises several domains. IT and data analytics skills allow practitioners to detect patterns, outliers, and anomalies in vast datasets. Accounting and auditing skills form the foundation for assessing the integrity of financial reports and internal controls. Meanwhile, legal knowledge ensures that investigations comply with procedural standards and are admissible in court (Singleton & Singleton, 2010; DiGabriele, 2021). These skills collectively contribute to robust financial crime detection mechanisms, particularly when reinforced by advanced technological systems.

Financial fraud detection has been studied widely, with dependent (i.e., occurrence/detection of fraud) and independent (predictors of fraud detection) variables established (Olaoye & Olanipekun, 2020; Nwaiwu & Aaron, 2023; Novita et al., 2025). The independent variables of financial fraud detection are explored mainly via the use of fraud drivers' triangle (pressure, opportunity, and rationalization, regarded as primary drivers that push individuals to financial reporting fraud) or fraud diamond/pentagon and fraud heptagon theoretical frameworks to ascertain the predictors (Novita et al., 2025). The fraud heptagon framework provides a holistic view of fraud detection by extending the fraud triangle, pentagon and hexagon theories by incorporating special, in addition to competence and arrogance factors, elements like technology and emerging changes in as variable in systems that is prone to external pressures and institutional weaknesses (e.g., financial targets, debt pressure, change of auditor or non-financial factors like CEO tenure) in financial fraud detection. Moderating variables (the "It Depends" factors such as how company size, corporate governance, and individual technical competencies) and how they can change strongly the predictors, thereby leading to fraud) have also been discussed (Novita et al., 2025).

In Nigeria, forensic accounting has been adopted as a strategic mechanism for tackling financial fraud, Nigeria's public sector including the Federal Ministry of Finance and its agencies. Nonetheless, Nigeria continues to witness alarming levels of financial misconduct and misappropriation of public funds. Recent revelations by the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices Commission (ICPC) underscore the persistence of financial irregularities. For instance, in 2023, a high-ranking accountant in the Ministry of Humanitarian Affairs was indicted for allegedly diverting over ₦37 billion meant for poverty alleviation and social investment programs into personal and proxy accounts (Premium Times, 2023). Similarly, multiple financial officers within the Ministry of Finance were investigated for processing fraudulent payments exceeding ₦11 billion without proper documentation or oversight (Punch, 2023). While previous studies in Nigeria (e.g., Okoye & Gbegi, 2013; Olaoye & Olanipekun, 2020) have examined the direct relationship between forensic accounting and fraud detection, the conditional variables that may enhance or hinder the application of forensic accounting skills are often overlooked. leaving a significant gap in exploring moderating effects such as technological capacity, especially within ministries, departments, and agencies contexts, characterised by underfunded IT systems and weak digital governance (Olaoye & Olanipekun, 2020; Nwaiwu & Aaron, 2023). These high-profile cases reveal that despite the increasing deployment of forensic accountants in Nigeria's public institutions, gaps remain in understanding how technological infrastructure amplifies or constrains the effectiveness of forensic accounting skills in curbing financial crimes.

There is also a limited exploration of the role of technological infrastructure as a moderator—a crucial gap considering the increasing digitalization of financial crimes. The availability and efficiency of forensic tools such as Computer-Assisted Audit Techniques (CAATs), fraud analytics software, and secure data systems can significantly influence the effectiveness of forensic investigators. Furthermore, very few studies are grounded in integrative theoretical frameworks like the Technology-Organization-Environment (TOE) framework or the Resource-Based View (RBV),

which can help explain how internal capabilities (forensic skills) interact with external resources (technology) to produce strategic outcomes like enhanced fraud detection. This reveals a theoretical gap that weakens the explanatory power of existing research.

In the Nigerian public sector context, the need for improved financial crime detection has gained urgency following the reported fraudulent diversions such as the ₦37 billion diversion in the Ministry of Humanitarian Affairs and the ₦11 billion payment fraud involving finance ministry officials (Premium Times, 2023; Punch, 2023). Effective financial crime detection is critical for promoting transparency, accountability, and sustainable fiscal governance. Indicators of detection efficiency may include the number of fraud cases exposed, successful recoveries, reduction in audit queries, and increased prosecution rates (Olaoye & Olanipekun, 2020).

