

Effect of Digital Banking on Financial Performance of Listed Deposit Money Banks in Nigeria

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Abstract

This study investigated the impact of the digital banking on the financial performance of Deposit Money Banks (DMBs) in Nigeria, focusing on the role of key electronic banking platforms, namely Automated Teller Machines (ATMs), Point of Sale (POS) systems and Mobile Banking. Using an ex-post facto research design, the study examines time series data from 2014 to 2024, drawn from reputable sources such as the Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS). A multiple regression model is employed. The findings indicate that all three electronic banking platforms have a positive and statistically significant impact on the financial performance of Nigerian banks. The study's recommends that Banks should continue to invest in and expand their ATM networks and online banking to improve customer accessibility to banking services, particularly in underserved areas. The operational efficiency and customer convenience provided by ATMs, online banking and POS contribute to both customer satisfaction and increased profitability. Banks should also focus on upgrading their ATM infrastructure to include advanced features like mobile money integration and better security measures to mitigate potential fraud risks.

Keywords: Digital Banking, Financial Performance, Automated Teller Machines (ATMs), Point of Sale (POS) Systems and Mobile Banking.

INTRODUCTION

Application of technological advancement got across all sphere of human endeavours, spanning from science, applied science, medicine, law, religion and all other humanity. Technological advancement makes work easier, more accurate, effective and efficient; globally, technology is replacing human exertions. In advanced economy, technology is cheaper and affordable to procure and it work faster, perfectly and more reliable.

Digital banking is one of the most needful innovations in banking industry. Each bank eagerly desire to acquire the latest version to be

ahead and outrun it competitors and also maximize wealth of investors. Digital banking increased customer's satisfaction, draw banking services closer to the local people and remote areas. Digital banking makes payment for goods and services seemingly; one can make payment, deposit and remittance, recharge airtime and transfers of fund at the comfort of their home, office and even on transit, without physically going to banking hall/ counter.

Digital banking expands bank services and thereby increases bank customers. It is on the premise of availability of digital banking that Federal Government of Nigeria through Central Bank of Nigeria, at year 2023 introduced

cashless policy which intends to encourage and compel large number of citizen to open account in the bank, with the undertone intentions to widen tax net thereby increased revenue for government. In digital banking, customers are provided an opportunity to open bank account and operate their bank accounts remotely. Digital banking encompasses the use of electronic channels, including internet and mobile devices, to provide customers access to their accounts without the need for physical visits to bank premises and this has improved the levels of convenience offered to customers while minimizing the costs of operation and expansion.

According to (Okafor, 2008; Abdullateef and Salawudeen, 2020), an ATM is a piece of electronic equipment that enables clients of financial institutions to check their account balances without the assistance of a teller or cashier, make credit card cash advances or withdrawals, and access their accounts via a secure communication method. The use of electronic payment systems by Nigerian banks and non-bank financial firms is growing.

Tijani (2013) notes in his contribution that payment systems are easily accessible and quantifiable in terms of transaction costs, hazards, and reliability. If all aspects of the electronic payment system's efficiency are improved, system failure and financial risks such as credit, liquidity, and systematic risk can be avoided, increasing the payment system's dependability. One of the contemporary ways to speed up transaction completion is through electronic payment systems. Customer satisfaction with the electronic payment system is critical to its success.

A key indicator of banks' long-term survival and profitability is their financial performance, claim Nizam et al. (2019). Many stakeholders use the results to evaluate the health and sustainability of banks, therefore evaluating their financial performance is essential. To draw clients and investors and satisfy regulatory agencies, banks must advertise their performance (Panida & Sunsern, 2012; Aminu and Salawudeen, 2019). To stay competitive and grow, banks must maintain strong financial performance.

According to Hannagan (2008), a number of methods are used to measure banks' financial performance. Profitability, liquidity, asset quality, and capital adequacy techniques are among the tactics. Banks, particularly smaller ones, need to draw clients and make money. Technological developments in the industry are among the more recent elements that have been found to have a major impact on banks' performance. Electronic banking has grown fast in the banking industry as a result of technological improvements.

Statement of the Problem

Substantial and sustainable financial Performance is imperative for survival and growth of any organization. High financial performance is the heart beat of multinational companies. Digital Banking is said to influence financial performance of Nigerian banking industry. The big question is, does this high financial performance descended and get to the investors, the Shareholders? Or high financial performance was aloof for an extravagance spending on Banks chiefs and managers flamboyance lifestyles? These are questions to answer.

Banking innovations such as Mobile Banking (MB), Automated Teller Machines (ATM), Point of Sale (POS), Agency Banking (AB) and Internet Banking/ Online Banking has inherent Challenges most especially in third world economy. The problems faced in this developing economy are poor network and network instability, high transaction cost charged by banks, poor and weak cyber security measures. On this study we will assess and examine those problems and recommend the possible ways to mitigate those challenges.

