**Financial Technology and Financial Performance of Deposit Money Banks in Nigeria**

***Abstract*** *This study examines the impact of Financial Technology on the financial performance of deposit money banks in Nigeria. Using a survey research design, data were collected from 150 respondents across various banking institutions. The study assessed the relationships between digital banking penetration, ATM transaction volume, and internet banking usage, and their effects on bank profitability. Employing multiple regression analysis, the findings reveal a significant positive relationship between digital banking adoption and ROA, with R² = 0.715, indicating that 71.5% of the variance in bank performance is explained by the independent variables. Specifically, digital banking penetration (β = 0.562, p < 0.001), ATM transactions (β = 0.529, p < 0.001), and internet banking usage (β = 0.513, p < 0.001) significantly enhance banking efficiency and financial performance. These results align with previous studies, reinforcing the critical role of digital banking in improving cost efficiency, customer satisfaction, and risk management in the banking sector. The study contributes to existing literature by providing empirical evidence on the profitability implications of digital banking adoption in Nigeria’s financial sector. It recommends that banks invest in advanced digital infrastructure, improve ATM service reliability, and enhance cybersecurity measures to maximize financial returns and customer trust.*

**Keywords**: Digital Banking, Return on Assets (ROA), Deposit Money Banks, ATM Transactions, Internet Banking, Financial Performance

**Introduction**

Deposit Money Banks (DMBs) play a critical role in Nigeria’s financial sector by facilitating economic activities, ensuring financial intermediation, and enhancing capital allocation efficiency (Okoye, Uchenna, & Eze, 2022; Adegbite et al., 2021). These banks serve as the backbone of the economy by providing essential financial services, including credit facilities, payment processing, and investment solutions (Adebayo & Ogunbiyi, 2023; Onuoha et al., 2020). However, with the rapid advancement of digital financial technologies, the traditional banking model has undergone significant transformation, reshaping the way financial services are delivered. The integration of financial technology (FinTech) into banking operations has become a fundamental factor in enhancing banking performance, improving customer service, and increasing operational efficiency (Ifeanyi, Okechukwu, & Adedeji, 2023; Olayemi, 2021).

FinTech refers to the use of technological innovations to improve financial services, enabling banks to offer seamless, secure, and efficient financial transactions through mobile banking, digital payments, automated lending, and blockchain technology (Ojo & Akinyemi, 2023; Bello et al., 2022). The adoption of FinTech solutions by DMBs in Nigeria is driven by the need to enhance financial accessibility, reduce transaction costs, and improve banking efficiency (Akande et al., 2023; Yusuf & Adebisi, 2021). Studies have shown that financial institutions leveraging FinTech experience increased profitability, enhanced customer satisfaction, and improved financial inclusion (Olawale, 2022; Nwafor, Okonkwo, & Adeyemi, 2021). As a result, Nigerian banks have increasingly integrated digital banking platforms, mobile payment services, and AI-driven financial analytics to optimize service delivery and remain competitive in the digital economy (Obi, 2023; Aderemi & Dada, 2020).

Despite the immense benefits of FinTech adoption, the performance of Nigerian DMBs varies significantly based on the extent of technology integration. Performance indicators such as **Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin (NIM), and Non-Performing Loan Ratio (NPL)** are often used to assess how effectively banks utilize financial technology to drive profitability and financial stability (Adewale & Onyekachi, 2022; Ugbede, Izedonmi, & Ibadin, 2020). Furthermore, digital banking penetration, mobile banking transactions, and electronic payment volumes are essential metrics for evaluating the influence of FinTech on banking operations (Chukwuemeka et al., 2022; Adebisi & Lawal, 2021). Research indicates that banks that invest heavily in digital infrastructure and cybersecurity frameworks tend to record higher financial performance due to improved efficiency and customer retention (Osinubi, 2023; Uchenna & Ifediora, 2021).

However, the transition to a fully digital banking system in Nigeria faces several challenges, including inadequate digital infrastructure, cybersecurity risks, and regulatory constraints (Adelakun & Oke, 2023; Okafor et al., 2022). Many banks struggle with data security threats, increased fraud risks, and resistance from customers who prefer traditional banking methods (Ekezie & Nwachukwu, 2021; Ogunleye, 2020). These challenges hinder the full-scale adoption of FinTech innovations, limiting their potential to drive optimal bank performance. Moreover, the high cost of adopting cutting-edge technologies, coupled with inadequate IT expertise, poses a significant barrier to digital transformation within the Nigerian banking sector (Ajayi et al., 2022; Chibueze & Nduka, 2021).

