

IMPACT OF FINANCIAL TECHNOLOGY ON THE PERFORMANCE OF DEPOSIT MONEY BANKS (DMBs) IN KATSINA METROPOLIS

Olatoke Taofiq

Federal University Dutsin-ma, Katsina State, Nigeria.
otaofiq@fudutsinma.edu.ng

Idris Halliru

Umaru Musa Yar'adua University, Katsina State, Nigeria.
idris.halliru@umyu.edu.ng

Dr Ahmad Abubakar

Federal University Dutsin-ma, Katsina State, Nigeria
aabubakar@fudutsinma.edu.ng

Abstract

The main objective of this study is to examine the impact of financial technology on the performance of deposit money banks (DMBs) in Katsina metropolis. The study adopted cross-sectional survey research design utilizing questionnaire as the research instrument. The population of the study comprised the 120 staff of the 20 DMBs in Katsina metropolis. Given the small size of the population, a census study was adopted. The data used for the study were analyzed by simple percentage, ANOVA and Multiple Linear Regression Analysis (MLRA). Findings indicate that all the three indicators of financial technology, that is, Automated Teller Machine (ATM), Point of Sale (POS), and Mobile Banking (MB) have a significant positive impact on deposit money bank's performance. The study therefore concludes that ATMs, POS and MB are crucial drivers of bank operational performance. Therefore, the study recommends those DMBs banking services should be enhanced by upgrading ATM infrastructure and mobile banking features to improve reliability, security and user experience. The adoption of advanced technology should be promoted by increasing awareness campaigns about its commercial benefit for both merchants and customers. DMBs should integrate digital channels into a unified customer satisfaction, enabling personalized services, fraud detection and cross-platform transactions.

Keywords: Automated Teller Machine, Point of Sale, Mobile Banking, Deposit Money Banks and Operational Performance.

Introduction

Financial Technology (FinTech) has revolutionized the banking sector by increasing operational efficiency, reducing cost, and improving customer experience through the use of mobile and online electronic tools such as cloud-computing, mobile and online banking to facilitate transactions (Arnaut & Bećirović, 2023). This has increased competition in Nigeria, where Deposit Money Banks (DMBs) are under pressure from competitors and unfavorable environmental regulatory framework. FinTech adoption has accelerated, but there's limited empirical evidence on

its specific impact on operational performance in Katsina metropolis where prior studies focus on advanced economies, overlooking local opportunities and challenges in developing economies.

The study addresses that knowledge gap by providing localized analysis of FinTech's influence on DMBs in Katsina metropolis. Nonetheless, there were still operational challenges, resistance to change, skill shortages, high technological upgrade cost, cyber security risk, and regulatory pressures (Gomber, et al., 2018). These factors may affect service delivery and temper with customer trust. Guided by these concerns, the study tested the following hypothesis:

- i. Ho: There is no significant impact of ATM on the operational performance of DMBs in Katsina metropolis.
- ii. Ho: There is no significant impact of POS on the operational performance of DMBs in Katsina metropolis.
- iii. Ho: There is no significant impact of MB on the operational performance of DMBs in Katsina metropolis.

Financial technology

The phrase "financial technology" (FinTech) refers to a broad category of innovations and applications that use digital technology to deliver financial services. These include block-chain applications, Automated Teller Machines (ATM), Point of Sale (POS) systems, mobile and online banking, artificial intelligence (AI), and machine learning algorithms (Okoye & Ezze, 2022; World Bank, 2022). Through the provision of faster, more efficient, and more secure financial services, FinTech is transforming traditional banking operations for banks and other financial institutions. The implementation of FinTech has become more and more essential to the operations success of Deposit Money Banks (DMBs). For Examples, Customers can use ATMs to conduct routine task like cash withdrawals and checks without going to banking hall. By enabling real-time electronic payments, point-of-sale (POS) systems promote cashless transactions. Online and mobile banking platforms enable 24/7 account access and transaction execution from nearly everywhere, simplifying transactions and reducing traffic at physical branches (CBN 2023; Uche & Ibrahim, 2020).