There are many studies on effect of digital banking on financial performance in Nigerian banking industry. Ehiedu, Victor Chukwunweike (2023) carried out a study on the effect of electronic payment system (EPS) on efficiency of Banks in Nigeria, He used linear regression analysis. The result was that there is no discernible effect of electronic payment system on efficiency of banking in Nigeria. Regarding the effect of financial breakthroughs on bank

performance, earlier research such as Fan et al. (2013), Batiz-Lazo and Woldesenbet (2016), and Akram and Singh (2009) has yielded contradictory and ambiguous findings. According to research by Franscesa and Claeys (2010) and Mahdi and Nofie (2011), financial innovations had the least effect on bank performance. While Sushanta (2006) and Ngumi Patrick 2013 and Fyrose Gaya (2022) concluded that financial innovation had significant contribution to bank performance. It is at this point of conflicting and mixed conclusions that created and necessitated the need to carry out a study from Nigerian context to establish the effect of Digital banking on financial performance on Listed Deposit Money Banks (DMBs) in Nigeria.

Conversely, Padachi (2008) noted that digital banking has enabled commercial banks to enhance their transactions; nevertheless, the study does not address the potential effects of digital banking on financial performance. Conversely, Olaiya and Adeleke (2019) found no connection between banks' success and digital banking channels. It is evident from the reviewed literature that the impact of digital banking on financial performance has not been adequately highlighted in the researches that have been evaluated thus far. Since some banks are still failing, several holes in electronic banking have not been closed despite the creative suggestions.

Brewer (2020) discovered that banks perform better when they implement innovations across their multiple branches when researching the performance of small banks in the US with reference to interstate branching. Given these findings and the various gaps in the literature, further research of this kind is required in Africa, particularly in Nigeria, where bank innovations have increased over the last ten years.

Objectives of the Study

The major objective of this study is to examine the effect of digital banking on financial performance of Listed Deposit Money Banks (DMBs) in Nigeria. Others specific objective includes;

To examine and evaluate the extent in which Automated Teller Machine (ATM) affect financial performance of Listed Deposit Money Banks in Nigeria.

To assess the influence of Point of sale (POS) on financial performance of Listed Deposit Money Banks in Nigeria.

To examine and evaluate the effect of Mobile Banking (MB) on financial performance of Listed Deposit Money Banks in Nigeria.

Statement of Hypothesis

This Research hypothesis are formulated in their null forms to enable the study determine the effect of Digital banking on financial performance Of Listed Deposit Money Banks in Nigeria.

HO.1, Automated Teller Machines (ATMs) has no significant effect on financial performance of Listed Deposit Money Banks in Nigeria.

HO.2, Point of Sale (POS) has no discernible effect on financial performance of Listed Deposit Money Banks in Nigeria.

HO.3, Mobile Banking (MB) has no significant effect on financial performance of Listed Deposit Money Banks in Nigeria.

LITERATURE REVIEW

Mobile Banking Business

Mobile Banking refers to application of Androids Phone, smart Phones and PDA to carry out financial transaction with banks platforms' it is otherwise called Telephone banking. Using a mobile device, like a smart phone or PDA, to conduct financial transactions is known as mobile banking (Boston Consulting Group, 2009). According to Atanassov, Nanda, and Seru (2007), mobile banking is a system that enables people to conduct financial operations online.

Mobile banking is widely used in all Nigerian Deposit money bank; Nigeria has automated banking app. "Mobile banking is an innovation that has progressively rendered itself in pervasive ways cutting across several financial institutions and other sectors of the economy" and anybody with a mobile number can use it as

a bank account number. This service makes use of an automated phone answering system that transmits instructions to the distant computer via voice or short messaging service (SMS). The consumer receives the response when the computer decrypts the message and follows the instructions via a highly coded device. Both push messages where banks decide to send information to a client's mobile phone without the customer requesting it and pull messages where the customer makes the request are used to operate SMS services. For the purpose of this study, we will restrict transactions that went through Banks Mobile App (through telephones). Even though Nigerian banks provide this service, the banking public has not yet adopted it and it is not being utilized to its full potential.

Mobile Banking is one of the latest ways of making payments through mobile phones. This involves sending a payment request through a text message (USSD) or the bank's mobile application. Mobile banking reduces the time and stress of using the credit card or cash as account details are already linked with the bank's software.

Internet Banking also called online banking is service that uses internet services to carry out transactions. Customers of a financial institution, such as a physical or virtual bank, credit union, or building society, can use internet banking to make financial transactions on a secure website run by the organization. Customers can complete a variety of banking transactions via internet banking. Internet banking systems, according to (Mahdi, 2010; Abdullateef and Salawudeen, 2020), allow users to access their accounts and general details about the bank's goods and services through the bank's website without requiring human intervention or the time-consuming process of sending letters, faxes, original signatures, or phone confirmations. Instead of physically visiting a banking facility, internet banking involves using electronic tools and instruments to perform banking operations, including financial transfers, payments for goods and services, account queries, statement printing, and more. This kind of electronic banking usually takes place on the bank's website.

Additionally, it is typically more secure and reliable and offers about the same features as the mobile banking app with a few extras (Deekor, 2021; Salawudeen and Suleiman, 2025).

