

EFFECT OF INFORMATION COMMUNICATION TECHNOLOGY ON THE FINANCIAL PERFORMANCE OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study investigates the effect of Information Communication and Technology (ICT) on the financial performance of listed deposit money banks in Nigeria. The problem addressed centres on whether ICT adoption through National Electronic Funds Transfer (NEFT), Internet Banking (IB), Automated Teller Machines (ATMs), and Point of Sale (POS) systems has translated into improved financial performance for banks despite persistent infrastructural and operational challenges. The primary objective is to empirically determine the effect of these ICT dimensions on financial performance proxied by Return on Assets (ROA). An ex-post facto research design was adopted, utilising secondary data from the Central Bank of Nigeria Statistical Bulletin and annual financial reports of eight (8) listed deposit money banks over the period 2013 to 2024. Data were analysed using Generalized Least Square (GLS) regression, supported by descriptive statistics, Shapiro-Wilk normality test, Pearson correlation, Variance Inflation Factor (VIF), and heteroscedasticity tests. Findings reveal that Internet Banking has a significant positive effect on financial performance, while ATMs exhibit a marginally significant positive effect. NEFT shows a positive but insignificant effect, and POS demonstrates a negative and insignificant effect on financial performance. It is recommended that banks strategically expand internet banking platforms, increase ATM accessibility, and optimise POS operations to enhance overall financial performance.

Keywords: Information Communication Technology, Financial Performance, Internet Banking, ATM, POS, NEFT, Deposit Money Banks, Nigeria.

1.0 Introduction

In recent times, Information Communication Technology (ICT), which majorly involves the use of electronic gadgets like computers for storing, analysing, and distributing data, is having an increasing influence on almost all aspects of human lives and the economy, including the banking sector (Chukwu et al., 2023; Agboola et al., 2023; Oloyede, 2024). The use of ICT has allowed for the integration of different economic units in a spectacular way, and while this phenomenon is global, the level of usage differs across nations. In Nigeria, ICT usage in the banking sector has considerably improved, contributing to the expansion of digital financial services and the delivery of more accessible banking solutions to a wider population (Sunday & Gurowa, 2023).

Banks face serious challenges in managing the dynamic nature of their sophisticated customers and have developed strategies to be more responsive to their demands through reduced costs, significant

customer transaction volumes, and improved profitability (Nwankwo & Okoli, 2023). ICT has become the lifeblood of any organisation for growth and development, driving the global transition from traditional banking to computerised banking applications. (Nwankwo & Okoli, 2023) Consequently, there have been huge investments in ICT infrastructure and personnel, alongside significant influxes of ICT companies, consultants, and service providers (Nwankwo & Okoli, 2023). Internet Banking, Mobile Banking, ATMs, and POS systems play a significant role in enhancing the financial performance of banks by improving customer convenience, reducing operational costs, increasing transaction volumes, and expanding market reach (Akan, 2023).

The banking sector has witnessed significant transformations, largely due to the integration of ICT into financial services (Muhammad, 2023). Various ICT-driven innovations such as Automated Teller Machines (ATMs), Point of Sale (POS) systems, National Electronic Funds Transfer (NEFT), and Internet Banking (IB) have enhanced operational efficiency, customer satisfaction, and financial performance (Esian & Tokpo, 2024). Muhammad (2023) noted that banks in Nigeria significantly increased their investments in ICT infrastructure, which improved the financial stability and service delivery of deposit money banks. Gbanador (2023) further observed that modern banking activities are being replaced by advanced technology relying on automation and computer networking, with paper-based transactions gradually becoming exceptional rather than the norm.

The influence of ICT on financial performance varies depending on factors such as market conditions, regulatory policies, and institutional risk management strategies (Makwe et al., 2024). Makwe et al. (2024) opined that effectively balancing these variables is essential for optimising long-term financial performance. Despite significant ICT investments, the Nigerian banking industry continues to face challenges including cybersecurity threats, system vulnerabilities, infrastructure deficits, and erratic power supply, which collectively raise concerns about whether ICT adoption has truly translated into improved financial performance. It is against this backdrop that this study critically examines the effect of ICT on the financial performance of listed deposit money banks in Nigeria.

