

DIGITAL SERVICE DELIVERY AND ORGANIZATIONAL PERFORMANCE IN DEPOSIT MONEY BANKS (INDUSTRY-WIDE) IN NIGERIA.

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ABSTRACT

This study examined the effect of digital service delivery on the organizational performance of deposit money banks in Nigeria using industry-wide annual data from 2013 to 2024. The study adopted an ex post facto research design and utilized a judgmental sampling technique. Secondary data were obtained from the Central Bank of Nigeria and other official sources. Organizational performance was measured using Return on Assets (ROA) and Return on Equity (ROE), while digital service delivery was proxied by ATM transactions, MOB transactions, and RTGS transactions. Data were analyzed using descriptive statistics, correlation analysis, diagnostic tests, and Ordinary Least Squares (OLS) regression with robust standard errors. The diagnostic tests revealed the absence of heteroskedasticity and serial correlation, while the VIF value of 8.08 indicated no serious multicollinearity. The regression results showed that ATM transactions exert a significant negative effect on both ROA and ROE, whereas mobile banking transactions have a positive and significant effect on organizational performance. However, RTGS transactions were found to have no significant effect on ROA and ROE. The models explained 59.03% and 73.49% of the variations in ROA and ROE, respectively. The study concludes that digital service delivery significantly influences the organizational performance of deposit money banks in Nigeria, with mobile banking emerging as the most beneficial digital channel. The study recommends increased investment in mobile banking infrastructure, improved management of ATM-related costs, and continuous enhancement of digital banking systems to improve organizational performance and competitiveness.

Keywords: Digital Service Delivery, ATM, Mobile Banking, RTGS, Organizational Performance, ROA, ROE, Deposit Money Banks

JEL Classification: G21, L21, L86

1. INTRODUCTION

The global banking landscape has undergone remarkable transformations, largely driven by rapid technological advancements and the widespread adoption of digital service platforms. Globally, deposit money banks (DMBs) are increasingly harnessing digital technologies to improve their operational efficiency, elevate customer satisfaction, and foster sustainable corporate success. The evolution of digital services, encompassing automated teller machines (ATMs), mobile applications, online banking interfaces, point-of-sale (POS) systems, and electronic payment gateways — has revolutionized the interaction between financial institutions and their clients, leading the sector towards a more accessible and around-the-clock operational environment.

In Nigeria, the introduction of the cashless policy by the Central Bank of Nigeria (CBN, 2012) has acted as a catalyst, promoting the expansion of digital banking services among deposit money banks (Yaqub et al., 2013; Adeniyi et al., 2020). This strategic initiative is designed to diminish reliance on cash transactions and streamline banking operations, thereby enhancing the ease with which customers can access and utilize financial services. Today, banks are capitalizing on a multitude of digital platforms, which enable faster transactions, reduce operational costs, improve service quality, and sustain competitiveness in the ever-evolving banking arena. Akinwale and Kyari (2022) emphasize that the advent of digital banking technologies has significantly improved the efficiency of banking operations and broadened customer access to financial products and services. Olayemi and Abdullahi (2021) echo this sentiment, noting that digital service platforms enhance organizational productivity, increasing profitability, and bolstering customer retention within Nigeria's banking sector.

The performance of financial institutions remains a critical concern for deposit money banks, influenced by intensifying competition, changing customer expectations, and the imperative for operational sustainability. Organizational performance refers to an entity's ability to achieve its objectives effectively and efficiently by optimally utilizing available resources. In the banking sector, this performance is usually evaluated through a variety of metrics, including profitability, service quality, market share, operational efficiency, customer satisfaction, and overall productivity.

The integration of digital service delivery systems promises to leverage these performance indicators by accelerating transaction speeds, reducing waiting times, minimizing human errors, and ultimately enriching customer experience. Despite the rising adoption of digital banking services in Nigeria, several obstacles exist that impede efficient digital service delivery. Issues such as inadequate internet connectivity, lack of robust technological infrastructure, cybersecurity vulnerabilities, frequent network outages, limited digital literacy, and increasing incidence of electronic fraud can significantly impact money banks from fully reaping the benefits associated with digital service provision.

Research on digital service delivery and its impact on organizational performance has yielded mixed outcomes. Some studies suggest that digital banking services substantially enhance the operational efficiency and profitability of financial institutions (Eze & Egoro, 2020; Ibrahim & Daniel, 2023), while Okeke and Nwankwo (2021) point out that the financial burden of new technology—coupled with potential security breaches and system outages—can lead to highly unfavorable organizational outcomes. These conflicting findings underscore a notable gap in empirical research regarding the genuine effects of digital service delivery on organizational performance. Moreover, numerous studies have been constrained by limited samples of banks and varied performance indicators, resulting in inconsistencies within literature. Specifically, there is a dearth of comprehensive industry-wide evidence concerning how digital service delivery impacts organizational performance, particularly as measured by Return on Assets (ROA) and Return on Equity (ROE) among Nigerian deposit money banks, as empirical findings regarding these specific metrics remain heavily fragmented and contradictory (Eze & Egbo, 2016; Muotolu & Nwadiolor, 2019; Okeke, 2021). This study seeks to fill this critical gap by providing an extensive industry-wide analysis of the relationship between digital service delivery and its effects on ROA and ROE in the Nigerian banking sector.