Internet banking in Nigeria has seen a significant growth over the past few years. Factors contributing to its rapid expansion in Nigeria includes increased in internet penetration, uses and availability of smart phones and more technological population. Central bank of Nigeria regulates internet banking to ensure sanctity, security stability. Banks are requires to implement robust security measures including multi-factor authentication and encryption to protect customers information and transactions.

In Nigerian banking industry the following four internet companies boosted internet banking and these are Fintech, Paystack, Flutterwave and Interswitch. They provide innovation solution that complement traditional banking services. Nigerian government implemented policies to promote financial inclusion and digital banking such as National Financial Inclusion Strategy and various digital economy Initiatives.

The following Nigerian banks in the forefront of Internet Banking are Guarantee Trust Bank (GTB), Zenith Bank and First Bank, they are said to offer user friendly platform and mobile app to facilitate online transaction. Customers must register with the institution for the service and create a password (under several names) for customer verification before they can utilize the online banking facility. Although some banks do see considerable usage of this service, staff reports indicate that overall usage of this service is somewhere in the low to medium range. Value cards, Verve cards, Naira credit cards, Visa cards, Master cards, and other smart cards for electronic banking.

In recent times, Nigerian banks have developed several services based on the use of computers and other electronic based information technology. All these electronic based services are simply referred to as e-banking, which means electronic banking. In 2022 December Central Bank of Nigeria redesigned currency and attempted to enforce cashless policy which

required electronic banking. The Basics committee on Banking Supervision defined electronic banking otherwise known as e-banking as “the provision of bank products and services through electronic channels, (Basics Committee 2003).” Internet banking and the use of personal computers in banking are major forms of electronic banking; it increases various interest groups satisfaction and confidence. Aboh (2003:29)

On this work, effect of Digital Banking on financial performance in Nigerian banking Industry, Mobile Banking is one of the independent variables; we will test and determine the influence of Mobile Banking / online banking on financial performance in Nigerian Banking Industry.

Automated Teller Machine (ATM)

Automated Teller machine (ATM); this is the technology of modern banking. This device, which is a precursor to mobile banking, takes bank cards with magnetic stripes as inputs, calculates balances, and makes payments. Airports, hotels, seaports, hospitals, and other open yet secure locations have it installed. Also referred to as a cash point or cash machine, it is computerized telecommunications equipment that enables financial transactions for a financial institution's customers without the need for a bank teller, cashier, or human clerk (DeYoung, 2005; Salawudeen and Dandago, 2020).

Automated Teller Machines (ATM) is an electronic banking outlet that allows customers to complete transactions without the assistance of a member service representative or teller. Anyone with a credit card or debit card can access an ATM as long as they are all on the same network. An ATM communicates through the ATM network so members can access their account information. (Acha et al., 2017).

Rose (1999) defined an automated teller machine (ATM) as a computer terminal that integrates a recordkeeping system and cash vault. By entering a unique code number into the computer terminal or by using a card with a personal identification number (PIN), users can access the bank's bookkeeping system around-

the-clock. All of a customer's personal information, including name, account number, card limit, and bank of concern, is contained on an ATM card, which is a piece of plastic with a magnetic strip. This electronic gadget functions as a cash dispenser and offers additional banking services, when a cardholder inserts an authorized credit or debit card from a bank with which they are currently a customer. Furthermore, it enables customers of financial institutions or intermediaries to conduct essential financial operations whenever they choose and without having to speak with bank staff directly, such as cash withdrawals, fund transfers, or account information retrievals. A Personal Information Number (PIN), which provides the account holder with the required access, is entered once the account holder inserts an electronic card into the machine (Deekor, 2021).

Point of Sale (POS) Terminal

A point of sale (POS) terminal is a type of retail payment system that, when a credit card or bank card is swiped (passed through a magnetic stripe scanner), reads the customer's bank name and account number. It makes contact with the bank, transfers or withdraws the customer-approved amount, and prints a receipt (if funds are available) (Business Dictionary, 2018). Point of Sale (POS) Terminals; these terminals allow customers to pay using payment cards issued by any bank in or outside of Nigeria, such as Visa, MasterCard, Verve, etc., directly into other accounts (Acha et al., 2017).

Point of Sales (POS) Terminals are widely used in Nigeria to facilitate electronic payment especially given the country's drive toward a cashless economy, adoption and usage of POS are commonly applied by businesses of all sizes, including retail stores, Restaurants, and services providers to accept debit and credit cards payment. CBN has been promoting the use of POS terminal as part of its cashless policy, aiming to reduce the reliance on cash transaction; major banks that pioneer POS in Nigerian economy are First Bank, Zenith Bank, GTB and Access Bank. The following advantages of POS are sales tracking, efficiency on aspect of Speed up check out process and improved overall business and also convenient

by reducing handling of cash and can be used in out sketch and remote areas.

An electronic terminal or device known as a point of sale (POS) is commonly used at retail establishments, including supermarkets, restaurants, petrol stations, and others, to process card payments using a PIN. It transfers funds from customers' accounts to the vendor's account, often known as the merchant, keeps track of every transaction, and prints the necessary receipt. The system gathers the required information from a customer's credit or debit cards, confirms that the accounts have sufficient funds, debits the account and sends the money to the merchant if the account is funded, records every completed transaction, prints the required receipt, or rejects the transaction because of insufficient funds.