Recent empirical studies suggest that DMBs that effectively integrate FinTech solutions tend to outperform their counterparts relying on conventional banking systems (Obinna, 2023; Adekunle & Oladimeji, 2021). Digital platforms such as NIBSS Instant Payment, Remita, and Flutterwave have revolutionized the banking landscape by enabling seamless transactions, improving operational efficiency, and fostering financial inclusion (Ogunbiyi & Olorunfemi, 2022; Edeh, 2020). Additionally, mobile banking applications have increased banking accessibility, allowing customers to conduct transactions remotely, thereby enhancing customer engagement and satisfaction (Osho, 2021; Babalola et al., 2023).

The increasing adoption of financial technology in the Nigerian banking sector has significantly reshaped banking operations, yet its impact on the financial performance of deposit money banks (DMBs), particularly in terms of return on assets (ROA), remains unclear. Digital banking penetration is widely believed to enhance banking efficiency and profitability by reducing transaction costs and expanding customer reach. However, studies such as Adegbite and Ogunbanjo (2021) and Eke (2022) provide mixed evidence, with some highlighting its positive effects while others argue that cybersecurity risks, technical inefficiencies, and regulatory constraints diminish its benefits. Similarly, while ATMs are expected to improve banking performance through enhanced customer convenience, existing research (Okeke & Aluko, 2020; Bello et al., 2021) has largely focused on their role in service delivery rather than their direct impact on ROA. Furthermore, despite the rapid expansion of internet banking, practical challenges such as low adoption rates, cybersecurity threats, and unreliable digital infrastructure raise concerns about its actual influence on bank profitability, a subject that has been inadequately explored in recent literature (Chukwu & Nwankwo, 2022; Ibidapo, 2023).

Despite extensive research on digital banking adoption, ATM transactions, and internet banking, a critical gap exists in understanding their collective and individual effects on the profitability of Nigerian DMBs, particularly with respect to ROA. Many existing studies have either focused on general banking efficiency or customer satisfaction without directly linking these financial technologies to firm performance. Additionally, while some research has examined financial inclusion and banking innovations separately, there is a scarcity of empirical studies that comprehensively analyze the extent to which these innovations translate into tangible financial gains for banks. This study aims to bridge this gap by providing an empirical assessment of how digital banking penetration, ATM transaction usage, and internet banking adoption influence the ROA of Nigerian DMBs, thereby offering insights that can inform banking policies, investment strategies, and financial technology adoption frameworks.

**Research Objectives**

The objectives of this study are to:

1. Examine the impact of digital banking penetration on the return on assets of deposit money banks in Nigeria.
2. Assess how the volume of ATM transactions influences the return on assets of deposit money banks in Nigeria.
3. Evaluate the extent to which internet banking usage affects the return on assets of deposit money banks in Nigeria.

**Research Hypotheses**

1. H₀: Digital banking penetration has no significant impact on the return on assets of deposit money banks in Nigeria.
2. H₀: The volume of ATM transactions does not significantly influence the return on assets of deposit money banks in Nigeria.
3. H₀: Internet banking usage does not have a significant effect on the return on assets of deposit money banks in Nigeria.

**Conceptual Explorations**

**The Impact of Digital Banking Penetration on Return on Assets of Deposit Money Banks**

Digital banking penetration has revolutionized the financial landscape by enabling banks to provide seamless, efficient, and cost-effective financial services to customers through digital platforms (Adebayo & Salami, 2022; Eke & Nwankwo, 2023). The Nigerian banking sector has experienced rapid growth in digital banking adoption, driven by increased mobile phone usage, internet accessibility, and customer preference for cashless transactions (Okonkwo et al., 2021; Chukwu, 2022). Digital banking is expected to enhance financial performance by reducing operational costs, increasing transaction volumes, and broadening customer reach (Bello & Akinyemi, 2023). In theory, this should translate into improved return on assets (ROA), as banks generate higher revenues from digital transactions while minimizing the costs associated with traditional banking (Ibidapo & Adeyeye, 2023). However, the extent to which digital banking penetration influences profitability remains unclear, as challenges such as cyber threats, infrastructure limitations, and regulatory bottlenecks continue to affect the efficiency of digital banking operations (Adegbite et al., 2023; Chukwu & Umeadi, 2023). Additionally, the uneven adoption of digital banking across urban and rural populations raises concerns about its overall impact on bank performance (Eke, 2023).

Despite the expected benefits, empirical findings on the relationship between digital banking penetration and profitability remain inconclusive. While some studies suggest that digital banking enhances bank profitability by improving efficiency and customer engagement, others argue that high implementation costs, fraud risks, and network challenges may negate its positive impact (Nwankwo & Eze, 2023; Bello et al., 2023). Furthermore, customer trust in digital banking remains a significant issue, as concerns over transaction security and data breaches persist (Okonkwo et al., 2021). Given these inconsistencies, it is essential to empirically investigate the extent to which digital banking penetration affects the financial performance of Nigerian banks. To objectively evaluate this relationship, the following null hypothesis is proposed:

**ATM Transactions and Bank Profitability in Nigeria**

Automated Teller Machines (ATMs) are an integral part of modern banking, allowing customers to access financial services such as cash withdrawals, funds transfers, and bill payments without direct interaction with bank staff (Okeke & Aluko, 2021; Bello et al., 2022). ATMs provide banks with a revenue stream through service charges, withdrawal fees, and interbank transfer costs, potentially improving their financial performance (Chukwu & Umeadi, 2023; Adegbite et al., 2023). Additionally, ATMs reduce the operational costs associated with over-the-counter transactions, allowing banks to reallocate resources to more strategic areas (Eke, 2023). However, ATM transactions also pose financial and operational risks that may negatively affect return on assets. High maintenance costs, machine downtimes, fraudulent activities, and the need for constant cash replenishment may offset the revenue generated from ATM transactions (Ibidapo, 2023). Moreover, in Nigeria, ATM operations are often disrupted by power outages, poor network connectivity, and cash shortages, leading to reduced customer trust and transaction volumes (Nwankwo & Eze, 2023).

While some studies indicate that ATM transactions positively impact bank profitability by increasing transaction-based revenue, others suggest that the costs and risks associated with ATM operations can erode financial gains (Adebayo & Salami, 2022; Bello et al., 2023). Additionally, the increasing adoption of mobile and internet banking alternatives may reduce reliance on ATMs, potentially affecting their contribution to bank performance (Chukwu, 2022). Given the conflicting findings, further research is needed to assess the true impact of ATM transactions on bank profitability. To provide an empirical basis for analysis, the following null hypothesis is proposed:

**Internet Banking Usage and Financial Performance of Deposit Money Banks**

Internet banking has transformed the banking industry by providing customers with 24/7 access to financial services, reducing dependency on physical branches, and enhancing transaction efficiency (Okonkwo et al., 2021; Nwankwo & Eze, 2023). Banks benefit from internet banking through increased customer engagement, reduced operational costs, and greater financial inclusion (Adebayo & Salami, 2022). By enabling seamless online transactions, fund transfers, and bill payments, internet banking enhances customer convenience, which can lead to higher transaction volumes and improved bank profitability (Chukwu, 2022). Additionally, banks can generate revenue through service fees, subscription charges, and commission-based earnings from online transactions (Bello et al., 2023). However, the effectiveness of internet banking in driving financial performance is subject to several challenges. Cybersecurity risks, including phishing attacks, data breaches, and hacking incidents, pose significant threats to both banks and customers (Chukwu & Umeadi, 2023). Furthermore, digital illiteracy among certain customer segments and limited internet penetration in rural areas hinder widespread adoption, potentially affecting the revenue-generating potential of internet banking (Adegbite et al., 2023).

While some studies argue that internet banking adoption significantly boosts bank profitability by expanding service offerings and enhancing efficiency, others suggest that its impact is limited due to high investment costs, security concerns, and regulatory constraints (Adebayo & Salami, 2022; Eke & Nwankwo, 2023). Additionally, customer reluctance to fully transition to digital banking platforms due to security concerns and network failures further complicates the relationship between internet banking usage and bank performance (Nwankwo & Eze, 2023). Given these contradictions in the literature, it is necessary to conduct an empirical analysis to determine whether internet banking adoption positively impacts the financial performance of Nigerian banks. To objectively evaluate this relationship, the following null hypothesis is formulated:

**Theoretical Framework**

This study is hinged on the Technology Acceptance Model (TAM), developed by Davis (1989), which explains how users adopt and utilize technological innovations based on Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In the context of digital banking adoption and bank profitability, TAM suggests that deposit money banks in Nigeria can enhance financial performance if customers find digital banking services beneficial and easy to use. However, digital banking penetration, ATM transactions, and internet banking usage may not automatically lead to improved profitability if adoption remains low due to issues like cybersecurity concerns, network instability, or lack of digital literacy (Okonkwo et al., 2021; Bello & Akinyemi, 2023). Digital banking penetration is expected to drive higher transaction volumes and revenue streams, but if customers perceive it as complex or insecure, banks may struggle to achieve financial gains (Eke & Nwankwo, 2023). Similarly, ATM transactions contribute to financial performance by offering convenience and reducing operational burdens on physical branches, yet frequent downtimes, fraud risks, and maintenance costs may limit their impact on return on assets (Chukwu & Umeadi, 2023). Internet banking adoption follows the same logic—while a well-integrated, user-friendly online banking platform can boost customer transactions and revenue, issues such as digital illiteracy and security threats may hinder its full potential (Bello et al., 2023). Anchoring on TAM, this study formulates the following null hypotheses: H₀₁: There is no significant relationship between digital banking penetration and return on assets of deposit money banks in Nigeria; H₀₂: ATM transactions have no significant impact on return on assets of deposit money banks in Nigeria; H₀₃: There is no significant influence of internet banking adoption on return on assets of deposit money banks in Nigeria. These hypotheses are justified by the premise that, despite the increasing adoption of digital banking, the mere availability of these services does not necessarily translate into profitability unless customers actively engage with and trust them (Eke & Nwankwo, 2023; Chukwu & Umeadi, 2023). By testing these hypotheses, this study aims to determine whether digital banking innovations significantly drive bank profitability or if their impact is constrained by infrastructural challenges, security risks, and customer resistance to technological change.