2. LITERATURE REVIEW

Conceptual Review

Concept of Digital Service Delivery

Digital service delivery entails leveraging advanced electronic technologies and online platforms to provide services to customers in an efficient, convenient, and secure manner. Within the banking sector, this encompasses a suite of technological channels, including Automated Teller Machines (ATMs), mobile banking, internet banking, Point-of-Sale (POS) terminals, electronic funds transfer systems, and online customer relationship platforms. These innovations decouple service delivery from physical infrastructure, enabling seamless banking transactions without direct interaction between customers and bank personnel. Laudon and Laudon (2021) assert that digital service delivery optimizes organizational efficiency,

minimizes transactional overheads, and enhances customer satisfaction through real-time service provisioning.

The continuous evolution of Information and Communication Technology (ICT) has fundamentally restructured traditional banking paradigms into automated digital ecosystems. Consequently, deposit money banks increasingly rely on digital architecture to ensure swift and reliable service delivery. This digital migration empowers customers with uninterrupted, 24/7 access to critical financial operations, including fund transfers, utility payments, real-time account inquiries, and e-commerce transactions. As emphasized by Akinwale and Kyari (2022), strategic deployment of digital service delivery has become a critical determinant of a bank's competitive advantage and long-term sustainability in a dynamic financial market.

Architecturally, digital service delivery in banking operates as a multi-channel framework comprising mobile banking, internet banking, ATM networks, RTGS terminal transactions, and broader electronic payment gateways. While mobile and internet banking platforms offer localized transaction capabilities via personal devices and web interfaces, ATMs and POS terminals extend this ecosystem into physical retail spaces, facilitating cash management and merchant payments without necessitating branch visits. Synthetically, these channels work in tandem to optimize operational efficiency and maximize service accessibility.

In the banking sector, this includes using technological channels like automated teller machines (ATMs), mobile banking, internet banking, point-of-sale (POS) terminals, electronic funds transfer systems, and online customer service platforms. These tools make banking transactions possible without any physical interaction between customers and bank staff. According to Laudon and Laudon (2021), digital service delivery helps organizations improve their efficiency, lower transaction costs, and boost customer satisfaction through real-time services.

The growing development of information and communication technology (ICT) has changed traditional banking into digital systems. Deposit money banks now depend heavily on digital technologies to provide faster and more reliable services. Digital banking allows customers to access banking services, fund transfers, bill payments, account inquiries, and online purchases twenty-four hours a day. Akinwale and Kyari (2022) posit that digital service delivery is a crucial strategy for staying competitive and sustainable in the banking industry.

Digital service delivery in banks encompasses several aspects, including mobile banking, internet banking, ATM services, POS services, and electronic payment systems. Mobile banking lets customers perform banking tasks using their mobile devices, while internet

banking allows transactions through online platforms. ATMs make it possible to withdraw cash and perform other banking services without going into a bank branch. POS terminals enable electronic payments at stores. Together, these digital channels enhance service accessibility and operational efficiency within banks.

In this study, digital service delivery is operationalized and measured by transactions recorded in the Automated Teller Machine (ATM), mobile banking (MOB), and Real-Time Gross Settlement (RTGS) systems over the period of study.

Automated teller machines (ATMs)

Automated Teller Machines (ATMs) have long been a staple in digital banking, providing customers with easy access to cash withdrawals and balance inquiries. Although ATMs may seem like a traditional banking channel, they play a critical role in bank profitability in Nigeria by serving as a bridge between physical and digital banking (Agera, 2026). ATMs reduce the workload on in-branch tellers, allowing banks to operate with leaner staffing models and lowering operational expenses. Furthermore, the fees associated with ATM usage, including interbank transaction fees, serve as a significant revenue stream for banks (Nwoye, 2021).

Recent empirical assessments confirm that optimizing ATM network deployment significantly boosts the Return on Assets (ROA) of Deposit Money Banks (DMBs) by expanding fee-based transaction volumes and reducing the costs associated with idle assets (Agera, 2026; Gbanador et al., 2022). In recent years, Nigerian banks have expanded the functionalities of ATMs, allowing customers to pay bills, transfer funds, and even make deposits (Abdullahi, 2025). This diversification of services has enhanced customer experience, making ATMs a preferred channel for routine transactions and thereby reducing branch congestion. With improved ATM functionalities, banks encourage customers to perform transactions independently, which increases the efficiency of service delivery and, subsequently, drives up overall earnings per share (Abdullahi, 2025; Olatunde & Musa, 2022).

