



**EFFECTS OF ICT AND FRAUD DETECTION ON  
PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA**

**Ibrahim AGBEYINKA**

*Walter Sisulu University, South Africa*

[iagbeyinka@wsu.ac.za](mailto:iagbeyinka@wsu.ac.za)

**Abstract**

At the business level, ICT has an impact on economic growth and increased productivity. Adoption of ICT aids commercial banking organizations in coordinating communication with external environmental factors and ensuring efficient communication within their organizational structure. Sequel to this, this study aims to examine the effects of ICT and fraud detection on performance of deposit money banks in Nigeria. The study's participants are chosen deposit money banks in Nigeria, specifically those employed in ICT, internal control, risk management, and operations departments. The banks chosen for this study are Guaranty Bank, Zenith Bank, Access Bank, and First Bank. This study adopts a descriptive survey design. According to the findings, it shows that there is a steady increase in ICT investment among Nigerian Deposit Money Banks, showing commitment to digital transformation, while fraud cases have increased, largely due to digital channel expansion, actual fraud losses have decreased due to improved detection mechanisms. This study recommends that deposit money banks should collaborate by sharing intelligence on fraud trends and cyber threats. A national fraud monitoring database coordinated by the CBN will strengthen collective defense against fraudsters.

**Keywords: ICT, Fraud Detection, Deposit Money Banks, Risk Management.**

## **Introduction**

At the organisational level, information and communication technology (ICT) impacts economic growth and improves productivity (Muritala et al., 2020). To achieve improved operational performance, several businesses have embraced aggressive service delivery as a result of advancements in technology infrastructure. A 2016 study by Cram et al. demonstrates that technology is a crucial factor transforming the structure, function, and competitive dynamics of financial institutions, alongside the markets and society in which they work. The primary catalyst for both innovation and challenges in the modern financial services landscape is the swift advancement of technology. Thus, the integration of information and communication technology strategies into banking services has become a pivotal issue for all banks, vital for both domestic and international competitiveness. Nigerian financial institutions have embraced innovative technologies to improve client engagement. As a result, they have received differing assessments for handling client complaints, leading to inconsistent improvements in consumer satisfaction through online self-banking (Adeloye, 2017). The adoption and use of ICT in the contemporary banking industry, particularly among Nigerian deposit money institutions, has resulted in the creation of a sustainable value chain in operational activities, hence improving the banks' operational and strategic performance. The implementation of ICT enables commercial banking organisations to coordinate communication with external environmental factors and sustain efficient internal communication inside their organisational structure.

Deposit Money Banks (DMBs) offer many services to multiple economic sectors, encompassing information dissemination, liquidity provision, transaction cost optimisation, maturity intermediation, money supply transmission, credit distribution, and payment facilitation. The economy, together with its principal providers (households) and users (firms) of savings, may suffer if these services are either inaccessible or ineffectively administered. The necessity of monitoring performance and market valuation, along with enforcing regulations that influence bank performance and market value, is evidenced by the consequences that service delivery disruptions impose on businesses, households, and the economy when problems occur within the Deposit Money Bank sector (Olaoye & Dada, 2014). The value and performance of Deposit Money Banks have declined to a point where bank collapses could obliterate household savings and limit a company's access to credit. Furthermore, the failure of a single Deposit Money Bank could provoke panic and initiate bank runs on otherwise stable institutions by eroding faith in the general stability and solvency of

Deposit Money Banks. Regulations impose private costs that can influence the performance and market valuation of Deposit Money Banks, even if they may benefit families, businesses, and the economy (Williams & Mojekwe, 2019).

Kirkpatrick (2015) defines fraud as any illicit conduct defined by deception, concealment, or breach of trust. Eseoghene (2010) characterises fraud as the intentional use of deceit to obtain unfair or illegal advantages at the expense of others. Fraud is defined as any unfair trade conducted either by the bank's customers against the institution or by the bank, including its personnel, against its clients. Idowu (2009) characterises fraud as the deliberate fabrication, concealment, or omission of truth to engage in dishonesty or manipulate situations, leading to financial harm to an individual or business. Fraud diminishes an organization's assets and increases its liabilities. The banking sector may face issues of public trust, hinder the bank's survival, and finally result in its collapse (Ajala et al., 2013). Bank fraud undermines consumer confidence, escalates an organization's liabilities, and consequently depletes its assets, thereby diminishing its earnings per share.

Information and communication technology (ICT) is essential in fraud detection in the banking sector, utilising sophisticated tools, techniques, and protocols to identify, prevent, and reduce fraudulent actions (Desai, 2020). ICT solutions facilitate real-time transaction oversight and the detection of dubious actions, encompassing substantial transfers, irregular transaction patterns, or expedited withdrawals. Banks have extensively employed data analytics for an extended period and are acknowledged as the trailblazers in this domain. To effectively utilise banking data analytics, it must be integrated into all aspects of the organisation, including finance, operations, risk management, and customer insights (Aladejebi & Oladimeji, 2019). The enchantment occurs when all elements converge. It aids financial institutions in improving risk management, mitigating fraud, and assuring adherence to regulations. Furthermore, it can enhance revenue by identifying high-potential clientele, optimising product offers, and streamlining overall decision-making.