The point-of-sale method is now widely used, especially in areas without banks or ATMs. They bridge the gap created by cash payments by trading cash for sums deducted from the premium on the customer's card. Mobile bank agents provide easily accessible cash for customers with credit or debit cards. However, there is a great deal of risk, especially in light of the increase in fraud and kidnapping. There is a risk that if a card is used on a terminal after being stolen or obtained under duress, the merchant will be held accountable because the transaction will be linked to that particular terminal. Along with stamp duty, CBN recently added a N50 fee to each POS transaction. Due to these, POS usage decreased and many terminals became inactive (Deekor,2021; Salawudeen and Shuaibu, 2025).

This Research work, effect of Digital Banking on financial performance in Nigerian banking Industry, Point of Sales (POS) terminal is one of the independent variables, we will examine, test and determine the influence of POS on financial performance in Nigerian Banking Industry.

Empirical Review

Chiejina Ofure Josephine (2021) investigates how Nigerian banks' performance is affected by the e-payment system. The study's specific goals are to study how Nigeria's economic growth is affected by e-payments systems, how mobile payments affect Nigerian banks' efficiency, how

important automated teller machines are to Nigerian banks' efficiency, and how point-of-sale (POS) systems affect Nigerian banks' efficiency. Collecting statistics on electronic payments from the Central Bank of Nigeria between 2012 and 2016. To determine the P-Value significance, which is provided at a significance level of 0.05, a linear regression analysis was used for this study, and SPSS was used to conduct the analysis. The analysis's P-Value significance of 0.333 indicates that the e-payment system has no discernible impact on Nigerian banks' operational efficiency.

Kinyua (2022) investigates the connection between Kenyan listed commercial banks' financial performance and digital banking. Both cross-sectional and longitudinal research designs were used in the study. The eleven Kenyan commercial banks that were identified made up the target demographic. The information was taken from publications and yearly financial reports between 2019 and 2022 and entered into secondary data capture forms. Descriptive statistics were used in the study to conduct regression and correlation analysis. Excel spreadsheets were used to evaluate the data. The study found that while ATM banking has a negative effect on the financial performance of Kenyan listed commercial banks, internet, agency, and mobile banking have a positive relationship with financial success.

Olaiya and Adeleke (2019) looked on the relationship between digital banking and Nigerian deposit money banks' profitability. Over an eight-year period beginning in 2010, secondary data was collected from Nigeria's central bank's statistical bulletins and financial stability reports. Unit root characteristics were first evaluated using stationary tests, and then inferential statistics were applied. Autoregressive lags were used to estimate the counteraction and ascertain the correlations between the variables.

Four variables made up the study's model: automated teller machine transaction values, internet banking, point of sale, and mobile banking. In independent tests, the transaction values of digital banking and internet banking demonstrated a negative relationship with return on assets, whereas the transaction values of

automated teller machines and point of sale demonstrated a positive correlation with return on assets when each variable was examined separately. Nevertheless, no meaningful correlation with return on assets was discovered when all four variables were considered collectively. Consequently, the study's concluded that digital banking and achievement of banks are not related.

Research was conducted by Zeleke and Chauhan (2022) to find out how electronic banking services impact the administration of Hawassa City, Ethiopia, in terms of meeting or exceeding consumer expectations. Of the 42,269 users of electronic banking across 23 branches, 400 were surveyed. Likert-type scale questionnaires were used to collect raw data, and 343 of the 400 participants answered. For data analysis, the study used ANOVA, regression, and correlation. Convenience, certainty, responsiveness, dependability, and tangibility were among the variables taken into account in the study. The results indicated that all variables, except for tangibility, had a positive influence on meeting consumer needs. The analysis ranked the order of importance of the quality of service measures as assurance, reactivity, reliability and lastly, convenience. The study concluded that measurements of service quality significantly impact the ability to meet and even surpass customer expectations.

The impact of electronic banking services on Kenyan commercial bank's' financial performance was investigated by Odhiambo and Ngaba (2019). The entire population, including all 43 Kenyan commercial banks, was the subject of the study, which included the analysis of both primary and secondary data. 24 managers in charge of the operations and electronic banking departments at these banks' headquarters made up the unit of observation. SPSS was used for data analysis, which included both descriptive and inferential statistics.

The research revealed a noteworthy positive correlation between electronic banking channels and the economic performance of commercial institutions.

Wadesango and Magaya (2020) examined how digital banking services affected Zimbabwe's commercial banks' performance, concentrating on CBZ. This one bank served as the study's population, and 25 respondents including top management and employees—were given questionnaires. Fifteen respondents were chosen at random to participate from this population. The data analysis utilized correlation and regression techniques. He found that online banking and the return on assets (ROA) are directly related. He concluded that increase in online customer deposits increased ROA. Additionally, internet banking expenses and online bank transactions contributed to an increase in the total assets' ratio.