Mobile Banking (MOB)

Mobile banking has become the dominant digital banking channel in Nigeria, driven by the rapid expansion of smartphone penetration and enhanced internet connectivity (Ejiogu et al., 2024). This channel enables customers to perform a suite of transactions, including instant money transfers, bill payments, account inquiries, and digital loan applications, thereby shifting the banking experience from physical branches to digital interfaces.

The adoption of mobile banking significantly impacts bank profitability by optimizing cost structures and diversifying revenue streams. By migrating routine transactions to mobile

platforms, banks achieve substantial reductions in operational overheads associated with maintaining brick-and-mortar branches (Nwafor & Ojeaga, 2024). Adebisi and Adediran (2023) established that Nigerian banks prioritizing mobile infrastructure experience higher levels of customer engagement, which directly correlates with increased non-interest income from transaction fees and digital value-added services.

Furthermore, mobile banking serves as a critical distribution vehicle for innovative financial products. It allows banks to deploy micro-lending and micro-savings products directly to the customer's device, effectively capturing the unbanked and underbanked segments and contributing to interest income (Ozigbo et al., 2025). The convenience of an on-the-go banking experience is particularly critical for Nigeria's youth demographic, fostering deep brand loyalty and reducing customer churn (Chukwuma & Okoro, 2021). Sustained digital interaction creates a more stable, low-cost deposit base, which is a primary driver of long-term profitability and competitive advantage in the Nigerian banking sector (Alabi & Oladimeji, 2026).

Real-Time Gross Settlement (RTGS)

Real-Time Gross Settlement (RTGS) systems represent the apex tier of high-value digital payment architecture, shifting global banking away from traditional deferred net settlement formats to an individual, continuous, and transaction-by-transaction processing pipeline (Bech & Hobijn, 2006). By executing transfers immediately and irrevocably via central bank reserve accounts, RTGS anchors national monetary policy and corporate banking execution by removing the systemic risk of default or settlement delays (Ekpo et al., 2023; Okpala, 2026). Theoretically grounded in Expense Preference Theory and financial innovation frameworks, RTGS serves as both an efficiency tool and a risk-mitigation mechanism. By automating large-value corporate clearing, banks eliminate labor-intensive administrative workflows, lean down operational overhead, and reduce processing bottlenecks (Bech & Hobijn, 2006). Simultaneously, real-time gross settlement minimizes counterparty risks, protecting commercial banks from the liquidity traps common to deferred frameworks and stabilizing risk-adjusted capital efficiency metrics such as Return on Assets (ROA) (Okonkwo & Pius, 2026).

Empirically, the impact of RTGS and related payment innovations on bank profitability operates on a multi-dimensional continuum. On the one hand, these systems drive non-interest income, attract large corporate clients, and attract institutional investors willing to pay premium transaction fees for speed and finality, transforming high-value channels into lucrative revenue pipelines (Okonkwo & Pius, 2026). On the other hand, research highlights a distinct "maturity lag" associated with infrastructure-heavy channels. Unlike retail-facing

digital tools (such as mobile banking), systems like RTGS require substantial capital expenditures and impose strict liquidity requirements (Suotor, 2024). The Real-Time Gross Settlement (RTGS) system often imposes liquidity constraints on deposit money banks by requiring them to maintain substantial, non-interest-bearing clearing balances with the central bank. Consequently, these mandatory reserves tie up loanable funds that could otherwise be put into higher-yielding short-term credit instruments, potentially depressing overall bank profitability. Consequently, the net positive contribution of RTGS to bank earnings hinges on achieving optimal transaction velocity and navigating structural bottlenecks within emerging financial markets (Suotor, 2024).

Concept of Organizational Performance

Organizational performance refers to how well an organization meets its goals efficiently and effectively. It shows how well an organization uses its resources to achieve desired outcomes, such as profitability, productivity, market growth, customer satisfaction, and operational efficiency. In the banking sector, we often assess organizational performance using both financial and non-financial indicators. These include return on assets, return on equity, customer retention, service quality, market share, and operational productivity.

According to Richard et al. (2009), organizational performance encompasses three major dimensions: financial performance, product market performance, and shareholder return. Within deposit money banks, operational performance across these dimensions is heavily conditioned by service quality, technological innovation, and customer satisfaction. Consequently, banks that effectively leverage digital service delivery systems enhance transaction efficiency and reduce operational costs, thereby bolstering customer loyalty and financial performance. However, Kaplan and Norton (1996) pointed out that we should not measure organizational performance only by financial results. We should also consider customer satisfaction, internal business processes, and innovation capabilities. As a result, modern organizations, including banks, are increasingly embracing technology-based strategies to enhance their performance and stay competitive.