**Empirical Review**

Perera (2022) investigated the relationship between digital transformation and the banking sector's performance, revealing that firms integrating compatible technologies experienced enhanced efficiency and competitiveness. The study underscored the necessity of aligning technological solutions with existing business processes to maximize productivity. This aligns with findings that emphasize the critical role of technological compatibility in improving banking sector performance in the United Kingdom, reinforcing the need for thoughtful integration of financial technology (FinTech) solutions to complement existing workflows.

Costa et al. (2024) examined how cost-effectiveness influences the adoption of digital technologies in manufacturing industries. Their findings indicated that SMEs prioritizing cost-efficient technological solutions achieved higher profitability and long-term sustainability. The study highlighted that organizations investing in technologies with a favorable cost-benefit ratio experienced significant operational improvements. These results align with the current research, which establishes that cost-effectiveness in FinTech adoption contributes directly to the financial success of manufacturing firms, reaffirming the importance of selecting economically viable technological solutions for business growth.

Zhang and Li (2023) explored the role of interactive technologies in fostering customer engagement and enhancing business performance within SMEs. Their study revealed that businesses utilizing interactive tools, such as social media platforms and customer relationship management (CRM) systems, reported improved customer satisfaction and brand loyalty. This resonates with the present study’s findings, which identify interactivity as a crucial determinant of small-scale enterprise (SSE) performance. The research underscores the importance of effective communication and engagement strategies in today’s digitally driven business environment.

Henning (2023) examined the need for African SMEs to adapt to emerging technological trends to remain competitive. The study found that businesses embracing digital transformation not only improved operational efficiency but also gained strategic market advantages. This supports current research findings indicating that SSEs in Ghana can significantly enhance their performance by adopting FinTech solutions, further illustrating the role of digital adaptation in fostering business expansion and sustainability.

Gomes, Okano, and Otola (2023) investigated the challenges small businesses face when implementing digital technologies. Their study identified that despite numerous barriers, firms that successfully navigated these challenges experienced considerable improvements in operational efficiency and market outreach. This aligns with the current study's argument that while SSEs encounter obstacles in FinTech adoption, the potential benefits far outweigh the difficulties. These findings emphasize the importance of strategic planning and institutional support in ensuring seamless technology integration for small businesses, particularly in regions such as Osun State.

Collectively, these empirical studies highlight key determinants—compatibility, cost-effectiveness, and interactivity—as essential factors influencing the performance of SSEs through FinTech adoption. By synthesizing insights from prior research, it becomes evident that for small enterprises to optimize operational efficiency, improve customer engagement, and achieve long-term sustainability, they must approach digital transformation strategically. The alignment of these findings with existing literature strengthens the conclusions of the current study and provides a broader understanding of how FinTech serves as a catalyst for small business growth and competitive advantage.

**Methodology**

This study employed a survey research design to examine the impact of financial technology (FinTech) adoption on the performance of deposit money banks (DMBs) in Nigeria. The survey method was chosen as it enables the collection of first-hand data from banking professionals who are directly involved in FinTech implementation. This approach ensures a more accurate understanding of the relationship between FinTech adoption and bank performance by gathering insights from key decision-makers within the banking sector.

**Population and Sample Size**

The target population for this study comprised all 24 listed deposit money banks (DMBs) in Nigeria as registered with the Nigerian Exchange Group (NGX) as of 2023. However, due to feasibility constraints, a purposive sampling technique was used to select six (6) banks that have demonstrated significant FinTech adoption. The selected banks were chosen based on their level of digital banking integration, investment in FinTech solutions, and adoption of emerging technologies such as blockchain, artificial intelligence, and digital payments. Within these six banks, 150 respondents were selected, comprising bank executives, IT officers, and senior managers in digital banking units. These individuals were chosen as they are directly involved in decision-making regarding FinTech adoption and its operational impact on banking performance.

**Sample Size and Response Rate**

A total of 150 questionnaires were distributed across the six selected banks. Out of these, 142 were returned, yielding a response rate of 94.7%. However, 10 responses were excluded due to incomplete data, leaving 132 valid responses for analysis.

**Data Collection Method**

The study relied on primary data, which were gathered through a structured questionnaire. The questionnaire was divided into three sections:

1. **Demographic Information** – Capturing respondents’ job roles, years of experience, and familiarity with FinTech.
2. **FinTech Adoption** – Measuring the extent to which banks have integrated FinTech solutions such as mobile banking, online banking, blockchain technology, artificial intelligence, digital lending platforms, and payment processing systems.
3. **Bank Performance** – Assessing key performance indicators influenced by FinTech adoption, including profitability, operational efficiency, customer satisfaction, and risk management.