According to Kagan (2020), financial technology (FinTech) is used to describe new technology that seeks to improve and automate the delivery and use of financial services. At its core, FinTech is utilized to help companies; business owners and consumers better manage their financial operations by utilizing specialized software that are used on computers.

According to Schüffel (2016), Fintech refers to computer software and other technology employed to support banking and financial service delivery. The Financial Technology definition used in this study draws essentially from the one given by the Schüffel (2016). These are represented by ATM, POS Terminal, and Mobile Banking. In this context, operational performance refers to how

effectively and efficiently a financial institution executes its internal processes to deliver value to its customers. In this regard, customer satisfaction, system uptime, cost reduction, transaction processing speed, and service delivery quality are typically considered key performance indicators (KPIs) (Adebayo, 2021; Musa & Bello, 2022). Rapid change in technology in the payments system has increased financial inclusion thus changing the trend of undertakings of the traditional banking system (Mutua, 2013).

Consequently, it is evident that FinTech plays a crucial role in determining operational outcomes in contemporary banking, particularly in developing countries like Nigeria where infrastructure development and service delivery remain significant challenges.

Mobile Banking

According to Olorunsegun, (2010), Mobile banking refers to systems that enable bank customers to get access to their accounts and general information on bank products and services through the use of bank's website, without the intervention or inconvenience of sending letters, faxes, original signatures and telephone confirmations. Siyanbola (2013) puts it that mobile banking involves engaging in banking transactions using computers or mobile devices without visiting the banking hall. E-commerce is greatly facilitated by mobile banking and is mostly used to effect payment. Mobile banking also uses the electronic card infrastructure for executing payment instructions and final settlement of goods and services between the merchants and the customers. Commonly used mobile banking transactions in Nigeria are settlement of commercial bills and purchase of air tickets through the websites of the merchants. Level of awareness of the advantages of this product to the saving populace is still very low; hence, there is every room for improvement if cashless banking would be effective as expected Siyanbola, (2013). Funds transfer, airtime top up, balance enquiry, password change, bill payment etc. can also be conducted on the mobile banking platform.

Automatic Teller Machine (ATM)

Automated Teller Machines (ATMs) have revolutionized banking in Nigeria by enabling 24/7 access and empowering consumers to perform operations like withdrawals, balance inquiries, and fund transfers without the help of bank employees or going to the bank premises. Notwithstanding these advantages, there are still problems, such as long queues, long wait times, poor user awareness, technical difficulties, and service outages. Ayimey et al. (2012) emphasized the need for customer education and technical advancements to improve satisfaction and usability, while Olu (2019) suggested installing more ATMs to cut down on wait times using queuing theory.

Point of Sale

The Point of Sale (POS) system allows customers to transfer funds instantly from their bank accounts to merchants during trade using machines and electronic cards. POS enhances banking efficiency by replacing traditional checks and cash handing with faster electronic transactions (Chorofas, 2018). Bank performance, as measured by its financial statement, is the degree to which banks achieve its objectives over a specified period of time. The ability of the bank to achieve the objectives set by management and shareholders should be the basis for evaluating performance as stated by Rose (2001). Profitability, deposit volume, and bank size are more accurate indicators of the market than stock prices (Salehi & Alipour, 2014).

Operational Performance

To provide financial services and achieve strategic objectives, banks must manage their internal resources, processes, and technologies in an efficient, effective, and dependable manner. This is what operational performance entails in the banking sector (Okoye & Eze, 2022). Key performance metrics include cost efficiency, service uptime, transaction speed, staff productivity, and customer satisfaction. Particularly for Deposit Money Banks, metrics such as transaction turn-around time, queue management, error rates, system outages, and responsiveness to customer inquiries are frequently employed (Musa & Bello, 2020). FinTech and digital platforms, such as internet and mobile banking, greatly enhance operational performance by automating procedures, improving round-the-clock access, and reducing reliance on physical branches (Adebayo, 2021; CBN, 2023). ATMs and POS terminals are financial tools that can further strengthen streamlined operations, minimizing branch congestion. Additionally, banks that utilize AI, big data, and cloud systems gain from better tracking performance metrics, personalized service delivery, and real-time decision-making (WB, 2022), all of which contribute to higher productivity, customer satisfaction, and competitiveness.