However, in this study, we operationalize organizational performance through standard accounting-based profitability metrics: Return on Assets (ROA) and Return on Equity (ROE). These indicators are vital as they capture the extent to which management efficiently utilizes its operational assets and shareholder funds to generate earnings (Ogbeide, 2020).

Theoretical Review

Technology Acceptance Theory (TAM)

The Technology Acceptance Model (TAM) was developed by Davis (1989) to explain how users come to accept and use new technologies. According to the model, two major factors determine the acceptance of technology: perceived usefulness and perceived ease of use.

Perceived usefulness refers to the extent to which an individual believes that using a particular technology will improve performance, while perceived ease of use refers to the degree to which an individual believes that using technology will require minimal effort. In the context of digital banking, customers are more likely to adopt digital services if they perceive such services as useful, efficient, reliable, and user-friendly.

The relevance of TAM to this study lies in its ability to explain customer acceptance and utilization of digital banking channels such as mobile banking, internet banking, ATMs, and POS systems. When customers adopt and use digital banking platforms, banks are likely to experience improved operational efficiency, customer satisfaction, and profitability, ultimately enhancing organizational performance.

The theory has been widely applied in studies relating to digital banking adoption and service delivery. Researchers such as Venkatesh and Davis (2000) argued that user acceptance of technology significantly influences organizational effectiveness and service performance. Therefore, TAM provides an appropriate theoretical foundation for examining the relationship between digital service delivery and organizational performance in deposit money banks in South-South Nigeria.

Diffusion of Innovation Theory

The Diffusion of Innovation Theory was founded by Rogers (2003) to explain how new ideas, technologies, and innovations spread within a social system over time. The theory identifies innovative characteristics such as relative advantage, compatibility, complexity, trialability, and observability as factors influencing technology adoption.

The theory is relevant to this study because digital banking technologies represent innovations adopted by deposit money banks to improve service delivery. Customers and organizations are more likely to adopt digital banking services when they perceive them as beneficial, compatible with existing practices, and easy to use. The successful diffusion of digital banking technologies can enhance operational efficiency, service quality, and organizational performance.

The theory further explains why some customers and banks may resist adopting digital banking due to perceived complexity, security concerns, or a lack of technological infrastructure. Thus, the Diffusion of Innovation Theory provides insight into the factors influencing the adoption and effectiveness of digital service delivery in the banking sector.

Synthesis of the Theories

The Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) Theory collectively explain how digital service delivery influences organizational performance in deposit money banks. TAM posits that customers are more likely to adopt digital banking services when they perceive them as useful and easy to use, while DOI explains how such innovations spread and gain acceptance over time. As digital banking platforms become widely adopted, banks benefit from improved operational efficiency, reduced costs, enhanced customer satisfaction, and increased transaction volumes. These benefits ultimately improve financial performance, reflected in higher Return on Assets (ROA) and Return on Equity (ROE). Therefore, the two theories provide a complementary framework for understanding how the adoption and diffusion of digital service delivery contribute to organizational performance in Nigerian deposit money banks.

Empirical Review

Eze and Egoro (2020) examined the effect of electronic banking services on the performance of deposit money banks in Nigeria using data collected from selected commercial banks. The study employed regression analysis and found that ATM services, mobile banking, and internet banking had significant positive effects on operational efficiency and customer satisfaction. The study concluded that digital banking services enhance organizational productivity and competitiveness.

Okeke and Nwankwo (2021) investigated digital banking and organizational performance in selected Nigerian banks. Using a survey research design, the study revealed that digital service delivery improved service quality and customer retention but also exposed banks to cyber security risks and operational disruptions. The study recommended increased investment in technological infrastructure and cyber security systems.

Ibrahim and Daniel (2023) studied the relationship between mobile banking services and bank performance in Nigeria. The researchers adopted a descriptive research design and analyzed responses from customers and bank employees. Findings showed that mobile banking significantly improved customer convenience, reduced transaction costs, and enhanced operational efficiency. The study concluded that digital banking services positively influence organizational performance.

Akinwale and Kyari (2022) examined the impact of internet banking on customer satisfaction and profitability in Nigerian deposit money banks. The study used panel data analysis and found that internet banking services significantly contributed to profitability growth and customer retention. The researchers emphasized the importance of continuous technological innovation in sustaining bank performance.

Nwarisi et al. (2022) assessed digital banking services and business performance in the Nigerian banking sector. The study revealed that electronic payment systems and online banking services improved service delivery efficiency and organizational productivity. However, the study identified network instability and electronic fraud as major challenges affecting effective digital service delivery.

Similarly, Wadesango and Magaya (2020) examined digital banking and organizational efficiency in African financial institutions. The study found that digital technologies improved transaction speed, operational effectiveness, and customer experience. However, the researchers observed that poor digital infrastructure and low technological literacy hindered the effectiveness of digital banking services in developing countries.