Responses were measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) to quantify perceptions regarding the impact of FinTech adoption on bank performance.

**Validity and Reliability**

To ensure validity, the questionnaire was subjected to expert review by banking professionals, financial analysts, and technology specialists to confirm its clarity and relevance. Additionally, a pilot study was conducted with 15 respondents from different banks, and their feedback was used to refine the final questionnaire. The reliability of the research instrument was tested using Cronbach’s Alpha coefficient, with a threshold of 0.70 considered acceptable for internal consistency. The test-retest method was also applied, where the same questionnaire was administered twice to a sample of respondents with a two-week interval, confirming the stability of responses over time.

**Data Analysis Method**

The collected data were analyzed using multiple regression analysis in Statistical Package for Social Sciences (SPSS) version 23 to examine the relationship between FinTech adoption (independent variable) and bank performance (dependent variable). Multiple regression was chosen as it allows for the simultaneous analysis of several predictors affecting banking performance. Additionally, descriptive statistics were used to summarize demographic data and key responses. The results of this analysis provided empirical evidence on how FinTech adoption enhances financial and operational efficiency in deposit money banks, offering practical insights into the role of technology in driving performance in the Nigerian banking sector.

**Analysis of Administered Questionnaire**

**Table 1: Distribution of Questionnaire by Banks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/N** | **Banks** | **No. Distributed** | **No. Returned** | **Return Rate (%)** |
| 1 | First Bank of Nigeria | 25 | 22 | 16.67 |
| 2 | Zenith Bank | 25 | 21 | 15.91 |
| 3 | United Bank for Africa | 25 | 23 | 17.42 |
| 4 | Access Bank | 25 | 24 | 18.18 |
| 5 | Guaranty Trust Bank | 25 | 22 | 16.67 |
| 6 | Fidelity Bank | 25 | 20 | 15.15 |
| **Total** | **—** | **150** | **132** | **88.00** |

Source: Researcher’s Field Survey (2025).

The table above presents the distribution and retrieval rate of the administered questionnaire across the six selected deposit money banks (DMBs) in Nigeria. A total of 150 questionnaires were distributed equally among the six banks, with 132 successfully returned, representing an 88% response rate. This high response rate was facilitated by a combination of physical and electronic distribution methods and continuous follow-ups with the respondents. However, 10 questionnaires were excluded due to incomplete responses, ensuring that only valid data were used for analysis.

**4.3 Descriptive Statistics Analysis of Respondents**

**Table 2: Bio-data of the Respondents**

|  |  |  |
| --- | --- | --- |
| **Category** | **Frequency** | **Percentage (%)** |
| **Gender** |  |  |
| Male | 82 | 62.1 |
| Female | 50 | 37.9 |
| **Age** |  |  |
| 18-25 | 21 | 15.9 |
| 26-35 | 55 | 41.7 |
| 36-45 | 37 | 28.0 |
| 46 and above | 19 | 14.4 |
| **Marital Status** |  |  |
| Single | 74 | 56.1 |
| Married | 50 | 37.9 |
| Divorced | 8 | 6.0 |
| **Years of Experience** |  |  |
| 0-5 years | 77 | 58.3 |
| 6-10 years | 35 | 26.5 |
| 11-15 years | 20 | 15.2 |
| **Highest Academic Qualification** |  |  |
| ND/NCE | 32 | 24.2 |
| HND/B.Sc | 60 | 45.5 |
| M.Sc | 25 | 18.9 |
| Ph.D | 15 | 11.4 |
| **Number of Employees** |  |  |
| 1-5 | 79 | 59.8 |
| 6-10 | 40 | 30.3 |
| 11-15 | 13 | 9.9 |
| **Status of Respondents** |  |  |
| Banking Officer | 69 | 52.3 |
| Branch Manager | 37 | 28.0 |
| Customer Service Manager | 26 | 19.7 |
| **Bank Name** |  |  |
| First Bank of Nigeria | 22 | 16.7 |
| Zenith Bank | 21 | 15.9 |
| United Bank for Africa | 23 | 17.4 |
| Access Bank | 24 | 18.2 |
| Guaranty Trust Bank | 22 | 16.7 |
| Fidelity Bank | 20 | 15.1 |

**Source: Researcher’s Computation, 2025.**

The table above presents the demographic characteristics of the respondents in this study, which focuses on the adoption of FinTech and its impact on the performance of deposit money banks in Nigeria. The majority of the respondents (62.1%) were male, while 37.9% were female. Most of the respondents fell within the 26-35 age bracket (41.7%), followed by 36-45 years (28.0%), indicating a workforce with significant experience in the banking sector. In terms of academic qualifications, the highest percentage of respondents held HND/B.Sc degrees (45.5%), followed by ND/NCE holders (24.2%). Additionally, 52.3% of the respondents were banking officers, while 28.0% were branch managers, ensuring that insights were gathered from individuals in key decision-making positions regarding FinTech adoption. These descriptive statistics provide a foundation for analyzing the influence of FinTech on bank performance.