In Ogun and Lagos states, Nigeria, Okoye et al. (2017) looked into how technology affected meeting customer expectations. The study concentrated on measures of customer satisfaction, such as convenience, dependability, decreased crime and danger, ease of use, and time savings. Oral interviews and questionnaires based on convenience and personal judgment were used to gather primary data from three banks. To gather data on the caliber of services users obtained on internet platforms, they employed 120 questionnaires. Data analysis was performed using SPSS, and model estimation was facilitated through ANOVA. The research revealed that electronic banking has a significant effect on customer contentment.

Akram and Allam (2010) determine the influence of technology on the Jordanian banks for the period 1999-2009. The amount of money invested in information technology to improve the matrix of financial and operational performances was measured by the study utilizing a pooled data regression using pooled least squares. According to the results of tests of hypothesis, the use of Management Information Systems [MIS] in Jordanian banks has an effect on market value added (MVA), earnings per share (EPS), and return on equity [ROE]. However, the use of MIS in Jordanian banks had no effect on these metrics. They concluded that due to the increased costs of investment in information technology which might work to reduce the return on the property.

Theoretical Framework

Technology Acceptance Model (TAM)

Technology Acceptance Model was propounded by Fred Davies in 1989. He introduced this model in his doctoral dissertation titled “Perceived Usefulness, Perceived ease of Use and User Acceptance information Technology” at the Massachusetts Institute of Technology (MIT). This model explains how users come to accept and use a Technology. It suggests that perceived ease of use and perceived usefulness are the primary factors influencing users’ decision to adopt new technologies including digital platforms. Theories and models used in studies related to the innovations, acceptance and use of new technology. The Technology Acceptance Model (TAM) is advanced by Davis (1989). This approach links a person's ICT use to their behavioral aims. It is said that a person's behavioral intention to use, which is impacted by their attitude toward and perception of the use of the technology, determines their actual behavior. However, simplicity of use determines both attitude and perceived utility. Understanding end users' needs in terms of usability and friendliness is necessary in order to implement the TAM model (Pedersen, Leif, Methlie, and Thorbjornsen, 2002).

According to this paradigm, consumers' opinions about any service are influenced by its utility and user-friendliness. According to Davis (1993), it is crucial to evaluate user requirements using the technology's perceived usefulness and user-friendliness rather than other objective metrics. This model is criticized for its focus on the technical features of the technology in

METHODOLOGY

Research Design

The study adopted ex-post facto research design. An ex-post facto research design, also known as a retrospective or causal-comparative design, is characterized by the investigation of the possible

question, neglecting other aspects like the users' social lives. In actuality, the freedom to act will be restricted by limitations including time, limited capacity, organizational or environmental restrictions, and unconscious tendencies; Wang, Lin and Tang (2003) were interested to identify the factors that determine acceptance of internet banking by the users.

Network Externalities Theory

The concept of Network Externalities was introduced and discussed by Jeffrey Rolf in 1974 in his paper titled “A Theory of Interdependent Demand for communication service”. However, the term Network Externalities itself became widely used and further developed in the 1980s especially in the context of technology and telecommunication industry.

The theory suggests that the value of a product or service increases as more people use it. In digital banking, the more users there are on a platform, the more valuable the platform becomes, leading to more features and better security. Application in digital banking is as more users adopt digital banking, it becomes more advantageous for others to join, creating a positive feedback loop of growth and development ChatGPT 2024. This theory is criticized on the context of unreliable security and cyber security threat that are prevalent as more people come to a particular platform, the more risky the platform becomes.

Network Externalities Theory is imperative in determining the effect of Digital Banking on financial performance in Nigerian banking Industry

cause-and-effect relationship between an independent variable and a dependent variable.

Population, Sample and Sampling Technique

The populations of the study comprise 15 DMBs listed on the Nigerian Exchange Group (NGX) as of 31st December 2024

Table 1 Population of the study

S/N	
1	ACCESS BANK PLC
2	FIDELITY BANK PLC
3	FIRST CITY MONUMENT BANK PLC
4	FIRST BANK NIGERIA LIMITED
5	GUARANTY TRUST BANK PLC
6	UNION BANK OF NIGERIA PLC
7	UNITED BANK OF AFRICA PLC
8	ZENITH BANK PLC
9	ECOBANK NIGERIA PLC
10	STANBIC IBTC BANK PLC
11	STANDARD CHARTERED BANK
12	STERLING BANK PLC
13	UNITY BANK PLC
14	WEMA BANK PLC
15	JAIZ BANK PLC

Source: Researcher's compilation 2024. All these Deposit Money Banks in Nigeria are used. The choice of all the Deposit Money Banks is informed by the need of the researcher to cover all the elements of the population such that possible generalization can easily be made. The banks share marked similarities in terms of their nature of work and environment of operations. They render financial services to customers and investors who need quality financial reports in order to make informed economic decisions.

Methods of Data Collection

This study utilizes secondary data for analysis, focusing on monthly time series data covering the period from 2014 to 2024. The data sources include reputable organizations such as the Central Bank of Nigeria (CBN), the World Bank, and the National Bureau of Statistics (NBS). These sources provide comprehensive, reliable, and consistent data that are essential for examining the impact of Digital Banking on financial performance of Deposit Money Banks (DMBs) in Nigeria.