Despite the numerous studies on digital banking and organizational performance, existing literature reveals several gaps. Most studies focused on specific digital banking channels such as ATM services or mobile banking without examining digital service delivery comprehensively. Many studies also concentrated on national-level analysis without adequate attention to regional contexts such as South-South Nigeria. Furthermore, inconsistencies in empirical findings regarding the effect of digital service delivery on organizational performance indicate the existence of an empirical gap requiring further investigation. Therefore, this study seeks to bridge these gaps by examining the relationship between digital service delivery and organizational performance in deposit money banks in South-South Nigeria.

Development of Hypothesis

Digital service delivery and organizational performance

Digital service delivery has become an important strategy for improving organizational performance in the banking sector. Deposit money banks utilize digital platforms such as mobile banking, internet banking, automated teller machines (ATMs), and Real-Time Gross Settlement (RTGS) systems to enhance service efficiency, customer satisfaction, operational effectiveness, and profitability. The adoption of these technologies enables banks to provide faster, more convenient, and cost-effective services to customers. Empirical studies have shown that digital service delivery positively influences organizational performance. Eze and

Egoro (2020) found that electronic banking services improved operational efficiency and customer satisfaction in Nigerian banks. Similarly, Ibrahim and Daniel (2023) reported that mobile banking significantly enhanced customer convenience and organizational productivity. The Technology Acceptance Model (TAM) further explains that customers are more likely to adopt digital banking services when they perceive them as useful and easy to use, thereby improving organizational outcomes. However, some studies argue that challenges such as cybersecurity threats, network failures, electronic fraud, and high technological costs may limit the effectiveness of digital service delivery in enhancing organizational performance (Okeke & Nwankwo, 2021). Based on the inconsistencies in previous findings, the study hypothesizes as follows:

H₀: Digital service delivery has no significant relationship with organizational performance of deposit money banks in Nigeria.

3. METHODOLOGY

This study adopts an ex-post facto research design, as the study relies on historical data obtained from the CBN database. The research population consists of 19 licensed deposit money banks in Nigeria as of December 31, 2024, as verified by the Nigeria Deposit Insurance Corporation. The selected study period spans 2013 to 2024, providing significant study trends. The study used an industry-wide sample. Data were from the Central Bank of Nigeria (CBN) database, and the empirical analysis employed simple linear regression. This approach is justified in this context as it enables the assessment of the relationship between several independent variables, namely the various indicators of digital banking, and the dependent variable, which is the profitability of deposit money banks. The study aims to determine the extent to which each element of digital banking, namely Automated Teller Machines (ATM), Real-Time Gross Settlement (RTGS), and mobile banking (MOB) systems, contributes to the variation in profitability measured by Return on Assets (ROA) and Return on Equity (ROE) using multiple regression analysis.

Variables Measurement and Model Specification

The study used ATM, MOB, and RTGS as proxies for the independent variable, digital service delivery (digital banking), while the dependent variable, profitability, is measured using Return on Assets (ROA) and Return on Equity (ROE). These metrics measure the efficiency with which banks use their assets to create profits.

Table 1. Variable Definition

S/N	Variables	Proxy	Type	Measurement	Source
1.	Profitability	ROA	Dependent	As reported	CBN Data & Statistical Repository
		ROE	Dependent	As reported	
2	Digital Banking	ATM	Independent	As reported	
		RTGS	Independent	As reported	
		MOB	Independent	As reported	

The model for the study is specified as follows:

$$OP_{it} = f(DSD_{it})$$

Expanded as:

$$ROA_{it} = \psi_0 + \psi_1 MB_{it} + \psi_2 ATM_{it} + \psi_3 RTGS_{it} + \mu_{it}$$

$$ROE_{it} = \psi_0 + \psi_1 MB_{it} + \psi_2 ATM_{it} + \psi_3 RTGS_{it} + \mu_{it}$$

Where:

OP = Organizational Performance

DSD = Digital Service Delivery

ROA = Return on Assets

ROE = Return on Equity

MB = Mobile Banking

ATM = Automated Teller Machine Services

RTGS = Point-of-Sale Services

ψ_0 = value of the intercept.

$\psi_1 - \psi_4$ = Regression Coefficients

μ = Error Term.

i = Industry

t = Period/Time

4. DATA ANALYSIS AND DISCUSSION

Table 2. Descriptive Statistics

Var	Obs	Mean	Std. Dev.	Min.	Max
ROA	12	.0205833	.0068684	.013	.035
ROE	12	.2224167	.1198108	.111	.48
LnATM	12	29.81729	.8383724	28.68844	31.11681
LnMOB	12	29.31091	2.611508	25.68471	33.02374
LnRTGS.	12	28.57868	3.826866	25.43684	34.0081

Researcher's Computation; STATA15.1 output

Table 2 presents the descriptive statistics of the variables used in the study. The results show that ROA recorded a mean value of 0.0206 (2.06%) with a standard deviation of 0.0069, indicating that the Nigerian deposit money banking industry maintained relatively stable profitability from its asset base during the study period. Similarly, ROE had an average value of 0.2224 (22.24%), suggesting that shareholders earned an average return of about 22% on their investments. However, the higher standard deviation of 0.1198 indicates greater fluctuations in shareholders' returns over the years.