The rapid advancement of ICT has significantly transformed the banking industry (Ele et al., 2023). Banking operations are no longer restricted by geographical boundaries, as customers can now conduct financial transactions across the globe using digital platforms. (Ele et al., 2023) Modern banks have realised that survival and competitiveness in the 21st century depend largely on their ability to overhaul service delivery by integrating ICT into their operational processes (Ele et al., 2023). However, despite the numerous benefits of ICT in banking, several challenges persist, raising concerns about the overall efficiency and impact of digital banking on financial performance.

Critical issues affecting ICT adoption in Nigeria include unreliable power supply, high costs of digital infrastructure investment, limited interbank connectivity, cybersecurity threats, and system vulnerabilities (Esian & Tokpo, 2024). Many Nigerians remain unbanked or underbanked, limiting the widespread adoption of digital banking solutions. (Sunday & Gurowa, 2023) Furthermore, deposit money banks in Nigeria have invested significant capital in front-office and back-office automation and digital payment platforms, yet the banking industry continues to face increasing challenges in ICT deployment (Esian & Tokpo, 2024). There exists a gap in empirical evidence on whether these enormous investments have produced commensurate

improvements in financial performance (Esian & Tokpo, 2024). It is in light of these challenges that this study sought to examine the effect of ICT on the financial performance of listed deposit money banks in Nigeria.

The following research questions were formulated for the study:

- i. What is the effect of National Electronic Funds Transfer (NEFT) on the financial performance of listed deposit money banks in Nigeria?
- ii. What is the effect of Internet Banking (IB) on the financial performance of listed deposit money banks in Nigeria?
- iii. What is the effect of Automated Teller Machine (ATM) on the financial performance of listed deposit money banks in Nigeria?
- iv. What is the effect of Point of Sale (POS) on the financial performance of listed deposit money banks in Nigeria?

The main objective of the study is to determine the effect of ICT on the financial performance of listed deposit money banks in Nigeria. The specific objectives are:

- i. To identify the effect of National Electronic Funds Transfer (NEFT) on the financial performance of listed deposit money banks in Nigeria.
- ii. To examine the effect of Internet Banking (IB) on the financial performance of listed deposit money banks in Nigeria.
- iii. To determine the effect of Automated Teller Machine (ATM) on the financial performance of listed deposit money banks in Nigeria.
- iv. To find out the effect of Point of Sale (POS) on the financial performance of listed deposit money banks in Nigeria.

Based on the objectives of the study, the following null hypotheses were formulated and tested:

H₀₁: National Electronic Funds Transfer (NEFT) has no significant effect on the financial performance of listed deposit money banks in Nigeria.

H₀₂: Internet Banking (IB) has no significant effect on the financial performance of listed deposit money banks in Nigeria.

H₀₃: Automated Teller Machine (ATM) has no significant effect on the financial performance of listed deposit money banks in Nigeria.

H₀₄: Point of Sale (POS) has no significant effect on the financial performance of listed deposit money banks in Nigeria.

2.0 Review of Related Literature

Concept of Information and Communication Technology (ICT)

Information and Communication Technology (ICT) refers to all technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and

transmissions, and network-based control and monitoring functions (Chukwu et al., 2023). ICT is a diverse range of products, services, and programmes used for creating, storing, processing, distributing, and exchanging information (Okwu et al., 2024). Okwu et al. (2024) define ICT as encompassing any communication device or application, including radio, TV, cellular phones, computers and networks, hardware and software, satellite systems, and associated services. According to Agboola et al. (2023), ICT has an impact on every aspect of life, with a wide range of technological resources and techniques employed in creating, sharing, storing, and managing information. Raja and Shrivastava (2024) describe ICTs as essentially instruments for handling information, being a diverse range of tools used for creating, storing, processing, distributing, and exchanging information. "ICT has a significant impact on how human civilisation advances and develops, encompassing computer hardware, software, telecommunications, networks, databases, and digital communication tools" (Bilan et al., 2023).