Theoretical Framework

Technology Acceptance Model (TAM)

Technology acceptance model was originally developed by Davis (1989), the ATM is a foundational theory explaining how users adopt new technologies. It posits that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) determine a user's intention to use a technology, which in turn predicts actual usage. In the context of financial institutions, TAM helps describe both employee and customer adoption of FinTech tools such as ATMs, POS, the Internet and mobile banking. When bank staff perceive these tools as beneficial for enhancing efficiency and easy to operate, they are more likely to adopt and support those (Ayo et al., 2016). Likewise, customers are more inclined to use digital banking platforms when they find them user-friendly and capable of meeting real-time

financial needs (Akinwale & Dada, 2019). However, TAM provides a dual viewpoint on how internal (bank employees) and external (customers) stakeholders influence the operational performance of DMBs through FinTech adoption.

Resource -Based view (RBV): Adopted to support the study. This theory was first labeled by Edith Penrose in her work from 1954. Although, the framework which is consistent with the previous studies became widely recognized and influential in strategic management through Jay Barney's pivotal article, "Firm Resources and sustained Competitive advantage," published in 1991. This framework focuses on the internal resources and capabilities of a deposit bank such technology infrastructure, digital platform, and innovative processes, and how these resources contribute to competitive advantages and improved performance.

Empirical Studies

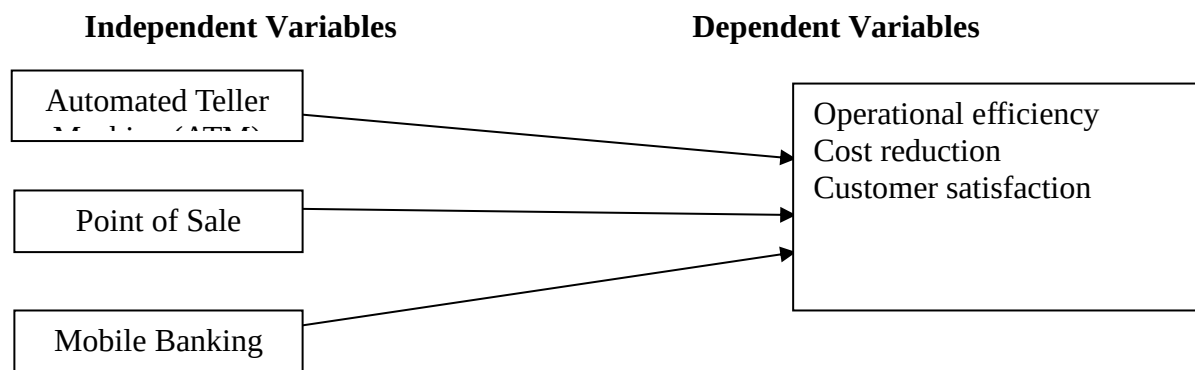
The study reviewed some previous relevant studies thus, establishing a foundation for the study. Okoye et al., (2024) investigated financial technology and the performance of firms in Nigeria. Using ex-post facto research design, the finding revealed that financial technology has a significant impact on the performance of small and medium enterprises in Nigeria. The result revealed that ATM and POS transactions have positive impact while Mobile Banking transactions have negative impact on the performance of commercial banks in Nigeria.

Ologunwa et al. (2024) investigated the effect of financial technology on financial performance of deposit money banks in Southwest, Nigeria. The study employed Ex-Post Facto research design to establish the functional relationship among customers and employees of the DMBs branches in the South West geopolitical zone in Nigeria. The results showed that the deployment of automated teller machine, mobile banking, mobile banking and point of sales on the financial performance of banks have significantly and positively improved DMBs' return on asset, equity, and the net income. A study by Nwankwo et al., (2023) on the effect of financial technology on the profitability of Deposit Money Banks (DMBs) in Nigeria, using an ex-post facto design, found that mobile banking had a positive and significant impact on profitability while ATM usage showed a positive but non-significant effect. Though, both internet banking and POS operations had negative but non-significant effects on DMB profitability.