Regarding the digital banking variables, LnATM recorded a mean of 29.8173 and a low standard deviation of 0.8384, indicating relatively stable growth in ATM transactions. LnMOB had a mean value of 29.3109 with a standard deviation of 2.6115, suggesting moderate variability and increasing adoption of mobile banking services. Similarly, LnRTGS recorded a mean of 28.5787 and the highest standard deviation of 3.8269, indicating substantial fluctuations in RTGS transactions during the period.

Overall, the descriptive statistics suggest that the banking industry maintained positive profitability levels while digital banking channels, particularly mobile banking and RTGS, experienced notable growth and variation, reflecting the increasing digitalization of banking services in Nigeria.

Table 4 Correlation of variables

	ROA	ROE	LnATM	LnMOB	LnRTGS
Return on assets (ROA)	1.0000				
Return on equity (ROE)	0.9610	1.0000			
		0.0000			
LnATM	0.1926	0.3537	1.0000		

	0.5486	0.2594			
LnMOB	0.4405	0.6062	0.9356	1.0000	
	0.1518	0.0367	0.0000		
LnRTGS	0.2805	0.3662	0.8992	0.8724	1.0000
	0.3765	0.2417	0.0001	0.0002	

Source: STATA15.1

The correlation matrix presents the degree and direction of association among the study variables. The results show that ROA and ROE are strongly and positively correlated ($r = 0.9610$, $p < 0.01$), indicating that improvements in asset profitability are associated with higher returns to shareholders. This strong relationship is expected since both variables measure financial performance.

The relationship between ROA and the digital banking variables is positive but weak. Specifically, ROA is positively correlated with LnATM ($r = 0.1926$), LnMOB ($r = 0.4405$), and LnRTGS ($r = 0.2809$), although these relationships are statistically insignificant. This suggests that increases in digital banking activities are associated with improvements in profitability, but the relationships are not strong enough to be statistically meaningful at this stage.

Similarly, ROE exhibits positive correlations with LnATM ($r = 0.3537$), LnMOB ($r = 0.6062$), and LnRTGS ($r = 0.3662$). Among these, the relationship between ROE and mobile banking transactions is statistically significant ($p = 0.0367$), indicating that increased mobile banking activities are associated with higher returns to shareholders. Among the independent variables, very strong positive correlations exist between LnATM and LnMOB ($r = 0.9356$), LnATM and LnRTGS ($r = 0.8992$), and LnMOB and LnRTGS ($r = 0.8724$). These high correlations suggest that the digital banking channels tend to grow together over time, reflecting the increasing adoption of electronic banking services within the Nigerian banking industry.

Overall, the correlation results indicate positive associations between digital banking channels and financial performance. However, the high correlations among the independent variables suggest the possibility of multicollinearity. Consequently, the Variance Inflation Factor (VIF) test was conducted to provide a more reliable assessment of multicollinearity before proceeding with regression analysis.

Diagnostic Tests

The following tests were conducted to improve reliability of inferences, Multicollinearity Test, Heteroskedasticity Test, and Serial Correlation Test (Autocorrelation).

Table 3 Diagnostic Tests Outputs Summary

Diagnostic Tests	Model	Test Statistics	p-Value	Decision	Conclusion
Heteroskedasticity (Breusch-Pagan/Cook-Weisberg Test)	ROA	Chi2(1) =0.28	0.5957	P>0.05-No heteroskedasticity	Not Present
	ROE	Chi2(1) =0.48		P>0.05-No heteroskedasticity	
Multicollinearity (VIF Test)	ROA	Mean VIF = 8.08	-	Vif <10: No Serious Multicollinearity	Acceptable
	ROE		-		
Autocorrelation Correlation (Breuch-Godfrey LM test)	ROA	Chi2 =0.022, df=1	0.8824	P>0.05	Absent at 5% level
	ROE				

Source: STATA 15

From Table 3, the diagnostic tests confirm the suitability of the OLS estimator for the study. The Breusch-Pagan/Cook-Weisberg test produced insignificant p-values ($p > 0.05$) for both the ROA and ROE models, indicating the absence of heteroskedasticity and suggesting that the error terms have constant variance. The VIF test yielded a mean value of 8.08, which is below the threshold of 10, indicating that multicollinearity is not severe and does not pose a threat to the reliability of the regression estimates. Similarly, the Breusch-Godfrey LM test returns a p-value of 0.8824, which exceeds 0.05, confirming the absence of serial correlation in the residuals. Overall, the results indicate that the models satisfy the key assumptions of OLS regression, thereby supporting the reliability and validity of the estimated results.