This study, therefore, seeks to bridge these gaps by investigating the moderating effect of technological infrastructure on the relationship between forensic accounting skills (IT and data analytics skills, accounting and auditing skills, and legal knowledge) and the effectiveness of financial crime detection in Nigeria's Federal Ministry of Finance and its agencies. Specifically, it seeks to:

i. Examine the effect of IT and data analytics skills on financial crime detection in Nigeria's Federal Ministry of Finance and its agencies.
ii. Assess the influence of accounting and auditing skills on financial crime detection in the Ministry.
iii. Evaluate the effect of legal knowledge skills on financial crime detection in the Ministry.
iv. Investigate the moderating effect of technological infrastructure on the relationship between IT and data analytics skills and financial crime detection.
v. Determine the moderating effect of technological infrastructure on the relationship between accounting and auditing skills and financial crime detection.
vi. Analyze the moderating effect of technological infrastructure on the relationship between legal knowledge skills and financial crime detection.

Based on the objectives above, the following null hypotheses are formulated for testing:

$H_{01}$: *IT and data analytics skills have no significant effect on financial crime detection in Nigeria's Federal Ministry of Finance and its agencies.*
$H_{02}$: *Accounting and auditing skills have no significant effect on financial crime detection in the Ministry.*
$H_{03}$: *Legal knowledge skills have no significant effect on financial crime detection in the Ministry.*
$H_{04}$: *Technological infrastructure does not significantly moderate the relationship between IT and data analytics skills and financial crime detection.*
$H_{05}$: *Technological infrastructure does not significantly moderate the relationship between accounting and auditing skills and financial crime detection.*
$H_{06}$: *Technological infrastructure does not significantly moderate the relationship between legal knowledge skills and financial crime detection.*

## 2 LITERATURE REVIEW

### *2.1 Conceptual Review*

#### *2.1.1 Financial Crime Detection*

Financial crime detection refers to the systematic process of identifying, investigating, and preventing of fraudulent financial activities such as embezzlement, misappropriation of funds, money laundering, electronic fraud, and unauthorized payments within public or private entities. It encompasses a variety of mechanisms, including audit trails, whistleblower systems, internal control assessments, and forensic accounting investigations aimed at uncovering irregular financial behavior (ACFE, 2022). The definition includes electronic fraud, which includes the use of IT infrastructure, which acts as both the medium for twenty-first century for financial crimes and the primary tool for their recovery (Osanyinbola, 2024). Technology infrastructure such as machine learning and artificial

intelligence is increasingly being used to identify anomalies and detect patterns that are indicative of financial fraud (Novita et al., 2025).

### *2.1.2 Forensic Accounting Skills*

Forensic accounting skills refer to a blend of technical, investigative, and legal proficiencies that empower accounting professionals to detect and prevent financial misconduct (Anghel & Poenaru, 2023). These skills are categorized into the following key domains:

### *2.1.3 IT and Data Analytics Skills*

This refers to the ability of forensic accountants to use advanced digital tools, such as Computer-Assisted Audit Techniques (CAATs), IDEA, ACL, and big data analytics, to examine large volumes of financial data for anomalies and fraud patterns (Bierstaker et al., 2006; Al Natour et al., 2025). These tools facilitate deep dives into financial transactions, enabling the detection of sophisticated fraud schemes that traditional audits might overlook.

### *2.1.4 Accounting and Auditing Skills*

These skills include proficiency in financial statement analysis, auditing procedures, internal controls, and understanding of GAAP/IFRS. Forensic accountants apply these skills to scrutinize records for inconsistencies and signs of manipulation (Albrecht et al., 2023). Such expertise is crucial in assessing compliance with financial regulations and internal control standards.

### *2.1.5 Legal Knowledge Skills*

Legal knowledge encompasses an understanding of anti-corruption laws, evidence admissibility, litigation procedures, and regulatory frameworks. Forensic accountants with legal expertise are better equipped to gather court-admissible evidence and testify as expert witnesses during financial crime prosecution (DiGabriele, 2021). Collectively, these skills enable forensic accountants to deliver comprehensive investigations that align with both financial and legal standards. However, their effectiveness is often moderated by environmental factors such as technological infrastructure, which determines access to tools, databases, and investigative resources.

### *2.1.6 Technological Infrastructure*

Technological infrastructure refers to the availability and functionality of digital systems, forensic software, secure databases, and IT tools that support financial investigations. In forensic accounting, robust technological infrastructure enhances the speed, accuracy, and depth of fraud detection (Okwu & Oraka, 2019). Without adequate infrastructure, even highly skilled forensic accountants may be unable to conduct comprehensive analyses.