Similarly, Adebayo (2021) examined the impact of FinTech regulation on DMB performance using survey data from 220 bank employees across five DMBs in Ilorin. The study found that FinTech platforms had a strong positive and statistically significant effect on bank performance at the 5% significance level, highlighting the critical role of regulatory support in enhancing FinTech-driven banking outcomes.

In most of the previous studies an ex-post facto research design was employed often combining quantitative and qualitative methods. However, this study adopts purely quantitative approach to examine the impact of FinTech on the performance of deposit money banks addressing both a methodological and geographical gap by specifically focusing Katsina metropolis, a region often overlooked in existing research, which intends to concentrate on national or more developed nations.

Conceptual Framework



Developed by the Authors' (2024)

Methodology

The study adopts cross-sectional research design and focus on 20 deposit money banks (DMBs) in Katsina metropolis. The target respondents include top and middle management, IT staff, customer service representatives and compliance officers, totally 120 staff members across six departments. Due to the small population size, a census approach was used. ATM, Point of Sale (POS) and Mobile banking were selected as the FinTech indicators, following methodologies used by Adiga et al. (2022) and Ibekwe (2021). Metrics for FinTech and operational performance were drawn from recognized scales such as eBankQual (Kumbhar, 2012), SERVQUAL dimensions (Ndubisi, 2006), and bank profitability metrics (Athanasoglou et al., 2008).

To assess operational performance, the study adopted the three-dimensional operational efficiency model by Abdullahi and Micheni (2018), focusing on operational efficiency, cost reduction, customer satisfaction as key performance proxies. Data used for the study were analysed by ANOVA and Multiple Linear Regression Analysis (MLRA) using Statistical Package for the Social Science (SPSS) software version 22.

Model Specification

The model for the study is specified thus:

$$Y = \beta_0 + \beta_1 \text{ATM} + \beta_2 \text{POS} + \beta_3 \text{MB} + e$$

Y = Deposit Money Bank Operational performance (dependent variable)

β_0 = the Y intercept parameter

$\beta_1 - \beta_3$ = Slope parameters (measures the degree of responsiveness of the dependent variable to the independent variables X1 = independent variable (ATM), X2 = independent variable (POS), X3= independent variable (Mobile banking).

e = error term (5%= 0.05)

Results and Discussion

Out of 120 questionnaires administered, 115 were completed and returned correctly, resulting in a response rate of 95.83%. This high response rate suggests that the sample size is sufficient to provide reliable and valid result for the study.

Diagnostic Tests

Diagnostics tests are conducted to ensure that the results are not biased and also to prevent the violations of the major assumptions of regression model. Consequently, reliability test, normality test, collinearity test and autocorrelation test are diagnostic tests presented and discussed in this sub-section. In order to ensure that the study scales maintain internal consistency, reliability test in the form of Cronbach's alpha was conducted. Table 1 presents the results of the Cronbach's alpha used for the reliability test

Table 1: Reliability Test

Variables	Cronbach's Alpha	Number of Items
POS	0.836	3
ATM	0.752	3
Mobile Banking	0.767	3
Operation Efficiency	0.761	3
Cost reduction	0.717	3
Customer satisfaction	0.850	3

Source: Authors' Computation (2024) using SPSS

The results of the reliability test in table 1 reveal all the variables have Cronbach's alpha coefficients above the minimum acceptable level of 0.70 in line with (Hair et al., 2010). Following the reliability test results, it can be inferred that the questionnaire instruments are adequate as a measure of internal consistency.