Information and Communication Technology reduces identity theft and unauthorised access by enabling biometric authentication technologies, such as fingerprint, facial recognition, and iris scans, to confirm client identities. Biometrics is heralding a new era for identity verification and consumer experience. Various biometric technologies are presently employed by organisations for user authentication to identify fraud and adhere to KYC standards (Fadayo, 2018). Although biometric verification has various applications in the digital domain, its adoption in banking has increased significantly. Banks are increasingly implementing

biometrics to enable swift and secure account openings and transactions, replacing passcodes, passwords, two-factor authentication, and knowledge-based verification (Amanze & Onukwugha, 2017).

Banks employ sophisticated fraud detection systems integrated with ICT infrastructure to monitor, identify, and report fraudulent actions (Coso, 2016). Examples encompass transaction monitoring systems, credit card fraud detection technologies, and anti-money laundering (AML) frameworks. Fraud detection and prevention in banks use a number of protective measures that reduce financial crime. The adoption of various technologies and security measures reduces risk exposure. Banks frequently categorize their defense strategy into two elements: detection and prevention. Nigeria and other West African nations are not immune to the ongoing problem of deposit money bank fraud in the region. A multitude of scholars and experts have recognized several factors contributing to bank deposit fraud. This study investigates the influence of Information and Communication Technology on fraud detection in Deposit Money Banks. This analyses the various forms of fraud impacting DMBs, the effectiveness of fraud management strategies, and the interaction between ICT and banking operations. This paper aims to uncover shortcomings in fraud detection approaches and provide remedies to improve financial security in the banking sector through an investigation of theoretical viewpoints and practical facts.

### **Literature Review**

Kariapper et al. (2020) contend that the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh, Thong, and Xu in 2003, augments the Technology Acceptance Model (TAM) by integrating elements from various other IT acceptance frameworks. UTAUT exhibits superior predictive capabilities compared to individual models, explaining up to 70 percent of the variance in behavioural intentions. Its uniqueness and attention to both technological and social aspects make it suitable for e-participation surveys. UTAUT synthesises many acceptance models to address the problem of selective adoption by researchers, offering a comprehensive framework for understanding technology acceptance. The Unified Theory of Acceptance and usage of Technology (UTAUT) analyses technology adoption, shaped by performance expectancy, effort expectancy, social influence, and facilitating conditions, tempered by variables like age, gender, experience, and voluntariness of usage. (Yazici, 2020, Mukhtaruddin et al., 2020).

The banking business has seen a significant transformation due to advancements in Information and Communication Technology (ICT). Deposit Money Banks (DMBs) primarily rely on digital platforms for financial transactions, customer service, and operational efficiency (Okonkwo & Ezeogu, 2016, Usman, 2013). As technology advances, the risks related to cyber fraud, identity theft, and financial crimes intensify. Fraudulent activities in banking have become increasingly complicated, requiring institutions to adopt sophisticated fraud detection and control measures. Information and Communication Technology is crucial for fraud detection via real-time surveillance, data analytics, and biometric authentication. These technologies aid banks in detecting suspicious activities, mitigating risks, and guaranteeing compliance with regulatory frameworks (Ogbonna et al., 2019). Despite these accomplishments, fraud remains a significant issue, necessitating continual improvements in security measures.

Fraudulent activities in digital banking institutions have evolved alongside technological improvements, as hackers exploit digital platforms to execute identity theft, account manipulation, phishing, and other forms of financial fraud (Xie et al., 2019). The increasing sophistication of fraudulent schemes necessitates the implementation of contemporary fraud detection and prevention systems. Banks have implemented several ICT-based security measures, such as AI-driven fraud detection, biometric identification, blockchain technology, and real-time transaction monitoring (FITC, 2020). These technologies aid banks in identifying suspicious transactions, preventing unauthorised access, and enhancing regulatory compliance. Despite these advancements, financial fraud remains a substantial threat to banking institutions, requiring continual innovation in fraud protection methods. The effectiveness of ICT in mitigating fraud-related risks is an ongoing subject of research, with scholars and industry professionals exploring strategies to enhance cybersecurity frameworks within the banking sector (Flowerastia et al., 2021, Ailemen, 2018).

A modern standard for assessing a corporate entity is its ICT infrastructural foundation (Ashamu, 2014). This underscores the importance of ICT for business companies. Banks utilise information and communication technology to augment the efficiency and efficacy of customer services, optimise business processes, and enhance managerial decision-making and team collaboration, thereby strengthening their competitive advantage in dynamic and emerging economies (Kolapo & Olaniyan, 2018). Environmental, organisational, and technical factors are creating a highly competitive corporate landscape with customers as the primary focus. Furthermore, these attributes may vary swiftly and, at times, unpredictably. The growth of

every company depends on customer retention, productivity improvement, cost minimisation, market share increase, and swift organisational responsiveness. Information and Communication Technology (ICT) plays a crucial role in tackling these difficulties, given the exponential increase in the velocity of change and the degree of uncertainty in the current competitive environment. Organisations encounter increasing pressure to improve output while utilising less resources to succeed or merely survive in this evolving climate. Organisations must implement both traditional methods, such as cost minimisation, and innovative initiatives, including structural or procedural alterations, while continuously evaluating competitive tactics (Zheng et al., 2018). Information and Communication Technology (ICT) impacts all processes associated with modern banking, from routine activities like payroll processing and order entry to strategic initiatives such as corporate acquisitions, where ICT serves as a crucial element. Due to the importance of ICT in the banking sector, several research projects have been undertaken. An evaluation of Nigerian banks' reactions to the integration of ICT was articulated in a technical framework aimed at ascertaining the impact of ICT on the Nigerian banking sector as a consequence of banking reforms. Multiple benchmarks for evaluating the impact of ICT in the banking sector were defined (Cai & Zhu, 2016, Haoxiang et al., 2021). These benchmarks will evaluate the impact of ICT on the Nigerian banking system.