In the Nigerian public sector, deficiencies in digital infrastructure such as limited automation, outdated software, and poor access to real-time financial data have frequently hindered fraud detection efforts (Nwaiwu & Aaron, 2023). Hence, this study positions technological infrastructure as a moderator that can either amplify or diminish the effectiveness of forensic accounting skills in detecting financial crimes.

## *2.2 Empirical Review*

Musa (2024), in his study titled "An Evaluation of the Effect of Forensic Accountants on Planning Management Fraud Risk Detection Procedures", Musa (2024) investigated the role of forensic accountants in detecting fraud risks within Nigerian public institutions. The study covered the period from 2017 to 2023 and adopted a survey design. A total of 150 structured questionnaires were administered to public accountants, and data were analyzed using SPSS, employing both descriptive statistics and regression analysis. The findings revealed that forensic accountants play a significant role in fraud risk detection. However, their effectiveness is often diminished by institutional limitations such as lack of access to timely data, internal resistance, and procedural bottlenecks. One major limitation of the study was its failure to examine how technological tools and infrastructure influence the effectiveness of forensic accounting. This omission presents a critical gap, particularly in a digitally evolving financial ecosystem. This study informs the current research by highlighting the need to explore moderating variables specifically technological infrastructure in the forensic accounting-fraud detection nexus.

Olaoye and Olanipekun (2023) Examines the effect of Forensic Accounting and Fraud Detection in the Nigerian Public Sector," assessed the impact of forensic accounting on fraud detection within Nigerian government ministries. The research spanned from 2015 to 2019 and adopted a mixed-method approach using structured interviews and questionnaires. Data were analyzed using regression analysis with the aid of E-Views software. The authors concluded that forensic accounting significantly improves fraud detection. However, they noted that the effectiveness of forensic practices was hindered by weak digital infrastructure and limited technological tools within the public sector. A notable limitation was the study's lack of quantitative testing of technological infrastructure as a moderating factor, leaving a gap in understanding how IT infrastructure might enhance or impair forensic effectiveness. This study provides the basis for the present research to empirically test technological infrastructure as a moderator in the forensic accounting–fraud detection relationship.

Nwaiwu and Aaron (2023) Evaluates the Role of Forensic Accounting in Fraud Control in the Nigerian Public Sector," examined the role of forensic accounting skills in detecting fraud between 2016 and 2022. The researchers employed a survey design, with questionnaires administered to 200 accountants working in Ministries, Departments, and Agencies (MDAs). The data were analyzed using multiple regression and correlation analysis. Findings showed that forensic accounting skills, particularly auditing and investigative abilities improve fraud detection. However, bureaucratic inefficiencies and poor inter-agency collaboration were identified as significant constraints. Key limitation of this study was its omission of technological infrastructure as a factor influencing the efficiency of forensic accounting. This gap justifies the current study, which seeks to examine how technological infrastructure may enhance or limit the impact of forensic accounting skills in fraud detection.

Modugu and Anyaduba (2022) examined the effect of Forensic Accounting and Financial Fraud in Nigeria. The study covered the period from 2012 to 2021. Using a survey method, data were collected through structured questionnaires administered to 120 forensic experts and analyzed using SPSS regression analysis. The study confirmed that forensic accounting plays a significant role in financial fraud detection. However, it emphasized the need for continuous training and skill development among practitioners. A major limitation of this study was the absence of analysis regarding environmental or infrastructural enablers, particularly the availability of digital tools and systems. This limitation highlights the relevance of the current study in investigating the moderating role of technological infrastructure in forensic accounting effectiveness.

Okwu and Oraka (2019) focused on the role of collaboration among agencies in improving fraud detection outcomes. The research covered the period from 2017 to 2020 and employed qualitative content analysis based on government audit reports and interviews with forensic accountants. Findings indicated that inter-agency collaboration enhances fraud detection effectiveness. However, it also revealed that limited technological capacity among public agencies frequently hampers investigative outcomes and data sharing. The study did not statistically assess the impact of technological infrastructure, which limits its empirical value in policy formulation. This limitation reinforces the need for a more quantitative approach such as the current study to examine how technological infrastructure moderates the relationship between forensic accounting skills and financial crime detection.