To ensure that normality assumption of regression model is not violated, we conducted normality using Skeweness and Kurtosis. In table 2 the results of the normality test is shown below

Table 2: Normality Test

Variables	Skweness	Kurtosis
POS	-1.660	6.204
ATM	-1.51	0.311
Mobile banking	-1.224	2.020
Operational efficiency	-1.78	-0.248
Cost reduction	-0.884	-0.002
Customer satisfaction	-1.531	4.886

Source: Authors' Computation (2024)

None of the skeweness and kurtosis values in table 2 are greater than two and seven, respectively. In accordance with (West et al., 1995), the satisfaction of these requirements suggests that the variables are normal and that the Regression model's normality assumption is not broken. The table shows that each independent variable's tolerance statistics are over 0.1 and that the VIFs that go along with them are much less than 10. According to Harun (2020) and Marzuki et al. (2020), these two conditions suggest that multi-collinearity is absent. The Durbin-Watson (D-W) statistic is used to quantify the autocorrelation test in addition to the normality test. As noted by Field (2009), the D-W statistics for this study are 2.152, which is slightly above 2, indicating that there is no serial autocorrelation issue.

Model Summary^b

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.662 ^a	.438	.422	1.26551	2.152

a. Predictors: (Constant), ATM, POS, MB

b. Dependent Variable: Deposit money bank performance

ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	132.335	3	44.112	27.544	.000 ^a
	Residual	169.760	106	1.602		
	Total	302.095	109			

a. Predictors: (Constant), TINTERTB, TPOS, TATM

b. Dependent Variable: Deposit money bank performance

Model Summary^b

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.662 ^a	.438	.422	1.26551	2.152

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	8.894	1.678		5.301	.000		
	POS	.557	.106	.344	2.540	.000	.803	1.245
	ATM	.535	.132	.344	4.057	.000	.737	1.357
	MB	.801	.152	.422	5.263	.000	.823	1.214

The regression results indicate that that financial technology accounts for 43.8 % of the variation in the deposit money banks performance in Katsina metropolis. The result is statistically significant, given the F statistics of 27.544 and p-value of 0.000, implying a strong positive influence of FinTech on bank performance. Further analysis from the coefficients indicates that ATM, POS, and Mobile Banking each have significant positive effects on DMB performance, with respective t-values of 4.057, 2.540 and 5.263 and p-value < .001. thee findings ead to rejection of the null hypothesis, supporting the conclusion that all three FinTech tools positively impact bank performance. The result align with Ologunwa et. al. (2024) and Okoro et al. (2024) regarding ATM, POS, although Okoro's findings differ on mobile banking, which was reported as having a negative impact. The studyis also consistent with Nwankwo and Okoli (2023) on the positive roe of mobile banking but diverges in relation to their findings on ATM and POS.

Conclusion and Recommendations

In this study, we examine the impact of FinTech and the performance of DMBs. The findings revealed a significant positive relationship between the performance of DMBs and the use of ATMs, POS and MB, suggesting that ATMs, POS and IB are crucial drivers of bank performance. Based on the findings, the study recommends

- i. **Modernizing Automated Teller Machine & Mobile Banking:** DMBs should invest in next generation technology and robust mobile banking platforms to enhance service reliability, security and user experience. This involves introducing biometric authentication, real-time transaction alert, 24/7 uptime assurance and user friendly mobile interfaces to meet evolving customer expectation. This can be achieved through upgrading ATM infrastructure to support

advanced functionalities such as cardless withdrawals, facial recognition, multilingual voice support and AI driven personalization.

- ii. **Build digital trust and literacy through financial inclusion initiatives:** DMBs should initiate digital literacy programs and consumer protection awareness campaigns to educate customers especially in underserved areas to use Mobile banking and POS confidently. Nonetheless, DMBs should focus on cyber security education, privacy protection and fraud prevention, building long-term relationship on trust in digital channels.
- iii. **Integrate Digital Channels into a Unified Customer Experience:** incorporating ATM, POS, and MB into single platform supported by real-time data analytics and cloud computing. This allows consistent user experience across channels, while enabling personalized services, proactive fraud detection and seamless cross-platform transactions.
- iv. **Open Banking and APIs for Strategic Partners:** DMBs should adopt open banking standards and integrate with fintechs via secure APIs to expand service offering. This enables third-party innovation (e.g., budgeting apps, micro-loans), while banks retain customer relationships and regulatory oversight.

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