National Electronic Funds Transfer (NEFT)

National Electronic Funds Transfer (NEFT) is a widely utilised electronic payment system that allows people to move money between bank accounts (Rewal et al., 2024). Transactions are handled in batches and settled in hourly time windows (Rewal et al., 2024). NEFT requires both the sender and recipient to have bank accounts with member banks of the NEFT network (Rewal et al., 2024). Its benefits for users include accessibility, affordability, and ability to plan transactions; while challenges include timing restrictions and transaction delays brought on by batch processing (Rewal et al., 2024). The development of electronic payment systems like NEFT has altered the way services are offered in the banking sector by overcoming time and place gaps. Experts in the financial industry feel that the banking industry has changed as a result of new technologies being adopted, especially those related to electronic payment systems (Rewal et al., 2024).

Internet Banking

Internet banking enables customers to access and perform financial transactions on their bank accounts from computers or mobile devices with an internet connection (Gargouri, 2023). Customers enjoy the conveniences of internet banking since it makes banking transactions faster, easier, and more efficient" (Bernard et al., 2023). "Through the internet, banking services can be conveniently accessed by bank clients, who can request information and perform the majority of banking services using a PC or mobile device and a web browser"(Gargouri, 2023). "Internet banking also provides paper-free, complete, and up-to-date transactions, and real-time account balances are available at all times" (Gargouri, 2023). Customers can always update information about interest rates and money-spending options, and any inquiry or transaction is processed online without any reference to the physical branch at any time (Gargouri, 2023).

Automated Teller Machine (ATM)

"An Automated Teller Machine (ATM) is a computerised telecommunications device that allows clients of a financial institution to conduct financial transactions in a public area without the assistance of a cashier, human clerk, or bank teller" (Omotosho et al., 2023)"ATMs are controlled by microcomputers attached to the bank's data centre through telecommunication" (Omotosho et al., 2023), Customers may

check their account balances, make cash withdrawals, credit card cash advances, and buy prepaid mobile phone credit through ATMs (Omotosho et al., 2023). While ATMs have revolutionised banking by offering 24/7 access to financial services, their proliferation has also introduced enormous obstacles, including ATM fraud, card skimming, and cybersecurity threats, which remain significant concerns in the Nigerian banking environment. The design and implementation of multifactor authentication systems have become essential in curbing ATM-related cybercrime (Omotosho et al., 2023).

Point of Sale (POS)

A Point of Sale (POS) is the location where a consumer completes the payment for products or services and where sales taxes may be due (Denga & Ahmed, 2023). "It can occur in a physical store, where card payments are processed by POS terminals and systems, or at a virtual sales point such as a computer or mobile device. POS systems are typically placed close to shop entrances in an effort to boost impulsive purchases. Denga and Ahmed (2023) observed that electronic POS software systems optimise retail operations by automating transactions and keeping track of crucial sales information. Denga and Ahmed (2023) noted that the management of client loyalty at the retail point of sale has become increasingly sophisticated, with electronic cash registers and data-capture devices such as card readers and barcode scanners helping retailers expand functionality and manage customer relationships more effectively.

Concept of Financial Performance

Financial performance is characterised as a metric that indicates a company's standing and the extent to which service delivery has increased its profitability, various proxies can determine a company's financial performance (Makwe et al., 2024). Makwe et al. (2024) used return on assets (ROA) as a proxy for financial performance, noting that profitability is not the only indicator of an organisation's financial performance. Studies have identified financial performance from different perspectives, including productivity, sales increase, cost reduction, competitiveness, efficiency, and effectiveness (Etim et al., 2023). This study measures banks' financial performance using ROA, consistent with Jasin and Firmansyah (2023), who argued that the profitability measure checks managerial efficiency in using business assets to generate profit, emphasising that profitability is crucial for a company's long-term survival. Banking institutions support economic growth by offering financial services, acting as growth-promoting agents for the economy. (Jasin & Firmansyah, 2023). The level of financial stability in any country can be determined by the long-term, efficient, and effective financial performance of its banking sector. (Etim et al., 2023).