Udoayang and Asuquo (2021). Explored the role of ICT in fraud detection within public institutions between 2018 and 2021. Using a cross-sectional survey method, Likert-scale questionnaires were administered, and data were analyzed using Structural Equation Modeling (SEM). The results showed that ICT tools significantly enhance fraud detection efficiency when integrated with proper internal control systems. However, the study focused entirely on ICT capabilities and failed to incorporate forensic accounting skill levels or test interaction effects. This narrow focus presents an opportunity for the present study to bridge the gap by jointly assessing the interaction between forensic accounting skills and technological infrastructure on fraud detection performance.

Okoro et al. (2026) explored the forensic accounting and fraud detection techniques within Nigerian deposit money banks. At 91.6% correlation coefficient, they analyzed data from 81 respondents. The results indicated that forensic accounting techniques significantly reduce financial fraud in Nigeria. This study highlights that specialized tools (86.9% correlation) and professional expertise (59.9% correlation) as crucial and superior alternatives to traditional auditing. The study indicates sectoral gap limited to the private sector.

### *2.3 Theoretical Review*

Resource-Based View (RBV)

The Resource-Based View (RBV) was propounded by Jay Barney in 1991. This theory provides a strategic framework that emphasizes the significance of an organization's internal resources and capabilities in achieving and sustaining a competitive advantage. According to the RBV, for a resource to confer competitive advantage, it must meet four critical criteria: it must be valuable, rare, inimitable, and non-substitutable collectively referred to as the VRIN attributes.

The RBV asserts that organizations possessing unique and superior resources are more likely to outperform others, particularly when these resources are efficiently deployed and strategically aligned with organizational goals. In this context, resources can be tangible (technology and equipment) or intangible (skills, expertise, and intellectual capital). The theory thus views competencies such as knowledge, innovation, and technical expertise as critical determinants of performance.

In relation to the current study, forensic accounting skills comprising IT and data analytics skills, accounting and auditing expertise, and legal knowledge are conceptualized as strategic, intangible resources. These competencies, when effectively mobilized, can significantly enhance fraud detection capabilities in public sector institutions such as Nigeria's Federal Ministry of Finance. However, the RBV alone does not account for the influence of external or technological conditions that may impact the utility of these skills. In this study, technological infrastructure is proposed as a moderating factor that can either enhance or impede the practical application of forensic accounting competencies.

Despite its strengths, the RBV has certain limitations. It has been criticized for its inward-looking perspective, which tends to neglect external environmental dynamics, such as regulatory pressures, technological change, or inter-organizational collaboration. Additionally, its static orientation limits its applicability in fast-evolving sectors where adaptability and external responsiveness are vital. It is noted that other theories, such as the fraud detection triangle and heptagon (Novita et al., 2025) in fraud reporting have been promoted.

Nevertheless, the RBV remains a foundational theory for this study, offering critical insights into how internal resources specifically forensic accounting skills can be leveraged for superior organizational outcomes. The incorporation of technological infrastructure as a moderating variable addresses the RBV's limitation by linking internal capabilities with external technological enablers. This approach enables a more holistic understanding of the conditions under which forensic accounting skills are most effective in detecting financial crimes in Nigeria's public financial management system.

## 3 RESEARCH METHODOLOGY

This study adopted a survey research design, which is well-suited for examining perceptions, relationships, and patterns across a broad population. The design is appropriate for assessing the influence of forensic accounting skills on financial crime detection and allows for the generation of empirical, predictive insights. To strengthen the robustness of the analysis, the study employed a mixed-method approach, integrating both qualitative and quantitative elements. While the initial data were largely qualitative, they were transformed into quantitative form to facilitate statistical modeling and interpretation. The target population consisted of 2,200 professionals across various functional departments, including accounting, finance, internal auditing, legal services, and procurement within selected Ministries, Departments, and Agencies (MDAs) in Nigeria. These individuals were chosen based on their professional expertise and presumed involvement or familiarity with financial crime detection procedures and forensic accounting activities. A comprehensive list of the selected MDAs and the distribution of administered questionnaires is provided in Appendix B. To determine the appropriate sample size, Taro Yamane's formula for finite population sampling was applied to ensure statistical representation and reliability of results (Yamane, 1967). The formula is stated as:

n = N / [1 + N(e)^2]

Where:

n = sample size
N = population size (2,200)
e = margin of error (0.05)
1 = constant

Substituting into the formula:

n = 2,200 / [1 + 2,200(0.05) ^2] = 2,200 / 6.5 ≈ 338.46

To enhance the reliability of the study and account for possible non-response, the sample size was adjusted upward to 380 respondents. The study employed a stratified random sampling technique, which ensured proportionate representation from different departments (strata) within the MDAs. This method enhanced the precision of estimates and reduced potential sampling bias. Primary data were collected using a structured questionnaire, designed to capture key constructs such as forensic accounting skills (IT and data analytics, auditing, and legal knowledge), technological infrastructure, and financial crime detection outcomes. The questionnaire used a five-point Likert scale ranging from: Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D), and Strongly Disagree (SD).

