



# Impact of Electronic Banking on the Performance of Deposit Money Banks in Nigeria

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**Abstract:** *This paper investigates the multifaceted impact of electronic banking on Deposit Money Banks (DMBs) in Nigeria. The study's hypotheses were formulated to ascertain the significance of electronic banking adoption on DMBs' financial performance. Rooted in the Technology Acceptance Model, the study employed a longitudinal approach, observing licensed commercial banks in Nigeria through a census method and utilizing secondary data analysis. The analytical model assessed the impact of ATM, POS, and mobile banking on bank performance, utilizing equations to evaluate Return on Equity (ROE) and Return on Assets (ROA). Findings revealed that various electronic banking methods significantly influence a bank's financial performance. Notably, POS transactions demonstrated the most substantial impact on ROE, while mobile banking exhibited the least. The study suggested strategies for banks to optimize performance, emphasizing reducing certain transaction volumes while enhancing others through different electronic banking channels. This study, thus, provides critical insights into electronic banking's intricate dynamics, offering valuable guidance for industry stakeholders and policymakers to optimize operations, enhance customer experiences, and drive sustainable growth in the digital banking landscape.*

**Keywords:** *Electronic, Banking, Deposit Money Banks, return on Equity and Return on Asset, Nigeria.*

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## 1.0 Introduction:

The effective management of accounts within the banking industry increasingly relies on the integration and application of information technology. Specifically, the utilization of internet banking has streamlined the monitoring of customers' financial situations, facilitated essential communication, and enabled the efficient management of joint bank accounts (Wisetsri et al., 2021). AlShraah (2022) highlights that the widespread availability of personal computers, broadband internet access, and the World Wide Web has established the internet as a primary platform for both order acceptance and service provision across diverse customer bases. This trend has grown significantly, with "Internet Banking" becoming a common term for conducting financial transactions (Worasuwannarak & Kankaew, 2022). Recognizing the critical importance of creative thinking for organizational success, it is acknowledged that electronic banking (e-banking) serves as a valuable supplementary service for consumers, whether local or international (Alabdullah, 2021). Antonopoulou (2022) asserts that banks offer a range of services, including Internet banking, mobile banking, ATM transactions, electronic stock trading, online bill payments, digital statements, e-visas, and more. They also integrate specific features into personal record-keeping systems, which is crucial for online banking. In some online savings contexts, customers can oversee all their deposits in one place, whether at a single bank or

multiple institutions. Managing these services online is considered more cost-effective than traditional banking methods. Gautam and Kumar (2019) highlighted how financial institutions in India have employed advanced computer networks to automate millions of daily transactions for many years. Their research supports Angelakopoulos and Mihiotis's (2019) findings, which emphasize Bank of America's pioneering role in the 1950s. This bank laid the foundation for using electronic computers to efficiently handle labor-intensive tasks like managing checks and balancing accounts, leading other institutions to gradually transition from paper-based checks to entirely electronic systems. This evolution included using data-processing machines, organizing documents with robots, and developing optical character recognition, which converts handwritten or typewritten words into machine-readable text (Angelakopoulos & Mihiotis, 2019). Over the past few decades, the Nigerian economy has traditionally relied heavily on cash transactions, especially in consumer dealings. However, there's been a notable shift, largely led by the Central Bank of Nigeria (CBN) and commercial banks, toward embracing innovative payment systems. This shift has propelled the payments landscape from its earlier stages to a highly digitized state, distinguishing Nigeria from many other developing economies. This shift is evident in the increased utilization of payment technologies within the country, as highlighted by Bingilar & Bariweni (2019). The evolution of Nigeria's banking industry began in 1986 following deregulation, which laid the groundwork for the emergence of electronic banking (Oluwatolani et al., 2011; Abubakar, 2014). However, the widespread adoption of electronic payment systems gained significant momentum in 2012, triggered by the Central Bank's introduction of two interlinked policies: the sustainable banking principles, focusing on societal development and environmental well-being, and the cashless policy, launched in July 2013 to reduce reliance on cash transactions and combat illicit activities (Gbanador, 2018). To meet the objectives of these CBN policies, banks intensified their efforts in implementing e-banking products like point-of-sale systems, internet banking, telebanking, mobile banking, automated teller machines, NIBSS instant payment (NIP), NIBSS electronic fund transfer (NEFT), and other technologies.

## **2.0 Methodology**

The study employed a longitudinal approach, observing licensed commercial banks in Nigeria. It utilized a census method to encompass the entire population and relied on secondary data collected through a specific data sheet. Both descriptive and inferential statistical analyses were conducted, including calculations of mean, median, minimum, maximum, and standard deviation to identify trends. Stata Software version 12 was used to generate charts and trend reports, while diagnostic tests were conducted to evaluate the validity of the model based on Fixed Effect Regression Model assumptions. The findings were presented through tables and figures for clarity. The analytical model used to assess the impact of electronic banking on the performance of Deposit Money Banks in Nigeria is outlined below:

$$Y_{it} = \beta_0 + \alpha X_{ijt} + \beta Z_t + \epsilon_{it} \dots\dots\dots \text{General Equation 1}$$

Where;