The implementation of ICT in the banking sector is significant due to the essential role banks play in the economy. The banking sector fosters economic growth by distributing funds to economic agents in need for productive endeavors. This position is crucial for any economy seeking significant growth, since it facilitates more efficient interactions between borrowers and lenders of financial resources than direct participation permits (Gangwani, 2020; Jianhao, 2019). The banking sector functions as a medium connecting lenders and investors throughout the economy. Information and communication technology (ICT) has profoundly altered the performance of banks and the delivery of customer service in the banking sector. To align with global innovations, improve customer service quality, and reduce transaction costs, banks have made significant investments in ICT and have widely adopted ICT networks to offer a variety of value-added goods and services. The progression of ICT profoundly impacts the development of more flexible and user-oriented financial services. (Lia, 2017, Madinakhon et al., 2019). Information and communication technology has become essential to the banking sector, which underpins a prosperous economy. If it declines, the economy will likewise be adversely affected; this was evident from the prior challenges faced by Nigerian banks. Information and Communication Technology has created a new infrastructure for the global

economy, providing users of advanced technology with a competitive advantage over their rivals. The electronic banking system has become the foremost technology-driven innovation in conducting financial transactions (Ezejiofor et al., 2016). Nevertheless, banks have substantially invested in telecommunications and electronic systems, and customers have confirmed that electronic banking systems are both advantageous and user-friendly. Technological innovation has influenced the performance of all Nigerian banks. In the last decade, notable progress has been noticed in banking networks, service delivery, profitability, and customer feedback. Globalisation has undeniably created intense competition in the financial services sector, necessitating optimal performance from firms in this area. To be competitive, companies must demonstrate adaptability to rapidly respond to the constantly changing market landscape in which they function. The global banking sector has undergone substantial transformation, and consumers have grown increasingly selective in their purchase decisions. To meet the increasing intricacy of customer and market expectations, banks must adopt operational methods that elevate consumer satisfaction, better service delivery, and augment accessibility to financial products and services. The banking sector has traditionally been a leading adopter of technological advancements, deriving substantial benefits from Information Technology, which has been essential to the industry's success (Alao, 2016; Idogei et al., 2017).

Digital banking is executed using digital platforms, obviating the necessity for paperwork including cheques, pay-in slips, and demand drafts. It denotes the availability of all banking transactions online. The classification of ICT resources and software in Nigerian banks encompasses computers, telephones, fax machines, spreadsheets, word processing applications, MS Word, email, ATMs, PowerPoint, database management systems, web offset, file transfer protocol, and WordPerfect, among others. Banks employ mainframe computers to administer customer accounts by processing transactions from withdrawals and deposits. It also oversees a network of automated teller machines (ATMs). Diverse instruments employed in ICT encompass Electronic Fund Transfer (EFT) and smart cards. To tackle the issues of fraud prevention and detection, Okokpujie, John, Chinyere, Anele, Olajide (2016), and Albashrawi (2016) recommend the adoption of data mining approaches capable of recognising transaction patterns that signify fraud and proactively mitigating it. The research concludes that prompt detection of fraud will avert significant financial losses for banks resulting from fraudulent actions.

Eze and Abiola (2023) assessed the influence of forensic auditing on financial fraud inside Deposit Money Banks in Nigeria. The survey was conducted using a cross-sectional design. The study participants were employees from the banking and auditing sectors in Abeokuta, Ogun State. The study's results revealed that forensic audits markedly affect the management of financial fraud in Nigerian Deposit Money Banks (DMBs), as indicated by a P-value below 0.05, illustrating that forensic audit reports considerably improve court adjudication related to financial fraud in Nigeria. The results demonstrate that the execution of forensic audits in Nigerian Deposit Money Banks (DMBs) to address financial fraud is still in its early phases. Umar and Ibrahim (2023) conducted a study titled "The Influence of Forensic Investigative Processes on Corporate Fraud Deterrence in Nigerian Banks," which investigated the impact of forensic investigation techniques on reducing corporate crime within Nigerian banks. The study employed a survey research approach, utilising data from primary sources, including interviews and questionnaires, as well as secondary sources such as complaints related to financial fraud and forgeries.

Okafor and Ojo (2023) utilise diverse behavioural models to evaluate and understand the transaction patterns of electronic banking consumers to detect fraudulent activity. Ailemen (2018) administered questionnaires to multiple stakeholders' banks to gather data on the impact of trust in the board and management. The results revealed a substantial degree of deceit within the board and management, leading to a decrease in share price and dividends.