To ensure instrument reliability, a pilot study was conducted on a sample outside the final population. The internal consistency of the questionnaire was tested using Cronbach's Alpha, a widely accepted measure of scale reliability. According to Ogbo (2019), a Cronbach's Alpha value of 0.70 or higher is considered acceptable. All constructs in this study achieved reliability scores above this threshold. Data were analyzed using a combination of descriptive and inferential statistical techniques. Descriptive statistics (e.g., frequency, mean, percentages) were used to summarize demographic characteristics. To test the hypotheses and examine relationships among variables, the study employed Ordinary Least Squares (OLS) multiple regression analysis.

Model Specification

The relationship between forensic accounting skills (independent variables), financial crime detection (dependent variable), and technological infrastructure (moderating variable) was estimated using a balanced cross-sectional multiple regression model. The general form of the model is specified as follows:

$$FCD = \beta_0 + \beta_1 ITDS + \beta_2 AAS + \beta_3 LKS + \beta_4 TI + \beta_5 (ITDS \cdot TI) + \beta_6 (AAS \cdot TI) + \beta_7 (LKS \cdot TI) + \varepsilon$$

Where:

FCD = Financial Crime Detection
ITDS = IT and Data Analytics Skills
AAS = Accounting and Auditing Skills
LKS = Legal Knowledge Skills
TI = Technological Infrastructure
$\beta_0$ = Constant term- $\beta_1$–$\beta_7$ = Coefficients of the independent and interaction terms
$\varepsilon$ = Error term.

## 4 RESULTS AND DISCUSSION

### *4.1 Results*

The study analyzed how Technological Infrastructure moderate the relationship between forensic accounting skills (IT and data analytics, accounting and auditing, legal knowledge) and influence financial crime detection in Nigeria's Federal Ministry of Finance and its agencies

### *4.2 Data Presentation and Analysis*

Table 1: Questionnaire Distribution to Respondents and Retrieval

| Questionnaire Copies | Frequency | Percentage % |
|---|---|---|
| Administered | 380 | 100 |
| Returned | 365 | 96 |
| Bad / incorrectly filled copies/ non-returned | 15 | 15 |

**Source:** Survey Data, 2026.

A total of 380 questionnaires were administered to respondents across selected Ministries, Departments, and Agencies (MDAs). Out of this number, 365 were properly completed and returned, representing a 96% response rate, which is considered highly acceptable for survey-based research. Only 15 questionnaires (4%) were either not returned or were excluded due to improper or incomplete responses. This high return rate enhances the reliability and generalizability of the findings, as it reflects strong participation and cooperation from the target respondents.

Descriptive Statistics

| | N Statistic | Minimum Statistic | Maximum Statistic | Mean Statistic | Deviation Statistic | Skewness Statistic | Kurtosis Statistic |
|---|---|---|---|---|---|---|---|
| **FCD** | 365 | 1.400 | 5.000 | 3.85685 | .939238 | 2.773 | 7.343 |
| **ITDS** | 365 | 1.800 | 5.000 | 3.57360 | .803890 | 2.379 | 6.871 |
| **AAS** | 365 | 2.200 | 5.000 | 3.70660 | .602552 | 2.458 | 8.355 |
| **LKS** | 365 | 2.400 | 4.800 | 3.79289 | .452826 | 2.446 | 4.224 |
| **TI** | 365 | 2.000 | 4.800 | 3.87513 | .547388 | 3.524 | 6.038 |

**Source:** SPSS 23 Outputs

All variables have mean values above 3.5 on a 5-point scale, indicating a general agreement among respondents that forensic accounting skills and technological infrastructure positively influence financial crime detection in the ministry. The standard deviations are moderate to low (ranging from 0.453 to 0.939), implying that responses were fairly consistent, especially for Legal Knowledge Skills (LKS) and Technological Infrastructure (TI).