Regression Analysis

The study employed the Ordinary Least Squares (OLS) Robust Standard Error regression technique to examine the effect of digital banking channels on the financial performance of deposit money banks in Nigeria. The choice of OLS was informed by the results of the diagnostic tests, which revealed the absence of heteroskedasticity, serial correlation, and severe multicollinearity (Wooldridge, 2020; Gujarati & Porter, 2009). Furthermore, given the

industry-wide time-series nature of the data spanning 14 observations, OLS serves as a parsimonious and robust technique that preserves crucial degrees of freedom, avoiding the risks of overparameterization inherent in more complex models when dealing with small sample sizes (Brooks, 2019)

Table 4: OLS Robust Standard Error Regression

Variables	Model 1 (ROA)	Model 2 (ROE)
	Coef. (t-stat)	Coef. (t-stat)
LnATM	-0.0157 (-7.00) ***	-0.2339 (-7.17) ***
LnMOB	0.0053 (5.41) ***	0.1025 (7.54) ***
LnRTGS	0.0004 (0.49)	-0.0035 (-0.28)
Constant	0.3200 (4.78) ***	4.2919 (4.35) ***
R ²	0.5903	0.7349
F-statistic	68.34***	131.29***
Prob > F	0.0000	0.0000
Observations	12	12

Notes: Robust standard errors were used. Values in parentheses are t-statistics. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4 presents the OLS regression results examining the effect of digital banking channels on the financial performance of deposit money banks in Nigeria, measured by Return on Assets (ROA) and Return on Equity (ROE). The results indicate that both models are statistically significant, with F-statistics of 68.34 and 131.29 and probability values of 0.0000, implying that the explanatory variables jointly influence financial performance. The R² values of 0.5903 and 0.7349 indicate that approximately 59.03% and 73.49% of the variations in ROA and ROE, respectively, are explained by the digital banking variables.

The results show that ATM transactions (LnATM) have a negative and statistically significant effect on both ROA ($\beta = -0.0157$, $p < 0.01$) and ROE ($\beta = -0.2339$, $p < 0.01$). The result suggests that increased reliance on ATM services is associated with lower financial performance. A possible explanation is that the costs associated with ATM deployment, maintenance, security, and network infrastructure may outweigh the revenue benefits generated from ATM transactions.

In contrast, mobile banking transactions (LnMOB) exert a positive and statistically significant effect on both ROA ($\beta = 0.0053$, $p < 0.01$) and ROE ($\beta = 0.1025$, $p < 0.01$). This finding implies that increased adoption and usage of mobile banking services enhance bank profitability and shareholder returns. The result reflects the efficiency, convenience, and cost-

saving benefits associated with digital financial services, which contribute positively to bank performance.

The coefficient of RTGS transactions (LnRTGS) is statistically insignificant in both models. Although the variable is positively related to ROA and negatively related to ROE, the effects are not significant at conventional levels. The result suggests that RTGS activities did not have a meaningful influence on the financial performance of deposit money banks during the study period.

Overall, the findings indicate that while mobile banking contributes significantly to improved financial performance, ATM transactions are associated with lower profitability, whereas RTGS transactions do not significantly affect bank performance. The results underscore the growing importance of mobile banking as a driver of financial performance in Nigeria's banking industry.

Discussion of Findings

The descriptive statistics indicate that the Nigerian deposit money banking industry maintained positive profitability throughout the study period, as reflected by the average ROA of 2.06% and ROE of 22.24%. While ROA remained relatively stable, ROE exhibited greater fluctuations, suggesting variations in shareholders' returns over time. The digital banking variables also recorded considerable activity, with mobile banking and RTGS transactions showing greater variability than ATM transactions. This finding reflects the increasing adoption of digital financial services and the growing role of technology-driven banking operations in Nigeria. These findings support the observations of Eze and Egoro (2020) and Wadesango and Magaya (2020), who reported that digital banking technologies have become central to improving banking operations and service delivery.

The correlation analysis revealed a strong positive relationship between ROA and ROE ($r = 0.9610$, $p < 0.01$), indicating that improvements in asset profitability are associated with higher returns to shareholders. The results also showed positive relationships between the digital banking variables and financial performance, particularly between mobile banking and ROE ($r = 0.6062$, $p < 0.05$). This finding suggests greater use of digital banking channels is associated with improved bank performance and aligns with Ibrahim and Daniel (2023), who found that mobile banking enhances operational efficiency and organizational performance. Although the digital banking variables were highly correlated, the VIF value of 8.08 remained below the threshold value of 10, indicating that multicollinearity was not severe enough to distort the regression estimates (Gujarati & Porter, 2009).