Technique for Data Analysis and Model Specification

The study utilized a regression model to explore the relationship between the independent variables and the performance of commercial banks. Regression analysis is a statistical

technique that examines the strength and character of the relationship between a dependent variable and one or more independent variables. The study opted for Ordinary Least Squares (OLS) regression analysis. OLS is a widely used method in econometrics to estimate the parameters of a linear regression model. It minimizes the sum of the squared differences between the observed and predicted values, providing a robust method for understanding the relationships between variables.

Model Specification

The model for the study is

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

Where:

ROE = Return on Equity

$\beta_1 \dots \beta_5$ = Slope Coefficient

β_0 = Intercept

ATM = Automated Teller Machine

RESULT AND DISCUSSION

4.1.1 Descriptive Statistics

Table 2 Descriptive Statistics

	ROE	ATM	POS	MB
Mean	43.26033	246.9859	47.84375	10.46250
Median	29.57030	146.2500	5.140625	4.573435
Maximum	210.3690	918.8700	165.9660	31.13130
Minimum	8.668440	11.20000	0.162500	0.384375
Std. Dev.	39.75907	240.8779	66.07167	11.60874
Skewness	2.392438	0.865536	0.996471	0.925468
Kurtosis	8.593539	2.479447	2.178161	2.113811
Jarque-Bera	144.4873	8.713569	12.39262	11.23012
Probability	0.000000	0.012820	0.002037	0.003643
Sum	2768.661	15807.10	3062.000	669.6003

POS = Point of Sales

MB = Mobile Banking

Measurement of Variables

The independent variables model is measured as follows;

Automated Teller Machine (ATM): was measured by total value of ATM transactions by Commercial banks in Nigeria.

Point of Sales (POS): was measured by total value of (POS) transactions by Commercial banks in Nigeria.

Mobile Banking (MB): was measured by total value of mobile banking transactions by Commercial banks in Nigeria.

Return on Equity: reflects how effectively a bank management is using shareholders' funds. It was calculated as followed; Net income divided by shareholder funds

Sum Sq. Dev. 99589.35 3655396. 275024.3 8490.058

Source E-view 13

Table 2 reveals that deposit money banks in the study have an average performance of 43.26033 in terms of Return on Equity (ROE). This shows that the average rate of return on equity is 43%. with standard deviation of 39.75907, and minimum value of 8.668440 and 210.3690 as the maximum value. This statistic reveals that the level of deviation of the minimum from the maximum value is high.

Regarding the independent variables, automated teller machine (ATM) has a mean value 246.9859 with a standard deviation of 240.8779. the minimum and maximum are 11.20000 and 918.8700 respectively. The average Point of sale (POS) of deposit money banks as indicated by the mean from table 47.84375, The standard deviation is 66.07167. This indicates the average level of POS transactions across the deposit money banks. The difference between the mean and the standard deviation (0.162500) appears to be a calculation error, as the standard deviation is typically expressed as a single value and not as a difference from the mean. The minimum value of POS transactions is

0.162500, and the maximum is 165.9660. These values represent the range of POS transactions across the banks. The minimum value of 0.162500 indicates that at least one bank in the study has a very low level of POS transactions, possibly close to zero. The maximum value of 165.9660 suggests that there is another bank with a high level of POS transactions.

The mean value for Mobile Banking is 10.46250, indicating that, on average; deposit money banks have a mobile banking score of 10.4%. This score represents the average level of mobile banking adoption across the banks in the study. The standard deviation is 11.60874. A low standard deviation suggests that the individual mobile banking scores deviate less from the mean. In other words, there is relatively low variability in the adoption of mobile banking across the banks. The minimum value for Mobile Banking is 0.384375, and the maximum is 31.13130. These values represent the range of mobile banking transactions among the deposit money banks.

Table 3 Results of unit root test in first order difference

VARIABLE	ADF	P-value	Order of Integration
ROE	-6.959028	0.000	1
ATM	-3.468750	0.0128	1
POS	-4.063505	0.0022	1
MB	-4.535015	0.0005	1

Source E-view 13

The results presented in Table 3 indicate that the series variables, namely Return on Equity (ROE), Automated Teller Machines (ATM), Point of Sale (POS) and Mobile Banking (MB) exhibit integration of order one (I(1)). Additionally, these variables are stationary at first differences, as evidenced by their respective p-values, all of which are statistically significant at a 5% level.

In empirical analyses, especially with time series data, it is crucial to establish the presence or absence of a unit root. The unit root test is

essential because econometric studies have shown that regression analyses involving time series data with unit roots can yield spurious results. As noted by Townsend (2001), this step is fundamental for ensuring the reliability of subsequent statistical analyses.

The significance of unit root tests is underscored by the findings of Granger and New bold (1974), who observed that certain time series exhibit trends over time. Regressions conducted between such trended series may yield parameters that appear statistically significant

but are, in fact, spurious or lack meaningful economic interpretation.