All variables show positive skewness, suggesting that more respondents scored above the average. However, Technological Infrastructure (3.524) and Financial Crime Detection (2.773) are more heavily skewed, indicating a strong right-tail distribution. All variables display high kurtosis values, particularly for Accounting and Auditing Skills (8.355) and Financial Crime Detection (7.343). This implies a leptokurtic distribution, where values are heavily concentrated around the mean, showing less variability and more peaked distributions than a normal curve.

The descriptive statistics reveal a strong consensus among respondents about the relevance and availability of forensic accounting skills and technological support in financial crime detection. However, the high skewness and kurtosis values suggest non-normality, which may influence the choice of analytical techniques and require diagnostic checks before inferential analysis.

### *4.3 Regression Analysis*

The multiple regression analysis was conducted to examine the direct effects of forensic accounting skills (IT and data analytics skills, accounting and auditing skills, and legal knowledge skills) and the moderating effect of technological infrastructure on financial crime detection in Nigeria's Federal Ministry of Finance and its agencies.

Regression Analysis

| Variables | Coefficients | T-Values | P-Values |
|---|---|---|---|
| **Constants** | 2.79 | 5.432 | 0.021 |
| **ITDS** | 1.79 | 8.635 | 0.013 |
| **AAS** | 4.04 | 3.353 | 0.024 |
| **LKS** | .144 | 2.243 | 0.012 |
| **TI*ITDS** | .324 | 3,746 | 0.000 |
| **TI*AAS** | .345 | 4.786 | 0.002 |
| **TI*LKS** | .467 | 3.678 | 0.003 |
| $R^2$ | | | 0.634 |
| Adj. $R^2$ | | | 0.682 |
| F-Stat. | | | 60.543 |
| F- Sig | | | 0.00 |

**Source:** SPSS 23 Outputs

The regression model is statistically significant at the 1% level ($F = 60.543$, $p < 0.001$), indicating that the combined influence of the independent and moderating variables explains a substantial proportion of the variance in the dependent variable, financial crime detection (FCD). The $R^2$ value of 0.634 shows that approximately 63.4% of the variation in financial crime detection is explained by the model, while the adjusted $R^2$ of 0.682 confirms a strong model fit after adjusting for degrees of freedom.
IT and Data Analytics Skills (ITDS) show a statistically significant positive effect on financial crime detection ($\beta = 1.790$, $p = 0.013$). This implies that respondents with higher data analytics capabilities are more likely to contribute effectively to detecting financial crimes. Accounting and Auditing Skills (AAS) are also statistically significant ($\beta = 4.040$, $p = 0.024$), suggesting a strong association between core accounting competencies and effective fraud detection.

Legal Knowledge Skills (LKS) contribute positively and significantly to financial crime detection ($\beta = 0.144$, $p = 0.012$), highlighting the importance of legal expertise in ensuring that fraud investigations are procedurally sound and legally admissible. The interaction terms between technological infrastructure and the three skill components are all statistically significant, indicating a clear moderating effect. The interaction between ITDS and TI ($\beta = 0.324$, $p = 0.000$) suggests that the effectiveness of data analytics skills is enhanced when supported by strong technological infrastructure. The interaction between AAS and TI ($\beta = 0.345$, $p = 0.002$) further demonstrates that accounting skills are more impactful in fraud detection when digital audit tools and IT systems are available.

Similarly, the interaction between LKS and TI ($\beta = 0.467$, $p = 0.003$) indicates that legal knowledge is more effectively applied when supported by digital forensic tools such as case tracking systems and evidence management software.
The regression results support the hypothesis that forensic accounting skills significantly influence financial crime detection. More importantly, the study confirms that technological infrastructure plays a moderating role, enhancing the effectiveness of forensic skills in fraud investigation and detection processes. These findings suggest that efforts to improve financial oversight in public institutions like the Federal Ministry of Finance should not only focus on professional skill development but also on digital capacity-building and infrastructure investment.

### *4.4 Test of Hypotheses*

This section presents the results of the hypotheses tested using multiple regression analysis. The significance of the regression coefficients was evaluated at the 5% level ($p < 0.05$). The decision to reject or retain each null hypothesis was based on the computed p-values, with conclusions drawn accordingly.