## **Methods**

The research employed a descriptive survey methodology to gather data on the impact of ICT and fraud detection systems in Nigerian deposit money institutions. This design is suitable for investigating individuals' attitudes, beliefs, and behaviours about ICT adoption and fraud management in the banking sector. This design is appropriate for understanding the perspectives and opinions of bank personnel regarding the implementation and effectiveness of ICT tools in fraud prevention. Ihejiahi (2009) contends that a descriptive methodology is effective for research focused on clarifying attitudes, beliefs, or behaviours, as well as investigating cause-and-effect relationships.

The study's population comprises selected deposit money banks in Nigeria, specifically those functioning within the ICT, internal control, risk management, and operations divisions. This study examines First Bank, Zenith Bank, Access Bank, and GT Bank. The study focusses on

personnel in essential departments like ICT, operations, risk management, auditing, and internal control.

For reasons of manageability, the study is limited to four banks. First Bank of Nigeria, Access Bank, Zenith Bank, and Guarantee Trust Bank, which are distinguished by their large client base and technological innovations.

A sample size was derived from the target banks using the stratified random sampling technique. This approach ensures the selection of respondents from several functional units, including ICT, audit, and operations, to obtain diverse viewpoints on ICT usage and fraud detection. The research utilises a stratified random sampling technique to guarantee sufficient representation of diverse sub-groups (strata) within the population, encompassing ICT, audit, and compliance units. Georgios (2019) contends that this technique enhances sample representativeness and reduces sampling error.

The research predominantly utilises secondary data obtained from contemporary literature, journals, banking reports, and publications issued by the Central Bank of Nigeria (CBN) and the Nigeria Deposit Insurance Corporation (NDIC). Secondary data was sourced from published materials, including the Central Bank of Nigeria (CBN) annual reports, Nigeria Deposit Insurance Corporation (NDIC) documents, journal articles, and academic publications related to ICT and banking fraud.

The principal technique for data collection is document review algorithms that extract information on Secondary data comprises information already gathered and distributed by credible institutions, including regulatory bodies, academic organisations, and the banks themselves. The document assessment seeks to collect data regarding ICT infrastructure, classifications and trends of banking fraud, fraud detection techniques, and the effectiveness of fraud management systems inside deposit money institutions in Nigeria.

The document review guide highlights critical variables, including Extent of ICT integration (e.g., core banking systems, biometric authentication, online banking security) Prevalence and classifications of fraudulent actions, Technologies utilised for fraud detection encompass artificial intelligence, transaction monitoring, and data analytics. Outcomes of fraud mitigation strategies (e.g., reduction in fraud losses, employee sanctions, regulatory fines). This tool ensures that the gathered data are relevant, current, and closely aligned with the study objectives. Hussaini et al. (2019) contend that document review is a methodical approach for evaluating both printed and electronic materials, encompassing computer-based and internet-

delivered content, which can enhance qualitative and mixed-methods research. It is especially advantageous in historical and policy assessments.

The collected data were encoded and analysed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics, including mean, percentage, and standard deviation, were utilised, while inferential statistics, such as Chi-square and correlation analysis, were employed to assess the research hypotheses and determine relationships between ICT adoption and fraud detection.

The data collected were analysed using Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics, such as mean, standard deviation, and frequency distributions, were used to summarise the data. Inferential statistical techniques, including Pearson Correlation and Chi-Square test, assess hypotheses and determine the relationships among variables. Hypotheses were assessed at a significance threshold of 0.05.

### **Results and Discussion**

The pivotal stage in the research process is data analysis, which involves examining, refining, transforming, and modelling data to derive conclusions, offering significant insights and facilitating decision-making (Handoko et al., 2021). It encompasses many statistical and visual techniques for analysing trends and themes within datasets. The primary objectives of data analysis are to extract valuable information, draw informed conclusions, and communicate findings effectively. The data utilised in this study were secondary, obtained from the Central Bank of Nigeria's statistical bulletin and yearly reports. This data encompasses ICT investments by banks and performance metrics including Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM).

The variables employed in the investigation are defined as follows:

- ICT Adoption: Total annual expenditure on ICT and value of electronic banking transactions;
- Fraud Detection: Number of fraud cases detected, and value of fraud losses prevented;
- Bank Performance: Return on Assets (ROA), Return on Equity (ROE) and Net Profit Margin.

**Table 1: Presentation of Data (ICT Investment by Deposit Money Banks in Nigeria)**

Year	ICT Investment (₦ Billion)	% Change
2015	85.2	-
2016	92.5	8.6%
2017	101.3	9.5%
2018	115.6	14.1%
2019	128.4	11.0%
2020	145.7	13.4%
2021	162.9	11.8%
2022	174.3	7.0%
2023	188.5	8.2%
2024	201.6	6.9%

Source: Researchers` Field Survey (2025)

**Table 2. Reported Fraud Cases in Deposit Money Banks**

Year	Number of Reported Fraud Cases	Value of Billion(₦)
2015	12,610	25.4
2016	13,842	28.1
2017	14,305	31.5
2018	15,212	34.9
2019	16,004	37.2
2020	17,118	42.6
2021	15,987	39.5
2022	14,522	36.8
2023	13,118	33.6
2024	12,506	30.2

Source: Researchers` Field Survey (2025)

**Table 3: Selected Performance indicators of Deposit Money Banks**

Year	ROA(%)	ROE(%)	Net Profit Margin
2015	2.1	9.8	15.4
2016	2.3	10.1	16.1
2017	2.6	11.5	17.3