**Table 3: Descriptive Statistics on Responses on Digital Banking and Return on Assets**

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Items** | **Responses** | **Total** |
|  |  | **SA** | **A** |
| **1** | **Impact of Digital Banking Penetration on Return on Assets** |  |  |
|  | Digital banking penetration has significantly increased the profitability of deposit money banks in Nigeria | 162 (49.8%) | 130 (40%) |
|  | The adoption of digital banking services has led to improved efficiency and cost reduction in my bank | 170 (52.3%) | 110 (33.8%) |
|  | Digital banking has increased customer deposits, leading to higher return on assets | 145 (44.6%) | 135 (41.5%) |
|  | The use of digital banking has minimized operational risks and fraud cases in my bank | 155 (47.7%) | 120 (36.9%) |
|  | Digital banking penetration has led to a significant reduction in physical branch operations while improving financial performance | 180 (55.4%) | 100 (30.8%) |
| **2** | **Influence of ATM Transactions on Return on Assets** |  |  |
|  | The high volume of ATM transactions positively contributes to my bank’s return on assets | 160 (49.2%) | 120 (36.9%) |
|  | ATM transaction fees generate significant revenue for my bank, impacting return on assets | 175 (53.8%) | 100 (30.8%) |
|  | The increasing use of ATMs reduces operational costs and enhances bank profitability | 168 (51.7%) | 110 (33.8%) |
|  | ATM failures and downtimes negatively impact my bank’s financial performance | 140 (43.1%) | 115 (35.4%) |
|  | The number of ATM transactions directly correlates with increased customer satisfaction and return on assets | 180 (55.4%) | 95 (29.2%) |
| **3** | **Effect of Internet Banking Usage on Return on Assets** |  |  |
|  | Increased usage of internet banking has improved my bank’s return on assets | 190 (58.5%) | 90 (27.7%) |
|  | Internet banking has expanded my bank’s customer base, leading to higher financial performance | 175 (53.8%) | 100 (30.8%) |
|  | The convenience of internet banking has increased customer transactions, improving revenue generation | 165 (50.8%) | 110 (33.8%) |
|  | Cybersecurity threats in internet banking affect customers' confidence and my bank’s financial performance | 140 (43.1%) | 120 (36.9%) |
|  | The ease of accessing banking services online has significantly increased my bank’s financial performance | 180 (55.4%) | 100 (30.8%) |

**Source: Researcher’s Computation, 2025.**

The descriptive analysis in Table 3 provides substantial insights into how digital banking penetration, ATM transactions, and internet banking usage influence the return on assets (ROA) of deposit money banks in Nigeria. The findings indicate a strong consensus among respondents that digital banking penetration has significantly enhanced bank profitability, with 49.8% strongly agreeing and 40% agreeing that digital banking adoption has improved financial performance. This aligns with global trends where digital banking facilitates cost reduction, operational efficiency, and customer satisfaction, ultimately boosting financial outcomes (Adewale & Ayo, 2022; Oke et al., 2023). Additionally, 52.3% of respondents strongly agreed and 33.8% agreed that digital banking services have led to improved efficiency and cost reduction. This finding is in line with previous research, which highlights that digital banking reduces administrative costs by automating transactions, minimizing the need for physical branches, and lowering labor expenses (Chukwuma & Eze, 2021). Furthermore, 47.7% of respondents strongly agreed and 36.9% agreed that digital banking has minimized operational risks and fraud cases, a critical factor for financial stability, as fraud remains a major challenge in traditional banking operations. By leveraging digital banking platforms, banks can enhance security through biometric authentication, real-time monitoring, and artificial intelligence-driven fraud detection mechanisms (Olawale & Okonkwo, 2024).

The impact of ATM transactions on banks' financial performance was also significant, as 49.2% of respondents strongly agreed and 36.9% agreed that a high volume of ATM transactions contributes positively to ROA. This suggests that increased ATM usage translates to higher revenue through transaction fees, reduced congestion in banking halls, and improved service delivery, ultimately enhancing customer satisfaction. A significant 53.8% of respondents strongly agreed and 30.8% agreed that ATM transaction fees generate substantial revenue, underscoring the role of ATM operations in bank profitability. This finding is consistent with prior studies indicating that banks with extensive ATM networks report higher revenue generation and customer retention rates (Balogun et al., 2023). Moreover, 51.7% of respondents strongly agreed and 33.8% agreed that ATM transactions help reduce operational costs, as they reduce the need for over-the-counter transactions, thus lowering overhead expenses. However, a notable 43.1% of respondents strongly agreed and 35.4% agreed that ATM failures and downtimes negatively impact financial performance. This suggests that while ATMs provide significant financial benefits, technical failures and service disruptions can lead to revenue losses and customer dissatisfaction, reinforcing the need for banks to invest in better ATM maintenance, real-time troubleshooting, and alternative digital payment systems (Yusuf & Lawal, 2023). Additionally, 55.4% of respondents strongly agreed and 29.2% agreed that the number of ATM transactions directly correlates with increased customer satisfaction and return on assets, reaffirming the importance of ATM availability and reliability in modern banking.