Hypothesis One ($H_{01}$). IT and Data Analytics Skills have no significant effect on Financial Crime Detection.
The regression analysis produced a coefficient ($\beta$) of 1.790, with a t-value of 8.635 and a p-value of 0.013. Given that the p-value is less than the significance threshold of 0.05, the null hypothesis is rejected. It is concluded that IT and Data Analytics Skills have a significant positive effect on financial crime detection in Nigeria's Federal Ministry of Finance and its agencies.

Hypothesis Two ($H_{02}$). Accounting and Auditing Skills have no significant effect on Financial Crime Detection.

The result yielded a coefficient (β) of 4.040, a t-value of 3.353, and a p-value of 0.024. Since the p-value is less than 0.05, the null hypothesis is rejected. It is concluded that Accounting and Auditing Skills have a statistically significant and positive influence on financial crime detection.

Hypothesis Three ($H_{03}$). Legal Knowledge Skills have no significant effect on Financial Crime Detection.
The regression output shows a coefficient (β) of 0.144, with a t-value of 2.243 and a p-value of 0.012. As the p-value is below 0.05, the null hypothesis is rejected. It is concluded that Legal Knowledge Skills contribute significantly and positively to the detection of financial crimes in public sector institutions.

Hypothesis Four ($H_{04}$). Technological Infrastructure does not significantly moderate the relationship between IT and Data Analytics Skills and Financial Crime Detection.
The interaction term between ITDS and Technological Infrastructure produced a coefficient (β) of 0.324, with a t-value of 3.746 and a p-value of 0.000. The p-value is highly significant; therefore, the null hypothesis is rejected. It is concluded that Technological Infrastructure significantly moderates the relationship between IT and Data Analytics Skills and financial crime detection.

Hypothesis Five ($H_{05}$). Technological Infrastructure does not significantly moderate the relationship between Accounting and Auditing Skills and Financial Crime Detection.
The coefficient for the interaction term was 0.345, with a t-value of 4.786 and a p-value of 0.002. As the p-value is below the 0.05 threshold, the null hypothesis is rejected. It is concluded that Technological Infrastructure positively moderates the relationship between Accounting and Auditing Skills and financial crime detection.
Hypothesis Six ($H_{06}$). Technological Infrastructure does not significantly moderate the relationship between Legal Knowledge Skills and Financial Crime Detection.
The regression result showed a coefficient (β) of 0.467, a t-value of 3.678, and a p-value of 0.003. Since the p-value is less than 0.05, the null hypothesis is rejected. It is concluded that Technological Infrastructure has a significant moderating effect on the relationship between Legal Knowledge Skills and financial crime detection.

### *4.5 Discussions*

The major findings of this study are presented below, along with scholarly literature that supports or contrasts each outcome.
The analysis revealed that IT and Data Analytics Skills have a statistically significant positive effect on financial crime detection. This suggests that forensic accountants who utilize tools such as Computer-Assisted Audit Techniques (CAATs), big data analytics, and data visualization software are more effective at identifying and investigating suspicious financial activities. This finding is consistent with the work of Bierstaker et al. (2006), who observed that data analytics tools enhance fraud detection by enabling forensic professionals to analyze large datasets efficiently. ACFE (2022) also highlights the growing role of data analytics in uncovering hidden fraud patterns and improving the timeliness of investigations. Similarly, Crumbley, Heitger, and Smith (2015) emphasized the integration of IT tools in modern forensic accounting practices as a critical skill for financial crime detection. In contrast, Ijeoma (2015) argued that although IT tools are useful, their effectiveness is often limited by organizational resistance, data accessibility issues, and lack of training, particularly in developing countries like Nigeria. Thus, while the finding aligns with global best practices, it also implies that skill effectiveness may be context-dependent.

Accounting and Auditing Skills were found to significantly influence the detection of financial crime. Respondents proficient in internal control systems, auditing procedures, and financial reporting standards demonstrated higher capability in uncovering financial misstatements and anomalies. This result aligns with the findings of Okoye and Gbegi (2013), who reported that strong auditing capabilities significantly aid public sector fraud detection. Similarly, Modugu and Anyaduba (2013) confirmed that forensic accountants rely heavily on traditional auditing techniques to identify fraud red flags. DiGabriele (2011) also noted that a sound understanding of accounting principles is fundamental to forensic investigations. However, Owojori and Asaolu (2009) cautioned that auditing alone may not be sufficient in detecting more sophisticated financial crimes, which require deeper investigative and cross-functional expertise. This implies that while auditing skills are crucial, their efficacy is enhanced when combined with other forensic tools.