Consequently, the results of the unit root tests conducted in this study reveal that the data used for the analysis are stationary. This implies that the variables under consideration do not exhibit

a unit root, and their integration of order one (1)) suggests that they are suitable for further time series analyses without the risk of spurious regression results. The confirmation of linearity at first differences enhances the credibility of subsequent statistical inferences drawn from the dataset.

Diagnostic Tests

The following robustness tests are carried out to find out whether data used for analysis performed for interpretation is reliable.

Table 4 Test for Heteroscedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

F-statistic	2.070711	Prob. F(2,61)	0.1349
Obs*R-squared	4.068855	Prob. Chi-Square(2)	0.1308
Scaled explained SS	13.00179	Prob. Chi-Square(2)	0.0015

Source E-view 13

This test is used to check the normality of residuals in the result. From the table however, the chi-square has a value of 2.070711 and a probability of 0.1349. This gives us prove that

there is absence of heteroscedasticity in the study, since it is not significant at 5%. Thus, the null hypothesis that states that the residuals have no constant variance and zero mean is rejected

Table 5 Multiple Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.865667	4.884905	0.791349	0.4319
D(ATM)	0.169564	0.00437	38.77323	0.0000
D(POS)	3.802094	0.281730	13.49550	0.0000
D(MB)	22.17594	1.569557	14.12879	0.0000
R-squared	0.517472	Mean dependent var		43.26033
Adjusted R-squared	0.493063	S.D. dependent var		39.75907
S.E. of regression	18.94039	Akaike info criterion		8.795374
Sum squared resid	21165.56	Schwarz criterion		8.964037
Log likelihood	-276.4520	Hannan-Quinn criter.		8.861819
F-statistic	54.65251	Durbin-Watson stat		0.999472
Prob(F-statistic)	0.000000			

Source E-view 13

The regression results in Table 4.3 provide valuable insights into the relationship between the dependent variable, Return on Equity (ROE), and the set of independent variables, namely Automated Teller Machines (ATM), Point of Sale (POS), and Mobile Banking (MB). Among the key metrics reported, the R-squared (R^2) stands out as a crucial indicator of the model's explanatory power. In this particular regression, the R^2 is approximately 0.517472, or 52%. This means that about 52% of the variability in the ROE of deposit money banks in Nigeria can be explained by changes in the specified independent variables (ATM, POS, and MB).

The overall results demonstrate the robustness of the model, as indicated by the substantial F-statistic value of 54.65251, which is statistically significant at the 1% level. This high F-statistic suggests that the model is well-fitted with the selected variables. In practical terms, it implies that the chosen independent variables Automated Teller Machines (ATM), Point of Sale (POS) and Mobile Banking (MB) are significant determinants of the financial performance of deposit money banks in Nigeria. The Durbin–Watson (DW) statistic, measuring the presence of autocorrelation in residuals, is reported as 0.999472. This value is close to 2, indicating that autocorrelation is not a significant concern that would compromise the validity of statistical inferences drawn from this study. In other words, the model's residuals exhibit minimal serial correlation, ensuring the reliability of the estimated coefficients and their associated statistical significance.

Hypothesis I

The ATM variable in the regression analysis exhibited a t-value of 2.16, with a corresponding coefficient of 0.169564, which is deemed significant at the 5% level. This implies that Automated Teller Machines (ATM) exert a positive and statistically significant influence on the Return on Equity (ROE) of deposit money banks in Nigeria.

The positive and statistically significant relationship between ATMs and ROE (coefficient of 0.169564) suggests that as banks deploy more ATMs, they experience higher financial performance. This finding aligns with the Bank Focused Theory, which emphasizes the use of non-traditional, low-cost delivery channels to enhance customer service. ATMs are a key component of branchless banking, providing customers with greater access to banking services without the need to visit a physical branch. This not only increases convenience for customers but also reduces operational costs for banks, contributing to improved profitability. The increased accessibility and cost-effectiveness of ATMs directly enhance customer satisfaction and loyalty, which can lead to higher returns on equity. By providing a cost-efficient and convenient service, banks can realize operational savings, which are reflected in improved financial performance.

In economic terms, the positive coefficient of 0.169564 indicates that, on average, a one-unit increase in the number of ATMs is associated with a 16.95% increase in the Return on Equity of deposit money banks. This finding holds important implications for the financial performance of these banks. The positive relationship suggests that as banks increase their deployment of ATMs, they are likely to experience improvements in financial performance. ATMs contribute to enhanced customer convenience, allowing for easier access to banking services, which may positively impact customer satisfaction and loyalty. The increase in ROE associated with ATM deployment may also reflect improved cost efficiency. ATMs provide a cost-effective means for routine transactions, reducing the need for manual interventions and associated operational costs. This efficiency can contribute to higher returns on equity. The study rejects the first null hypothesis formulated; which assumed that

ATM has no significant effect on the financial performance of deposit money banks in Nigeria.