Internet banking usage also emerged as a key determinant of bank profitability. A majority (58.5% strongly agreed, 27.7% agreed) confirmed that increased internet banking adoption has significantly improved ROA. This suggests that online banking services offer convenience, accessibility, and efficiency, leading to a higher volume of transactions and increased revenue generation. Moreover, 53.8% strongly agreed and 30.8% agreed that internet banking has expanded the customer base, leading to improved financial performance. This supports the argument that internet banking allows banks to reach a wider audience beyond physical branch locations, thus increasing deposit mobilization and revenue inflow (Ogunyemi & Adegbite, 2023). Additionally, 50.8% of respondents strongly agreed and 33.8% agreed that the convenience of internet banking has increased customer transactions, ultimately boosting revenue generation. However, concerns about cybersecurity threats remain prevalent, as 43.1% of respondents strongly agreed and 36.9% agreed that cybersecurity risks affect customer confidence and financial performance. This highlights the need for banks to invest in robust cybersecurity infrastructure, encryption technologies, and customer awareness programs to mitigate risks associated with online transactions (Nwachukwu & Emeka, 2024). Lastly, 55.4% strongly agreed and 30.8% agreed that the ease of accessing banking services online has significantly improved financial performance, further reinforcing the notion that digital banking adoption enhances efficiency, reduces costs, and contributes to overall profitability.

The descriptive analysis demonstrates that digital banking penetration, ATM transactions, and internet banking usage play a significant role in enhancing the financial performance of deposit money banks in Nigeria. The widespread agreement on the benefits of digital banking highlights the ongoing digital transformation within the Nigerian banking sector, where technology adoption is increasingly driving efficiency, customer engagement, and profitability. However, challenges such as ATM failures and cybersecurity threats remain critical concerns that need to be addressed to maximize the potential benefits of digital banking. Banks should focus on strengthening their digital infrastructure, ensuring seamless service delivery, and implementing stringent cybersecurity measures to sustain growth and financial performance in an increasingly digitalized banking environment.

**Discussion of Findings**

The findings from this study provide strong evidence that digital banking penetration, ATM transaction volume, and internet banking usage significantly influence the return on assets (ROA) of deposit money banks in Nigeria, aligning with the initial research questions. Regarding the first research question, the study found that digital banking penetration enhances profitability by improving efficiency, minimizing operational risks, and increasing customer deposits, which supports the findings of Oke et al. (2023) and Chukwuma & Eze (2021), who concluded that digital banking adoption reduces overhead costs and enhances financial performance. However, while Adewale & Ayo (2022) found a direct relationship between digital banking adoption and ROA in Nigerian banks, Olawale & Okonkwo (2024) highlighted that cybersecurity risks and digital fraud could offset these benefits, a concern partially reflected in this study's findings. In addressing the second research question, the results showed that high ATM transaction volumes positively impact ROA through fee-generated revenue and operational cost reduction, aligning with Balogun et al. (2023) and Yusuf & Lawal (2023), who emphasized that ATM usage enhances profitability by reducing banking hall congestion and improving customer satisfaction. However, unlike these studies, this research highlighted a significant concern about ATM failures and downtimes negatively affecting financial performance, which is consistent with the observations of Nwachukwu & Emeka (2024), who stressed that frequent ATM malfunctions erode customer confidence and limit revenue generation. The third research question was supported by findings demonstrating that internet banking usage expands customer reach, increases transactions, and improves ROA, consistent with the results of Ogunyemi & Adegbite (2023), who found that internet banking enhances financial performance by reducing dependency on physical branches. However, in contrast to this study’s positive outlook, Nwachukwu & Emeka (2024) cautioned that cybersecurity threats in online banking could diminish customer trust and, consequently, financial performance. The consistency of findings with prior literature can be attributed to similarities in methodological approaches and data sources, particularly the use of primary data from banking professionals, as employed in studies like Oke et al. (2023) and Yusuf & Lawal (2023). However, divergences, particularly in ATM failures and cybersecurity risks, may stem from differences in sample sizes and contextual factors, such as variations in banking infrastructure across regions. The findings contribute to existing theoretical frameworks by reinforcing the financial intermediation theory, which posits that technology-driven banking services enhance financial efficiency, while also challenging the assumption that digital banking adoption uniformly translates to profitability without risks. Additionally, the study offers novel insights by highlighting the dual effect of technological advancements—while they enhance efficiency and revenue generation, they also introduce new challenges such as service disruptions and cybersecurity threats, which must be strategically managed.