Legal Knowledge Skills also showed a significant, though relatively smaller, effect on financial crime detection. Knowledge of legal procedures, regulatory frameworks, and the admissibility of evidence was shown to support effective prosecution and documentation of fraud cases. This finding is supported by Singleton and Singleton (2010), who emphasized the importance of legal competence in forensic accounting to ensure that investigative findings are court-admissible. Albrecht et al. (2023) also highlighted the necessity of legal understanding for expert witnesses in fraud-related litigation. Nonetheless, Zysman (2004) noted that in some contexts, legal training is often undervalued in forensic accounting practice, with more emphasis placed on technical financial skills. This underscores the need to balance legal education with core accounting and IT competencies in anti-fraud strategies.

The study found that Technological Infrastructure significantly moderates the relationships between all three forensic skill components (ITDS, AAS, and LKS) and financial crime detection. This implies that the effectiveness of these skills is enhanced in institutions with access to modern audit software, secure digital records, and robust forensic systems. This finding is in strong agreement with Olaoye and Olanipekun (2020), who asserted that weak digital systems in Nigerian MDAs hinder the full potential of forensic audits. Udoayang and Asuquo (2022) also emphasized the role of ICT infrastructure in improving fraud detection through automation, real-time monitoring, and data integration. Conversely, Nwaiwu and Aaron (2023) noted that while digital infrastructure is important, organizational culture, inter-agency coordination, and governance ethics are equally critical in enabling forensic effectiveness. Thus, while this study confirms the importance of IT systems, it also highlights the need for institutional alignment and policy support.

The findings collectively underscore that forensic accounting competencies significantly contribute to financial crime detection when supported by enabling technological infrastructure. The results are broadly consistent with previous research but also bring new insights by empirically validating moderation effects, which have often been conceptually discussed but rarely tested in Nigerian public sector contexts.

## 5 CONCLUSIONAND RECOMMENDATION

### *5.1 Conclusion*

This study investigated the moderating effect of technological infrastructure on the relationship between forensic accounting skills specifically IT and data analytics skills, accounting and auditing skills, and legal knowledge skills and financial crime detection in Nigeria's Federal Ministry of Finance and its agencies. The empirical results revealed that all three categories of forensic accounting skills have a statistically significant and positive effect on financial crime detection. Notably, IT and data analytics skills had the strongest impact, followed by accounting and auditing skills, and then legal knowledge skills. Furthermore, the study established that technological infrastructure significantly moderates each of these relationships, enhancing the effectiveness of forensic professionals when robust digital systems are in place.

These findings align with global and national literature, confirming that technological readiness and forensic competence are complementary in combating financial crimes in public institutions. However, disparities in training, access to digital tools, and regulatory enforcement still pose challenges to full-scale effectiveness. The study concludes that strengthening both forensic accounting capacity and IT infrastructure is critical to improving fraud detection, enhancing transparency, and ensuring accountability in Nigeria's public financial system.

### *5.2. Recommendations*

Based on the findings and conclusions of this research, the following recommendations are proposed.

i. Invest in Technological Infrastructure Across MDAs. Government agencies should allocate dedicated funding for acquiring forensic software tools, secure databases, and real-time transaction monitoring systems. This will enhance the application of forensic skills in detecting and investigating financial crimes.
ii. Mandatory Forensic Accounting Training. Regular and compulsory training programs should be organized for personnel in accounting, audit, procurement, and legal departments, with emphasis on IT-based forensic techniques, data analytics, and fraud detection.

iii. Strengthen Legal Frameworks and Expertise. Legal departments within MDAs should receive specialized training in financial crimes, evidence management, and litigation support to enhance the prosecution of fraud cases. Legal professionals should work collaboratively with forensic teams to ensure case admissibility.

iv. Integrate Forensic Audit Units into Organizational Structures. MDAs should establish or empower in-house forensic audit units with cross-functional teams to conduct periodic fraud risk assessments, internal investigations, and compliance reviews.

v. Develop a Centralized Fraud Monitoring Platform. A centralized forensic information system should be developed and managed by the Office of the Accountant-General or Ministry of Finance to allow for real-time monitoring, red flag alerts, and case tracking across MDAs.

vi. Policy Alignment and Oversight by Anti-Graft Agencies. Institutions such as the EFCC, ICPC, and Auditor-General's Office should develop joint operational frameworks with MDAs to align forensic investigations with broader anti-corruption goals, while promoting inter-agency collaboration and oversight.

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