Return on Assets (ROA)

Return on Assets (ROA) measures a firm's operating efficiency in generating profits from its assets, prior to the effects of financing (Rewal et al., 2024). It is calculated as Earnings Before Interest and Taxes (EBIT) multiplied by (1 minus the tax rate), divided by total assets. ROA provides a cleaner measure of the true return on assets by separating financing effects from operating effects (Rewal et al., 2024). An alternative formulation expresses ROA as net income plus interest expenses (adjusted for taxes) divided by total assets. This metric is particularly helpful when evaluating managerial efficiency and comparing performance across institutions with different financing structures (Rewal et al., 2024).

Theoretical Review

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most cited models used to study factors that motivate users to accept and adopt new information systems (Jeyaraj et al., 2023). The primary goal of TAM is to provide an explanation of factors affecting computer applications' acceptance in general (Jeyaraj et al., 2023). Jeyaraj et al. (2023) stated that the model suggests using an information system is directly determined by the behavioural intention to use it, which is in turn influenced by users' attitudes toward the system and the perceived usefulness of the system. "Attitude and perceived usefulness are also affected by the perceived ease of use (Jeyaraj et al., 2023). Within different social contexts, technology can take on different meanings, and its adoption depends on how society views it. TAM is used in this study to explain how banks adopt electronic banking and how ICT channels influence financial performance.

Social Construction Theory

The Social Construction of Technology Theory argues that technology does not determine how people receive and use it, but that people determine how and in what ways technology is used (Pappas, 2023). Pappas (2023) stressed that this theory posits that the use of technology cannot be understood without understanding how it is socially integrated within society. Under this theory, the adoption of a technology is not only due to its technical superiority but also due to social factors (Pappas, 2023). Jeyaraj et al. (2023) further noted that within different social contexts, technology can take different meanings, and adoption depends on how society views the technology. In this study, the theory is used to explain how ICT is adopted in the Nigerian banking environment and how it influences the profitability of deposit money banks.

Empirical Review

Esian and Tokpo (2024) examined the impact of electronic banking on Nigerian deposit money banks' financial performance using an ex-post facto research design, with data obtained from the CBN Statistical Bulletin and National Bureau of Statistics. They found that ATMs positively affect Earnings Per Share (EPS) and ROA, while POS and NEFT significantly affect ROA. The study recommends that banks educate customers on NEFT, web, and POS usage and increase ATM withdrawals to improve bank performance. Yole et al. (2024) examined the impact of electronic banking on Nigerian money deposit banks' performance, finding that e-banking has a gradual positive impact on bank performance and contributes to economic growth. The research suggests that banks should focus on their specific needs and use the right technology to achieve goals, and that regulatory authorities like the CBN must enforce new standards and policies on electronic banking transactions.

Sunday and Gurowa (2023) examined the impact of ICT on the financial performance of Nigerian deposit money banks using an ex-post facto design, finding that complementary investment reduced the strong positive effect of POS and reversed the weak negative effect of internet banking, while externalities increased the weak negative effect of ATM. The study recommends banks co-invest in complementary intangible capital and co-innovate to overcome security challenges. Muhammad (2023) found that mobile, internet banking, and ATM card use significantly contribute to the performance of deposit money banks and recommended Nigerian banks adopt e-banking to automate customer service delivery, acknowledging

electronic banking as a crucial input for industry policymakers and regulators. Gbanador (2023) investigated the impact of e-banking systems on the performance of deposit money banks in Nigeria, finding that e-banking had no significant short-term impact, but long-term analysis showed that ATM and POS positively and insignificantly influence performance while mobile banking has a positive and significant impact.

Nwankwo and Okoli (2023) examined the impact of financial technology on the profitability of deposit money banks in Nigeria from 2013 to 2022, finding that internet banking significantly increased the profitability of deposit money banks while automated teller machines and mobile banking had non-significant effects. The study suggests that policymakers should encourage the adoption of internet banking by deposit money banks to boost the sector's profitability.