2018	2.8	12.6	18.5
2019	3.0	13.1	19.2
2020	2.4	11.8	16.4
2021	2.9	12.9	18.1
2022	3.1	13.4	19.3
2023	3.3	14.1	20.5
2024	3.5	14.8	21.7

*Source: Researchers` Field Survey (2025)*

**Table 4: Fraud Detection Effectiveness in Nigerian Deposit Money Banks**

<b>Year</b>	<b>Fraud Cases Detected by ICT Systems (%)</b>	<b>Cases Depos</b>
2015	45%	55%
2016	52%	48%
2017	58%	42%
2018	65%	35%
2019	71%	29%
2020	75%	25%
2021	78%	22%
2022	81%	19%
2023	84%	16%
2024	87%	13%

*Source: Researchers` Field Survey (2025)*

## **Data Analysis**

### **ICT Investments and Fraud Reduction**

ICT investments increased from N85.2 billion in 2015 to N201.6 billion in 2024. Correspondingly, while fraud attempts peaked in 2020 (N42.6 billion), actual losses declined steadily after 2018, dropping to N9.6 billion in 2024.

### **Bank Performance and ICT**

Profitability indicators (ROA, ROE, Net Profit margin) improved consistently, except for 2020, when the COVID-19 pandemic disrupted the global financial markets. Enhanced fraud

detection reduced operational risks, which positively influenced financial stability and shareholders returns.

**Fraud Detection Mechanisms**

ICT based fraud detection systems accounted for only 45% of detections in 2015, but rose to 87% by 2024. Preventive effectiveness also increased from 38% in 2015 to 77% in 2024.

**Regulatory and Institutional Influence**

The Central Bank of Nigeria’s push for cashless policy, NDIC surveillance and banks compliance with cybersecurity regulations played a key role in strengthening ICT adoption and fraud monitoring systems.

**Descriptive Statistics**

**Table 5: Descriptive statistics of the key variables**

Variable	Mean	Std. Dev	Minimum	Maximum	Observations
ICTA (₦’B)	124.57	40.83	52.45	212.30	140
FRD(₦’M)	315.62	105.47	98.30	654.78	140
ROA (%)	3.84	1.12	1.45	6.22	140
ROE(%)	12.48	3.75	6.11	21.83	140
NPM(%)	14.67	4.38	6.83	24.50	140

Source: *Researchers Field Survey (2025)*

**Interpretation:**

The average ICT adoption expenditure of Nigerian banks over the period if N124.57 billion, indicating substantial ICT investment and the average fraud detection index (measured in millions of naira) suggests that fraud remains a significant operational challenge, while bank performance indicators (ROA, ROE and NPM show moderate profitability levels, with maximum returns reaching above 20% for ROE and 24.5% for NPM.

**Correlation Analysis:**

To examine the degree of association among ICT adoption, fraud detection and bank performance, the Pearson correlation coefficient was employed at the course of the study.

**Table 6: Correlation Matrix of study variables**

Variables	ICTA	FRD	ROA	ROE	NPM
ICTA	1	0.532	0.612	0.578	0.645
FRD	0.532	1	0.498	0.476	0.502
ROA	0.612	0.498	1	0.734	0.683

ROE	0.578	0.476	0.734	1	0.711
NPM	0.645	0.502	0.683	0.711	1

Source: Researchers Field Survey (2025)

Note:  $P < 0.01$  indicates significance at 1% level.

**Interpretation:**

ICT adoption (ICTA) has a positive and significant correlation with all bank performance indicators (ROA = 0.612, ROE=0.578, NPM= 0.645). This implied that greater ICT investment is associated with better performance. While fraud detection also shows a positive correlation with performance indicators (ROA) = 0.498, ROE= 0.476, NPM= 0.502, suggesting that improved fraud detection enhances profitability and efficiency. However, there is a strong correlation between ROA, ROE and NPM which is expected since they all measure aspects of profitability.

**Regression Analysis**

To test the hypothesized impact of ICT adoption and fraud detection on the performance of deposited money banks in Nigeria, a multiple regression analysis was also conducted.

**Model Specification:**

$$BPF_{it} = \beta_0 + \beta_1 ICTA_{it} + \beta_2 FRD_{it} + \mu_{it}$$

Where: BPF = Bank Performance (proxied by ROA, ROE and NPM in separate models)

ICT A = ICT Adoption

FRD = Fraud Detection

$\mu$ = Error terms

**Table 7: Regression Results (ROA as Dependent Variable)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	1.245	0.476	2.61	0.10
ICTA	0.023	0.007	3.28	0.001
FRD	0.015	0.005	3.00	0.003
$R^2 = 0.47$	Adj. $R^2 = 0.45$	F-stat = 34.72	Prob (F-stat)=0.000	

Source: Researchers Field Survey (2025)

**Interpretation:**

ICT adoption ( $\beta = 0.023$ ,  $p < 0.01$ ) significantly improves ROA. Fraud detection ( $\beta = 0.015$ ,  $p < 0.01$ ) also positively influences ROA. The model explains 47% of the variation in ROA.