The regression results revealed that the models were statistically significant, with the explanatory variables accounting for 59.03% of the variation in ROA and 73.49% of the variation in ROE. The findings showed that ATM transactions (LnATM) have a negative and statistically significant effect on both ROA and ROE. This result implies that increased ATM transactions are associated with lower financial performance, possibly because the costs of ATM deployment, maintenance, security, and cash management outweigh the financial benefits generated from ATM operations. This finding contrasts with Eze and Egoro (2020), who found that ATM services positively influence bank performance through improved service delivery and customer satisfaction. It also contradicts the findings of Okafor and Udeh (2023), who reported a positive contribution of ATM services to bank profitability. However, the result supports Akinwale and Adeyemi (2024), who argued that the substantial operational costs associated with digital infrastructure may negatively affect profitability.

The results further revealed that mobile banking transactions (LnMOB) exert a positive and statistically significant effect on both ROA and ROE. The result suggests that increased adoption of mobile banking enhances bank profitability by reducing transaction costs, improving service delivery, and increasing customer convenience. The finding is consistent with Ibrahim and Daniel (2023), who found that mobile banking improves operational efficiency and organizational performance. It also supports the studies of Eze and Egoro (2020), Nwarisi et al. (2022), and Adegbite et al. (2025), which reported that digital banking services positively contribute to organizational productivity, profitability, and service quality. The finding further aligns with the Technology Acceptance Model, which posits that the adoption of useful technologies improves organizational outcomes.

The results also indicate that RTGS transactions (LnRTGS) have an insignificant impact on ROA and ROE. The result suggests that although RTGS facilitates efficient and secure large-value transactions, it does not significantly contribute to bank profitability during the study period. The finding supports Eze and Nnamani (2023), who concluded that some digital payment channels contribute more to operational efficiency than direct financial performance. However, it contradicts Ibrahim and Yusuf (2024), who found a significant positive relationship between RTGS transactions and bank profitability.

Overall, the findings demonstrate that digital banking channels influence financial performance in different ways. While mobile banking significantly improves profitability, ATM transactions reduce profitability, and RTGS transactions do not significantly affect performance. The findings support the views of Okeke and Nwankwo (2021), Nwarisi et al. (2022), and Wadesango and Magaya (2020), who argued that digital banking enhances organizational efficiency and competitiveness but may also introduce operational costs,

technological challenges, and security concerns that affect performance outcomes. Therefore, the study underscores the importance of strengthening mobile banking services while ensuring that investments in ATM infrastructure and other digital platforms are cost-effective and strategically managed to maximize organizational performance.

5. CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the effect of digital service delivery on the organizational performance of deposit money banks in Nigeria using industry-wide annual data from 2013 to 2024. The diagnostic test results confirmed the absence of heteroskedasticity and serial correlation, while the VIF value of 8.08 indicated no serious multicollinearity, supporting the suitability of the OLS estimator. The findings revealed that ATM transactions exert a significant negative effect on ROA and ROE, mobile banking transactions have a significant positive effect, while RTGS transactions have no significant effect on organizational performance.

The findings support Diffusion of Innovation theory, which posits that innovations perceived as beneficial are adopted more readily and yield positive outcomes. The significant positive effect of mobile banking suggests that customers and banks have increasingly adopted it for its convenience, accessibility, and efficiency, causing improved organizational performance.

The results support the Technology Acceptance Model (TAM), which holds that perceived usefulness and ease of use drive technology adoption. The positive effect of mobile banking suggests customers view mobile platforms as useful and easy to use, boosting adoption and enhancing bank performance. Conversely, the negative impact of ATM transactions implies that the benefits of ATM services may be outweighed by their operational and maintenance costs, thereby reducing their net contribution to bank performance.

Furthermore, the findings align with the Technology–Organization–Environment (TOE) Synthesis Theory, which emphasizes that technological innovations create value only when supported by adequate organizational capabilities and environmental conditions. The positive effect of mobile banking shows that effective technological deployment can enhance performance. The insignificant effect of RTGS suggests that not all digital technologies automatically improve profitability unless they are effectively integrated into organizational strategy and value-creation processes.

Overall, the study concludes that digital service delivery significantly influences the organizational performance of deposit money banks in Nigeria, although the effects vary across digital banking channels. Mobile banking emerged as the most effective digital

platform for enhancing profitability, underscoring the need for continued investment in customer-oriented, cost-efficient digital technologies.

Recommendations

1. Deposit money banks should increase investment in mobile banking platforms to enhance service delivery, customer satisfaction, and profitability.
2. Banks should review and optimize the cost structure of ATM operations to ensure that the benefits derived from ATM services outweigh their operational costs.
3. Management should explore strategies for improving the profitability contribution of RTGS services through innovative value-added offerings.
4. Banks should continue investing in digital infrastructure and cybersecurity systems to maximize the benefits of digital service delivery and sustain organizational performance.

Competing Interest: The authors declare that there is no competing or conflicting interest in this manuscript.

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