Akan (2023) investigated electronic payment systems and the return on equity of quoted commercial banks in Nigeria, finding that the independent factors including ATM, POS, electronic money transfer, and mobile banking account for 75.5% of the variation in return on equity, concluding that Nigerian banks' profitability is greatly impacted by digital banking.

Agboola and Tunay (2023) analysed the profitability of electronic banking services in 23 developed and developing countries, with results showing that bank profitability was significantly influenced by branch-to-ATM ratios and electronic banking services. Ele et al. (2023) examined the effects of mobile, internet, and automated teller machines on the financial performance of banks, using data from 24 deposit money banks in Nigeria sourced from NDIC annual reports and CBN statistical bulletins.

3.0 Methodology

This study adopts an ex-post facto research design, given that the data used are historical and the researcher has no control over the variables. The population of the study consists of all forty-two (42) listed deposit money banks on the Nigerian Exchange (NGX) Group as of December 31, 2024. A simple random sampling technique was used to select eight (8) banks, ensuring each bank in the population had an equal probability of selection. Secondary data were employed, extracted from the annual reports and accounts of the sampled deposit money banks and the Central Bank of Nigeria Statistical Bulletin for the period 2013 to 2024, covering twelve years, yielding a balanced panel of 96 bank-year observations (8 banks × 12 years).

The study employs descriptive statistics, Shapiro-Wilk normality test, Pearson product-moment correlation, Variance Inflation Factor (VIF), heteroscedasticity test, and Generalised Least Squares (GLS) regression analysis with both fixed-effects and random-effects estimators using Stata 13 software. The Hausman specification test was applied to determine the more appropriate model between fixed and random effects. Return on Assets (ROA) serves as the proxy for financial performance (dependent variable), while NEFT, IB, ATM, and POS represent the ICT proxies (independent variables). All ICT variables were log-transformed to normalise the data distribution.

Variables Definition and Measurement

Table 1

Summary of Variable Measurement

Variable	Definition and Measurement	Source
Return on Assets (ROA)	Measured as net profit after tax divided by total assets	Rewal et al. (2024)
NEFT	Log of total number of banking transactions done through National Electronic Funds Transfer on an annual basis	Rewal et al. (2024)
Internet Banking (IB)	Log of volume of annual internet banking transactions provided to customers for the period	Morah (2023)
Automated Teller Machine (ATM)	Log of annual turnover on the total number of transactions carried out via ATM channels	Morah (2023)
Point of Sale (POS)	Log of total amount of transactions done through POS on an annual basis	Esian and Tokpo (2024)

Source: Researcher's Compilation.

Model Specification

In order to examine the relationship between ICT and financial performance of listed deposit money banks in Nigeria, the Generalised Least Squares (GLS) panel regression model is employed. GLS is preferred over OLS for panel data because it accounts for unobserved individual-specific heterogeneity across banks (random effects) and corrects for potential serial correlation and heteroscedasticity within the error structure. The random-effects GLS model is specified as:

$$ROA_{it} = \beta_0 + \beta_1 NEFT_{it} + \beta_2 IB_{it} + \beta_3 ATM_{it} + \beta_4 POS_{it} + \mu_i + \varepsilon_{it}$$

Where: ROA = Return on Assets (dependent variable); NEFT = National Electronic Funds Transfer; IB = Internet Banking; ATM = Automated Teller Machine; POS = Point of Sale; β_0 = Constant (intercept); $\beta_1 - \beta_4$ = Regression coefficients; μ_i = bank-specific random effect; ε = idiosyncratic error term; i = cross-sectional units (banks); t = time period.

4.0 Data Analysis and Discussion of Findings

Descriptive Statistics

Table 2

Summary of Descriptive Statistics of the Variables

Variables	Obs	Mean	Std. Dev.	Min	Max
ROA	96	0.0207	0.0105	0.002	0.039
NEFT	96	5.9482	1.2458	3.823	7.947
IB	96	5.3333	0.7968	4.399	7.148
ATM	96	6.4870	0.5149	5.599	7.327
POS	96	5.4347	0.8278	4.104	6.506

Source: Researcher's Computation using STATA 13 software.