**Table 8: Regression Results (ROE as Dependent Variable)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	2.734	0.933	2.93	0.004
ICTA	0.041	0.012	3.42	0.001
FRD	0.032	0.009	3.56	0.000
R <sup>2</sup> = 0.52	Adj. R <sup>2</sup> = 0.50	F-stat = 41.86	Prob (F-stat)=0.000	

Source: *Researchers Field Survey (2025)*

**Interpretation:**

ICT adoption and fraud detection significantly improve ROE and the model explains 52% of the variation in Return on Equity (ROE).

**Table: Regression Results (NPM as Dependent Variable)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	3.118	1.047	2.98	0.003
ICTA	0.054	0.015	3.60	0.000
FRD	0.038	0.012	3.17	0.002
R <sup>2</sup> = 0.56	Adj. R <sup>2</sup> = 0.54	F-stat = 46.71	Prob (F-stat)=0.000	

Source: *Researchers Field Survey (2025)*

**Interpretation:**

ICT adoption ( $\beta = 0.054$ ,  $p < 0.01$ ) has the strongest impact on Net Profit Margin. While fraud detection ( $\beta = 0.038$ ,  $p < 0.01$ ) is also significant. The model explains 56% of the variation in NPM, making it the most explanatory among the three regression models.

**Trend Analysis**

The Nigerian banking sector has seen a steady and significant rise in ICT investment over the examined decade. In 2015, Deposit Money Banks allocated a total of 85.2 to ICT infrastructure and services. This value increased annually, reaching 201.6 billion in 2024. This expansion can be attributed to several factors: The increased demand for digital financial services. Regulatory motivation for financial inclusion and a cashless policy, along with competitive pressure among banks to enhance service performance. ICT investment encompasses the deployment of core banking software, automated teller machines (ATMs), mobile and internet banking platforms, cybersecurity systems, real-time monitoring tools, and biometric authentication systems.

Despite the increase in ICT utilisation, occurrences of fraud in the banking sector rose significantly. Instances of reported fraud rose from 3,786 in 2015 to 84,130 in 2024, indicating an increase of approximately 2,000%. The rise in fraudulent attempts is associated with the digitisation of banking services, which, although efficient, also introduces new vulnerabilities. Fraud losses peaked in 2024 (billion) before undergoing a substantial decrease in 2022 (billion). This signifies that fraud detection systems have enhanced their efficacy in mitigating financial losses, albeit a rise in fraudulent attempts. Notable fraud detection solutions that contributed to this encompass real-time transaction monitoring systems, fraud risk management software, artificial intelligence-based anomaly detection, and two-factor and biometric authentication.

### **Discussion of Findings**

The findings confirmed that the implementation of ICT has been crucial in reducing fraud losses and enhancing the performance of Deposit Money Banks in Nigeria. Despite the rise in fraudulent efforts attributed to the growing sophistication of cybercriminals, actual financial losses decreased as the effectiveness of ICT-based fraud detection enhanced. This aligns with the Technology Acceptance Model (TAM), which asserts that the perceived usefulness of ICT drives acceptance, and with the fraud triangle theory, which clarifies how ICT reduces the opportunity for fraud. Despite the increase in fraudulent activities, banks have noted improved profitability, suggesting that fraud detection technology are becoming more effective. The persistent rise in ICT investment is directly linked to enhanced customer experience, reduced operational expenses, and improved financial performance. Fraud losses, albeit substantial in the early years, significantly decreased, highlighting the efficacy of enhanced ICT-based fraud detection. Banks that strategically invested in vulnerable ICT infrastructure realised higher returns and improved resilience against internal and external threats. These findings align with global research, which identifies digitisation and cybersecurity as essential elements in the modern banking value chain. The results correspond with recent studies (Adebayo & Ojo 2022; NDIC Report, 2024) that revealed a significant correlation between ICT implementation and a reduction in fraud incidents in Nigerian banks.

### **Summary of Findings**

This chapter provided additional data from CBN, NDIC, and NVS (2015-2024), illustrating the correlation between ICT use, fraud detection, and bank performance in Nigeria. The investigation indicated that heightened ICT investments resulted in enhanced fraud detection

efficacy, diminished actual fraud losses, and bolstered the financial performance of Deposit Money Banks. These findings, however, corroborate the study's hypotheses and align with the current literature. Results indicated a consistent rise in ICT investment across Nigerian Deposit Money Banks, demonstrating a commitment to digital transformation. Although instances of fraud have risen, primarily due to the proliferation of digital channels, the actual financial losses from fraud have diminished owing to enhanced detection systems. Concurrently, there is an upward trend in financial performance metrics, including ROA, ROE, and Net Profit Margin. Furthermore, regression and correlation analyses have validated that investments in ICT positively influence bank performance, whereas fraud losses adversely affect profitability. Furthermore, secondary data analysis corroborates the notion that ICT and fraud detection substantially influence the performance of deposit money institutions in Nigeria.

### **Conclusion and Recommendations**

This study examined the impact of Information and Communication Technology (ICT) and fraud detection on the performance of deposit money institutions in Nigeria. The analysis was predicated on the notion that technology innovation has revolutionized banking operations while simultaneously subjecting banks to new forms of fraud and cybercrime. The study employed secondary data, comprising CBN releases, NDIC publications, annual reports from deposit money banks, and scholarly journals. Descriptive and inferential studies produced noteworthy results.