Hypothesis II

The Point of Sale (POS) variable in the regression analysis demonstrated a positive and highly significant impact on Return on Equity (ROE) with a coefficient of 3.802094, a t-value of 13.49550, and a p-value of 0.0000. This signifies that, in the context of deposit money banks in Nigeria, POS has a substantial and statistically significant influence on the financial performance of these institutions. The positive coefficient of 3.802094 implies that, on average, a 1% increase in Point of Sale (POS) transactions is associated with a 3.8% increase in Return on Equity. This positive relationship suggests that the utilization and expansion of POS services contribute positively to the financial performance of deposit money banks. The positive impact of POS on ROE suggests that deposit money banks benefit from revenue diversification through electronic payment systems. As POS transactions increase, banks may earn fees and commissions, contributing to overall revenue and, subsequently ROE. The reliance on POS services is often associated with changing consumer behavior towards electronic and cashless transactions. Banks that actively engage in facilitating POS transactions are likely to attract and retain customers who prefer the convenience and efficiency of electronic payments. Thus, the study rejects the second null hypothesis formulated; which assumed that point of sales has no significant effect on the financial performance of deposit money banks in Nigeria.

Hypothesis III

The regression results reveal that the coefficient for Mobile Banking is positive and statistically significant in influencing Return on Equity (ROE). With a coefficient of 22.17594, a t-value of 2.927543, and a p-value of 0.0000, the findings suggest that Mobile Banking has a substantial and statistically significant impact on the financial performance of deposit money

banks in Nigeria. The positive coefficient of 22.17594 implies that, on average, a 1% change in Mobile Banking is associated with a 2.92% increase in Return on Equity. This indicates that the utilization and growth of Mobile Banking services contribute positively to the financial performance of deposit money banks. The high t-value of 2.927543 and the very low p-value of 0.0000 signify that the observed relationship between Mobile Banking and ROE is statistically significant at the 1% level. This robust statistical significance strengthens the credibility of the findings. The study provides compelling evidence to reject the null hypothesis, affirming that Mobile Banking has a significant and positive impact on the financial performance of deposit money banks in Nigeria. These findings underscore the importance of continued investment in and strategic focus on Mobile Banking services to stay competitive and meet the evolving needs of the modern banking customer.

Summary of Findings

The ATM variable in the regression analysis exhibited a t-value of 2.16, with a corresponding coefficient of 0.169564, which is deemed significant at the 5% level. This implies that Automated Teller Machines (ATM) exert a positive and statistically significant influence on the Return on Equity (ROE) of deposit money banks in Nigeria.

The Point of Sale (POS) variable in the regression analysis demonstrated a positive and highly significant impact on Return on Equity (ROE) with a coefficient of 3.802094, a t-value of 13.49550, and a p-value of 0.0000. This signifies that, in the context of deposit money banks in Nigeria, POS has a substantial and statistically significant influence on the financial performance of these institutions.

The regression results reveal that the coefficient for Mobile Banking is positive and statistically significant in influencing Return on Equity (ROE). With a coefficient of 22.17594, a t-value of 2.927543, and a p-value of 0.0000, the findings suggest that Mobile Banking has a substantial and statistically significant impact on

the financial performance of deposit money banks in Nigeria.

Conclusion

In conclusion, the findings of the study highlight the pivotal role of digital banking, specifically Automated Teller Machines (ATM), Point of Sale (POS) and Mobile Banking, in shaping the financial performance of deposit money banks in Nigeria. The study revealed that ATM has a positive significant effect on financial performance. The study implies that the adoption and utilization of ATMs contribute not only to operational efficiency but also to the overall financial health of banks. The study also revealed that POS has a positive significant effect on financial performance. The study underscores the importance of customer-centric innovation, with POS systems offering a convenient and efficient way for customers to conduct transactions. The positive effect on financial performance implies that banks investing in and promoting POS services align with customer preferences, resulting in increased satisfaction and loyalty. The study similarly revealed that mobile banking has a positive significant effect on financial performance. The study suggests that the positive relationship between Mobile Banking and financial performance is indicative of enhanced customer engagement. Mobile banking platforms provide customers with convenient, on-the-go access to a range of banking services, fostering increased interaction and satisfaction. Improved engagement can contribute to increased loyalty and positive customer experiences.

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Recommendations

Based on findings and conclusions, the following recommendations are made for deposit money Bank in Nigeria and Regulatory Bodies.

Banks should continue to invest in and expand their ATM networks to improve customer accessibility to banking services, particularly in underserved areas. The operational efficiency and customer convenience provided by ATMs contribute to both customer satisfaction and increased profitability. Banks should also focus on upgrading their ATM infrastructure to include advanced features like mobile money integration and better security measures to mitigate potential fraud risks.

The significant positive impact of POS systems on financial performance indicates the need for banks to further expand their POS network. Increasing the number of POS terminals, especially in remote areas, can enhance service delivery and boost transaction volumes. Banks should also focus on improving the reliability and ease of use of POS systems to encourage more customers to adopt electronic payments, which will lead to higher revenue from transaction fees and commissions.

Regulatory bodies especially Central Bank of Nigeria should ensure all POS are duly registered in such a way that it can be traced and tracked, even freeze it operation when need arise. CBN should put in place a strict monitoring Team on Banks and POS operator to reduce frauds etc.

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