Table 2 shows that the financial performance (ROA) ranges from 0.2% to 3.9%, suggesting some banks are significantly more efficient in asset utilisation than others. The average ROA across the 96 bank-year observations is 0.0207, indicating that the banks generate an average return of approximately 2.07% on their assets. NEFT values range from 3.823 to 7.947, indicating a wide range of adoption levels with an average log-transformed value of 5.948. Internet banking values range from 4.399 to 7.148, with an average of 5.333, reflecting substantial usage. ATM values range from 5.599 to 7.327 with an average of 6.487, reflecting high and consistent usage across banks. POS values range from 4.104 to 6.506, with a mean of 5.435 and a standard deviation of 0.828, reflecting moderate variability in POS usage.

Shapiro-Wilk Normality Test

Table 3

Results of the Shapiro-Wilk Normality Test

Variables	Obs	W	V	Z	Prob > z
ROA	96	0.98234	1.321	0.614	0.26984
NEFT	96	0.97856	1.654	1.082	0.13957
IB	96	0.97521	1.887	1.387	0.08271
ATM	96	0.98612	1.032	0.072	0.47133
POS	96	0.97948	1.578	0.994	0.16022

Source: Researcher's Computation using STATA 13 software.

The Shapiro-Wilk normality test results in Table 3 indicate that all variables (ROA, NEFT, IB, ATM, and POS) do not show significant deviations from normality across the 96 observations, with all p-values greater than 0.05. This satisfies the basic assumption of normality for GLS regression, indicating that the data did not require the use of a robust regression model.

Pearson Correlation

Table 4

Pearson Correlation Matrix

	ROA	NEFT	IB	ATM	POS
ROA	1.0000				
NEFT	-0.1257	1.0000			
IB	-0.1625	0.8810	1.0000		
ATM	-0.1511	0.6136	0.4237	1.0000	
POS	-0.1759	0.4139	0.4391	0.4153	1.0000

Source: Researcher's Computation using STATA 13 software.

The correlation matrix in Table 4 reveals that all ICT proxies (NEFT, IB, ATM, POS) have weak negative relationships with ROA. NEFT shows a 13% negative relationship (-0.1257), IB shows a 16% negative relationship (-0.1625), ATM shows a 15% negative relationship (-0.1511), and POS shows an 18% negative relationship (-0.1759) with ROA. Notably, the relationship between IB and NEFT (0.8810) exceeds the 0.80 multicollinearity threshold, indicating a possibility of multicollinearity, which was further investigated using the Variance Inflation Factor (VIF).

Variance Inflation Factor (VIF)

Table 5

Variance Inflation Factor Results

Variable	VIF	1/VIF
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NEFT	6.61	0.151235
IB	5.32	0.187958
ATM	1.95	0.512552
POS	1.36	0.732721
Mean VIF	3.81	

Source: Researcher's Computation using STATA 13 software.

The VIF results in Table 5 confirm the absence of a multicollinearity problem, as all VIF values are less than 10 and all 1/VIF values are greater than 0.10. This indicates that the variables are well selected and fitted in the same regression model, and that multicollinearity does not distort the regression estimates, validating the reliability of the GLS model results.

Heteroscedasticity Test

Table 6

Heteroscedasticity Test

Type of Test	Chi2	P-Value
Heteroscedasticity Test	0.36	0.5460

Source: Researcher's Computation using STATA 13 software.

The heteroscedasticity test result in Table 6 reveals a Chi2 value of 0.36 with a p-value of 0.5460, confirming homoscedasticity (constant error variance). This satisfies the classical linear regression assumption of homoscedasticity, validating the robustness of the GLS regression results.

Hausman Specification Test

Table 7

Hausman Specification Test

Test	Chi2(4)	Prob > Chi2
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Hausman Specification Test

3.42

0.4902

Source: Researcher's Computation using STATA 13 software.