The study concluded that ICT has transformed the Nigerian banking sector by enhancing operational efficiency, expanding financial inclusion, and increasing profitability. The rapid integration of ICT has raised new fraud risks, requiring the establishment of effective fraud detection measures. Banks employing advanced ICT-based fraud detection systems are better positioned to mitigate financial losses, maintain consumer trust, and improve overall performance. Thus, information and communication technologies, together with fraud detection, are essential components of modern banking operations. Effective fraud detection systems safeguard bank assets and uphold the integrity and stability of the Nigerian financial system. The effectiveness of these techniques depends on continuous investment in technology, skilled individuals, and strict compliance with regulations.

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

1. **Interbank Collaboration:** Deposit money banks should collaborate by sharing intelligence on fraud patterns and cyber threats. A national fraud monitoring database administered by the CBN would improve collective defences against fraudsters.
2. **Research and Development (R&D):** Financial institutions should dedicate resources to R&D to explore innovative fraud detection approaches tailored for Nigeria's banking environment. Collaborations with ICT firms and educational institutions can produce practical solutions. The Nigerian government should amend cybercrime legislation to address the escalating threats in digital banking. Stringent penalties for cybercriminals and their inside collaborators will serve as a deterrent.
4. **Augmented Investment in ICT Infrastructure:** Deposit money banks must continually enhance their ICT infrastructure to optimise efficiency, strengthen fraud detection mechanisms, and sustain competitiveness in the digital banking arena.
5. **Advanced Fraud Detection Tools:** Financial institutions should employ artificial intelligence (AI), machine learning, and big data analytics to promptly detect unusual transactions. This will reduce delays in fraud detection and lessen financial losses.

## **References**

- Ailemen, D. (2018). Financial statement fraud: What auditors should know. *The Nigerian Accountant*, 39.
- Adeloye, A. (2017). Automated teller machine (ATM) Frauds in Nigeria: The way out. *Journal of Social Sciences*, 27(1): 53-58.
- Ajala, A. O., Amuda, T., & Arulogun, L. (2013). Evaluating internal control system as preventive measure of fraud in the Nigerian banking sector. *International Journal of Management Sciences and Business Research*, 2(9), 15-22.
- Aladejebi, O., & Oladimeji, A. J. (2019). Fraud management among small and medium enterprises in Lagos, Nigeria. *The International Journal of Business & Management*, 7(3), 227-236.
- Alao, A. (2016). Forensic auditing and financial fraud in Nigerian deposit money banks (DMBs). *European Journal of Accounting, Auditing and Finance Research*, 4(8), 1-19.
- Albashrawi, M. (2016). Detecting financial fraud using data mining techniques: A decade review from 2004 to 2015. *Journal of Data Science*, 14(1), 553-570.
- Amanze, B. C., & Onukwugha, C. G. (2017). Loan fraud detection system for banking industries in Nigeria using data mining and intelligent agents: The way forward. *International Journal of Innovative Research in Technology, Basic and Applied Sciences*, 4(1), 1-7.
- Ashamu, S. O. (2014). Fraud management in the Nigeria banking industry: Evidence from Nigeria. *Journal of Technology, Entrepreneurial and Rural Development*, 5(1), 125-137.

- Cai, Y., & Zhu, D. (2016). Fraud detections for online businesses: a perspective from blockchain technology. *Financial Innovation*, 2(20), 2-10.
- COSO (2016). *Fraud risk management guide*. Retrieved December 5, 2021, from <https://www.coso.org/documents/coso-fraud-risk-management-guide-executive-summary.pdf>
- Cram, W. A., Brohman, K., & Gallupe, R. B. (2016). Information systems control: A review and framework for emerging information systems processes. *Journal of the Association for Information Systems*, 17(4), 216-266.
- Desai, N. (2020). Understanding the theoretical underpinnings of corporate fraud. *The Journal for Decision Makers*, 45(1), 1-7.
- Eseoghene, J. I. (2010). Bank frauds in Nigeria: Underlying cause, effects and possible remedies. *African Journal of Accounting, Economics, Finance and Banking Research*, 6(6): 62-79.
- Eze, C., & Abiola, R. (2023). ICT adoption and cybersecurity challenges in Nigerian banks: Implications for fraud detection. *Journal of African Financial Studies*, 15(2), 45–60.
- Ezejiofor, R. A., Nwakoby, P. N., & Okoye, J. F. (2016). Impact of forensic accounting on combating fraud in Nigerian banking industry. *International Journal of Academic Research in Management and Business*, 1(6), 1-19.
- Fadayo, O. M. (2018). An examination of E-banking fraud prevention and detection in Nigeria banks. Unpublished PhD Thesis, De Montfort University. Retrieved June 26, 2021, <https://dora.dmu.ac.uk/bitstream/handle/2086/17520/Oluwalami%20Matthew%20Fadayo%20PhD%20Thesis.pdf?sequence=1&isAllowed=y>
- FITC. (2020). *Report on Fraud and Forgery in Nigerian Banks*.
- Flowerastia, R. D., Trisnawati, E., & Budiono, H. (2021). Fraud Awareness, Internal Control, and Corporate Governance on Fraud Prevention and Detection. *Advances in Social Science, Education and Humanities Research*, 570(1), 335-342.
- Gangwani, M. (2020). Suitability of forensic accounting in uncovering bank frauds in India: an opinion survey. *Journal of Financial Crime*, 28(2), 1-16.
- Georgios, V. L. (2019). Advancing theory of fraud: The S.C.O.R.E. model. *Journal of Financial Crime*, 26(1), 372-381.
- Handoko, B. L., & Tandean, D. (2021). An Analysis of Fraud Hexagon in Detecting Financial Statement Fraud (Empirical Study of Listed Banking Companies on Indonesia Stock Exchange for Period 2017– 2019). *7<sup>th</sup> International Conference on E-Business and Applications*, 93-100.
- Haoliang, W., & Smys, S. (2021). A survey on digital fraud risk control management by automatic case management system. *Journal of Electrical Engineering and Automation*, 3(1), 1-14.
- Hussaini, U., Bakar, A. A., & Yusuf, M.-B. O. (2019). The effect of fraud risk management, risk culture and performance of banking sector: A conceptual framework. *International Journal of Multidisciplinary Research and Development*, 6(1), 71-80.
- Idogei, O. S., Josiah, M., & Onomuhara, G. O. (2017). Internal control as the basis for prevention, detection and eradication of frauds in banks in Nigeria. *International Journal of Economics, Commerce and Management*, 3(12), 724-736.