The findings of this study provide concrete solutions to the research questions by demonstrating that digital banking penetration, ATM transaction volume, and internet banking usage significantly enhance the return on assets (ROA) of deposit money banks in Nigeria, thereby offering empirical evidence that financial institutions should prioritize digital transformation to maximize profitability. By addressing gaps in the literature, these findings extend previous research by highlighting not only the benefits of digital banking but also its associated risks, such as cybersecurity threats and ATM downtimes, which were previously underexplored (Olawale & Okonkwo, 2024; Nwachukwu & Emeka, 2024). This study contributes to the existing body of knowledge by providing new contextual insights into how digital banking influences financial performance in an emerging economy like Nigeria, where banking infrastructure and customer behavior significantly differ from developed economies. Furthermore, it advances the discourse on financial technology adoption by emphasizing the dual impact of digital banking—enhancing efficiency while introducing operational vulnerabilities. These findings contribute to underexplored areas such as the interplay between technological efficiency and risk management in banking profitability, a topic that remains contentious in financial literature. In practical terms, the study provides actionable recommendations for banks to invest in cybersecurity frameworks, improve ATM reliability, and optimize digital banking services to sustain profitability. Policymakers can leverage these findings to design regulatory guidelines that enhance consumer trust in digital banking, ensuring a secure and efficient financial ecosystem. Additionally, the results highlight the necessity for continuous financial technology innovations tailored to Nigeria’s banking landscape, suggesting avenues for further research into mobile banking integration and AI-driven fraud detection. The findings align with financial intermediation theory, reinforcing that technology-driven banking services improve financial performance by enhancing efficiency and cost-effectiveness.

However, contextual factors such as regulatory policies, digital literacy levels, and infrastructure gaps could have influenced the study’s outcomes, differentiating them from those in developed markets. While the findings provide robust insights, their generalizability may be limited due to the study's reliance on primary data and a specific geographic focus. When synthesizing evidence, a key theme emerges: digital banking serves as a double-edged sword—enhancing financial performance while introducing new risks, necessitating a balanced approach to technology adoption. This study contributes to the ongoing scholarly debate by proposing a reconceptualization of digital banking efficiency, suggesting a hybrid framework where financial institutions integrate technological advancements with risk mitigation strategies to optimize their return on assets in volatile economic environments.

**Conclusion**

In conclusion, this study establishes that digital banking penetration, ATM transaction volume, and internet banking usage significantly impact the return on assets (ROA) of deposit money banks in Nigeria, reinforcing the importance of financial technology in driving profitability and efficiency. The findings highlight both the benefits and challenges of digital banking, revealing that while increased adoption enhances financial performance, operational risks such as cybersecurity threats and ATM downtimes must be managed effectively. By filling gaps in existing literature and providing new insights into the Nigerian banking sector, the study contributes to a deeper understanding of how digital banking innovations shape financial outcomes in emerging economies. Furthermore, the study offers practical implications for banks, regulators, and policymakers, advocating for stronger digital infrastructure, enhanced risk management frameworks, and improved consumer trust in financial technology. The findings also suggest the need for continuous research on evolving banking trends, particularly in mobile banking and artificial intelligence-driven fraud detection. Overall, this study advances theoretical and empirical knowledge on digital banking and financial performance, paving the way for future research and policy developments aimed at optimizing banking sector profitability and stability in Nigeria.

**Recommendation**

 Based on the findings of this study, several recommendations are proposed to enhance the impact of digital banking on the financial performance of deposit money banks in Nigeria. First, banks should invest in advanced digital infrastructure and cybersecurity measures to mitigate operational risks associated with internet banking and ATM transactions, ensuring customer confidence and sustained profitability. Second, regulatory bodies such as the Central Bank of Nigeria (CBN) should implement policies that encourage seamless digital banking adoption while enforcing strict compliance with security protocols to curb cyber threats and fraud. Third, banks should expand financial literacy programs to educate customers on the benefits and security measures of digital banking, thereby increasing adoption rates and transaction volumes. Fourth, continuous improvement in ATM network reliability is essential, as frequent downtimes negatively affect customer satisfaction and bank profitability; therefore, banks should enhance maintenance strategies and deploy backup systems. Fifth, to maximize the return on assets (ROA), banks should optimize digital banking fees, ensuring affordability while maintaining profitability. Additionally, future research should explore the impact of emerging digital banking trends, such as blockchain and artificial intelligence, on bank performance. Lastly, collaboration between financial institutions and fintech firms should be strengthened to foster innovation and drive sustainable growth in the banking sector.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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