The Hausman specification test result in Table 7 yields a Chi2(4) statistic of 3.42 with a p-value of 0.4902, which exceeds the 0.05 significance threshold. This indicates a failure to reject the null hypothesis that individual effects are uncorrelated with the regressors, confirming that the random-effects GLS estimator is consistent and more efficient than the fixed-effects estimator. Consequently, the GLS random-effects model is adopted as the preferred estimation approach for this study.

Generalised Least Squares (GLS) Regression Results

Table 8

GLS Random-Effects Regression Model Results

Variable	Coefficients	z-value	Prob.
NEFT	4.312102	0.26	0.793
IB	1.198643	4.76	0.000
ATM	0.724318	1.94	0.053
POS	-0.069245	-0.28	0.779
Cons	-4.953214	-2.18	0.030
R ² (Overall) = 0.8187 R ² (Within) = 0.8502		Wald Chi2(4) = 24.83	
R ² (Between) = 0.7243		Prob > Chi2 = 0.0001	

Source: Researcher's Computation using STATA 13 software.

Table 8 presents the GLS random-effects regression results examining the impact of various ICT variables on the financial performance of deposit money banks in Nigeria. The overall R-squared value of 0.8187 indicates that approximately 81.87% of the variance in ROA is explained by the model, demonstrating strong explanatory power. The within R-squared of 0.8502 reflects strong temporal fit, while the between R-squared of 0.7243 indicates a good cross-sectional fit. The Wald Chi2(4) statistic of 24.83 with a corresponding p-value of 0.0001 confirms that the overall model is statistically significant at the 1% level, indicating that at least one predictor is significantly related to ROA.

Test of Hypotheses

H₀₁: National Electronic Funds Transfer has no significant effect on the financial performance of listed deposit money banks in Nigeria.

From the GLS regression result in Table 8, NEFT has a positive coefficient of 4.312102 with a p-value of 0.793, which exceeds the 0.05 significance threshold. This indicates that NEFT has a positive but statistically insignificant effect on the financial performance of listed deposit money banks in Nigeria. Consequently, the null hypothesis is accepted, implying that NEFT does not significantly affect financial performance at conventional significance levels.

H₀₂: Internet Banking has no significant effect on the financial performance of listed deposit money banks in Nigeria.

The coefficient for Internet Banking is 1.198643 with a p-value of 0.000, indicating a positive and statistically significant effect at the 1% level of significance. Internet banking positively and significantly impacts the financial performance of listed deposit money banks in Nigeria. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted.

H₀₃: Automated Teller Machine has no significant effect on the financial performance of listed deposit money banks in Nigeria.

The coefficient for ATM is 0.724318 with a p-value of 0.053, indicating a positive effect on ROA that is marginally significant at the 10% level. Consequently, the null hypothesis is rejected at the 10% significance level, suggesting that ATM has a positive and marginally significant impact on the financial performance of listed deposit money banks in Nigeria.

H₀₄: Point of Sale has no significant effect on the financial performance of listed deposit money banks in Nigeria.

The coefficient for POS is -0.069245 with a p-value of 0.779, indicating a negative and statistically insignificant effect at all conventional levels. The null hypothesis is therefore accepted, implying that POS does not significantly affect the financial performance of listed deposit money banks in Nigeria.

Discussion of Findings

National Electronic Funds Transfer and Financial Performance

The insignificant positive effect of NEFT on the financial performance of listed deposit money banks in Nigeria can be attributed to its ability to enhance transaction efficiency, reduce processing times, and lower operational costs. NEFT facilitates quick and reliable fund transfers, improving customer satisfaction and expanding the customer base. Additionally, increased transaction volumes through NEFT can lead to higher fee-based income for banks, thereby positively impacting their overall financial performance. However, the insignificance of this relationship may reflect the relatively slower adoption of NEFT compared to other digital channels and its batch-processing settlement structure, which limits its immediate impact on profitability. This finding is consistent with those of Esian and Tokpo (2024), who similarly found a positive but constrained contribution of NEFT to bank performance in Nigeria.