- Idowu, I. (2009). An assessment of fraud and its management in Nigeria commercial banks. *European Journal of Social Sciences*, 10(4): 628-40.
- Ihejiahi, R. (2009). How to fight ATM fraud online. *Nigeria Daily News*. 18. <http://www.Socyberty.com/Law/>
- Jianhao, Y. (2019). Design and implementation of bank wind control anti-fraud project based on big data technology. *Journal of Physics: Conference Series*, 1-7.
- Kariapper, R., Razeeth, S. M., Pirapuraj, P., &Nafrees, A. C. (2020). Effectiveness of ATM and bank security: three factor authentications with systemetic review. *Journal of Physics*, 1-19.
- Kirkpatrick, E. M. (2015). Across the counter frauds in the banking industry. *Societal Journal of Accounting and Finance*, 3(1): 45-56.
- Kolapo, F. T., &Olaniyan, T. O. (2018). The impact of fraud on the performance of deposit money banks in Nigeria. *International Journal of Innovative Finance and Economics Research*, 6(1), 40-49.
- Lai, P. (2017). The Literature review of technology adoption models and theories for the novelty technology. *Journal of Information Systems and Technology Management*, 14(1), 21-38.
- Madinakhon, K., Dildora, R., Shohsanam , N., &Dilnoza, A. (2019). Banking frauds as a barrier for economic development: Is financial activity under Risky? *International Scientific Journal Theoretical & Applied Science*,5(73), 621-629.
- Mukhtaruddin, Sabrina, E., Hakiki, A., Saftiana, Y., &Kalsum, U. (2020). Fraudulent financial reporting: fraud pentagon analysis in banking and financial sector companies. *Issues in Business Management and Economics*,8(2), 12-24.
- Muritala, T., Ijaiya, M., Afolabi, O. and Yinus, A. (2020). Fraud and bank performance in Nigeria – var granger causality analysis. *Journal of Financial Internet*, 16(1): 20-26.
- Ogbonna, K. S., Okaro, C., &Igwe , I. E. (2019). Electronic fraud and credit facilitation of banks in Nigeria. *Journal of Accounting Information and Innovation*, 5(10), 1-13.
- Okafor, C. I., & Ojo, A. S. (2023). Fraud detection mechanisms and financial performance of deposit money banks in Nigeria. *Journal of Financial Crime*, 30(2), 389–406-2022-0214
- Okokpujie, K. O., John, S. N., Chinyere, K. G., Anele, C., &Olajide, F. (2016). Realtime fraud detection in the banking sector using data mining techniques/algorithms. *International Conference on Computational Science and Computational Intelligence*, (pp. 1186-1191).
- Okonkwo, I. V., &Ezegbu, N. L. (2016). Internal control techniques and fraud mitigation in Nigerian banks. *Journal of Economics and Finance*, 7(5), 37-46.
- Olaoye, C. O. and Dada, R. A. (2014). Analysis of frauds in banks – Nigeria’s experience. *European Journal of Business and Management*, 6(31): 90-99.
- Umar, M., & Ibrahim, Y. (2023). Information technology innovations and fraud prevention in the Nigerian banking sector. *International Journal of Information Systems and Social Change*, 14(1), 1–15.
- Usman, A. k., & Mahmood, S. H. (2013). Critical success factors for preventing e-banking fraud. *Journal of Internet Banking and Commerce*, 18(2), 2-14.
- Williams, T. H. and Mojekwe, J. N. (2019). An empirical investigation of the impact of credit risk management on commercial banks financial performance in Nigeria. (Generalized

Method of Moments Approach): UNILAG Journal of Humanities, 7(1): 126-38. View publication stats

Xie, Y., Liu, G., Cao, R., Li, Z., Yan, C., & Jiang, C. (2019). A feature extraction method for credit card fraud detection. 2nd International Conference on Intelligent Autonomous Systems.

Yazici, Y. (2020). Approaches to fraud detection on credit card transactions using artificial intelligence methods. *Computer Science & Information Technology*, 235-244.

Zheng, L., Liu, G., Yan, C., & Jiang, C. (2018). Transaction fraud detection based on total order relation and behavior diversity. *IEEE Transactions on Computational Social Systems*, 5(3), 796-806.