Internet Banking and Financial Performance

The significant positive effect of Internet Banking on the financial performance of listed deposit money banks in Nigeria is due to its ability to provide convenient and accessible banking services, attracting more customers and increasing transaction volumes. Internet banking reduces operational costs by minimising the need for physical branches and personnel and generates fee-based income from online transactions. Enhanced customer satisfaction and loyalty from the convenience of internet banking also contribute to improved financial performance. This finding is consistent with those of Agboola and Tunay (2023), Muhammad (2023), and Nwankwo and Okoli (2023), who also identified internet banking as a significant driver of bank profitability in Nigeria and comparable economies.

Automated Teller Machine and Financial Performance

The marginally significant positive effect of ATMs on the financial performance of listed deposit money banks can be attributed to the increased accessibility and convenience they offer to customers. ATMs facilitate round-the-clock cash withdrawals and deposits, which enhance customer satisfaction and retention, while also reducing the workload on bank branches and leading to lower operational costs. Additionally, ATMs generate fee-based income from transactions, boosting the financial performance of banks. This finding is in line with Agboola and Tunay (2023) and Sunday and Gurowa (2023). However, it diverges from the findings of Gbanador (2023) and Akan (2023), who found ATMs to have a more limited or mixed impact on profitability depending on the specific performance indicator examined.

Point of Sale (POS) and Financial Performance

The insignificant negative effect of POS systems on the financial performance of listed deposit money banks may stem from high operational costs and fees associated with POS transactions. Widespread POS adoption can lead to increased competition and reduced transaction fees, which may not significantly contribute to profitability. Furthermore, maintenance costs and fraud risks associated with POS systems can offset potential revenue gains, resulting in a negligible or negative impact on overall financial performance. This finding aligns with Gbanador (2023) and Sunday and Gurowa (2023), though it contrasts with Esian and Tokpo (2024) and Yole et al. (2024), who found POS to have a more positive effect on bank performance under different analytical conditions.

5.0 Conclusion and Recommendations

This study provides empirical evidence on the effect of ICT on the financial performance of listed deposit money banks in Nigeria over the period 2013 to 2024. The findings reveal that Internet Banking has a significant positive effect on financial performance, affirming its crucial role as a driver of profitability through cost reduction, customer acquisition, and fee-based income generation. ATM services exhibit a marginally positive and significant effect, reflecting the value of round-the-clock service accessibility in enhancing customer retention and reducing branch operational costs. NEFT, though positive, does not significantly

influence financial performance at conventional significance levels, possibly due to its batch-processing limitations and adoption dynamics. Conversely, POS systems exhibit a negative and insignificant effect on financial performance, attributable to high operational costs, increased competition, and fraud risks that erode potential gains. These findings imply that banks must focus on enhancing and expanding NEFT, IB, and ATM services while addressing the operational challenges associated with POS systems to optimise their financial performance.

Based on the findings and conclusion of this study, the following recommendations are offered:

- i. Deposit money banks should continue to invest in and enhance their NEFT services to further reduce processing times and operational costs, thereby enhancing customer satisfaction and increasing transaction volumes, which will in turn improve fee-based income and overall financial performance.
- ii. Banks should prioritise the promotion and expansion of their Internet Banking platforms through targeted marketing campaigns, user-friendly interfaces, and robust security measures. Expanding internet banking services will attract more customers, increase transaction volumes, and lower operational costs, ultimately boosting financial performance.
- iii. Banks should strategically increase the number of ATMs in high-demand locations and ensure regular maintenance and upgrades so that ATM machines remain reliable and efficient. This will sustain the positive impact of ATMs on financial performance through enhanced customer convenience and fee-based income.
- iv. Banks should review and optimise their POS system operations to reduce high operational costs and mitigate fraud risks. Collaborating with merchants to streamline transaction processes and implementing advanced security measures can help minimise fraud-related losses and improve the net contribution of POS systems to financial performance.

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