The equation used to analyze how ATM, POS, and Mobile banking affect the performance of commercial banks in Nigeria is represented by the formula: Y = Performance of Commercial Banks (Dependent Variable), where Y stands for variables like ROE, i represents Commercial Bank, t

denotes the year,  $\beta_0$  signifies the x-intercept, X signifies the independent variables,  $\beta_0$  stands for the Constant,  $\alpha$  and  $\beta$  are coefficients, while  $\epsilon_{it}$  represents the error term. Z represents Other Determinants of bank performance.

$$ROE_{it} = \beta_0 + \beta_1 MBit + \beta_2 POS_{it} + \beta_3 ATM_{it} + \epsilon_{it} \dots\dots\dots \text{Equation 2}$$

$$ROA_{it} = \beta_0 + \beta_1 MBit + \beta_2 POS_{it} + \beta_3 ATM_{it} + \epsilon_{it} \dots\dots\dots \text{Equation 3}$$

Where;

ROE<sub>it</sub> represents the Return on Equity of bank i during year t.

ROA<sub>it</sub> signifies the Return on Assets of bank i during year t.

MBit stands for the value of mobile banking transactions.

POS<sub>it</sub> measures the count of POS terminals for point of sale transactions.

ATM<sub>it</sub> quantifies the value of transactions conducted through automatic teller machines (ATMs).

### 3.0 Result and Discussions

#### 3.1 Data Analysis, Results and Findings

The data collected consisted of numerical values spanning a range of scales, from percentages to figures in the billions. Among these, the dependent variables with the smallest scales were ROA and ROE, while those with the largest scales were value-based dependent variables. Upon closer inspection of the standard deviation in relation to the mean, only three variables exhibited standard deviations ranging from 31% to 40% of the mean. These specific variables encompass Prepaid Cards on ATMs/Total Transaction Volumes, Total Value Transacted on POS Machines/Total Transaction Value, and Cards on POS Machines/Total Transaction Volumes. The distribution of variables across different standard deviation groupings can be found in table 1

Std. Deviation Groupings	Count
0-15%	3
16%-25%	3
26%-35%	3
36%-45%	4
46%-55%	2
>55%	2

The typical deviation ranges from 16% to 25% of the mean for most variables, with around 30% for the median. This indicates that many variables exhibit consistent patterns over time, yet over half of them show variations greater than 25%.

**Regression Results of Fixed Effect Model**

The outcomes of the regression analysis using the fixed effect model displayed the impact of three independent variables on the performance of Nigerian commercial banks. This model aimed to assess the statistical importance of mobile banking, Point of Sale (POS), and Automated Teller Machines (ATM) on the banks' performance. The statistics describing Return on Assets (ROA) showed relatively steady trends, whereas Return on Equity (ROE) varied throughout the chosen timeframe. Therefore, ROE was chosen for the analysis due to its fluctuations.

$$ROE_{it} = \beta_0 + \beta_1MB_{it} + \beta_2POS_{it} + \beta_3ATM_{it} + \epsilon_{it} \dots\dots\dots\text{Equation}$$

<b>Table 2: Effect of Mobile Banking, POS and ATM on Return on Equity</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Mobile Banking	47.02671	7.30027	6.83	0.0000
POS	20672.47	3623.107	5.58	0.0000
ATM	517861.79	6073.55	7.41	0.0000
ROE	-6088.			
Constant C	60701.03	5073.639	4.671	
Effect Specification				
Period Fixed				
R-Squared	0.65521	Mean dependent var		0.415621
Adjusted R-squared	0.471834	S.D. Dependent var		0.273002
S.E. of regression	0.008540	Akaike info criterion		-0.577242
Sum squared resid	7.178134	Schwarz Creterion		-0.32226
Log likelihood	23.4326	Hannan-Quinn Criter		-0.488218
F-statistic	6.85013	Durbin-Watson Stat		1.775023
Prob(F-statistic)	0.00128			

The data in the table demonstrates that the fixed model's r-squared and adjusted R-squared values stand at 65.52% and 47.18% respectively. The adjusted R-squared signifies a 47% variance in return on equity based on alterations in the three dependent variables. Hence, it suggests that collectively, Mobile Banking, POS, and ATM play a role in influencing the performance of commercial banks in Nigeria. The panel regression outcome revealed that a shift of one unit in mobile banking volume leads to a 47.026-unit upturn in financial performance. Additionally, in the multiple regression model, a 1% increase in total agent cash in cash-out value relative to Total Transaction Value corresponds to a 0.504% decline in ROE. However, this variable lacks significant influence on ROE as its p-value surpasses 0.05. Nevertheless, this discovery indicates that a rise in cash in cash-out value as part of Total Transaction Value could negatively impact banks' performance.

Researchers evaluated how point-of-sale banking impacted financial performance by analyzing the ratio of cards used on POS machines to the Total Transaction Value. The results indicated that a 1% rise in the total value transacted on POS Machines as part of the Total Transaction Value would cause a mere 0.801% increase in ROE. However, this increase wasn't statistically significant in explaining ROE, as its p-value exceeded 0.05. Despite this, it suggests that banks could see some

positive benefit in their ROE from boosting POS banking activities. The study looked into how ATM transactions impact financial performance by comparing the total value transacted on ATMs against the overall transaction value. This measure had a positive influence on ROE, suggesting that boosting this factor would likely increase ROE. However, it didn't play a significant role in explaining ROE because its p-value exceeded 0.05. This suggests that despite the positive correlation, transacting more on ATMs might have actually decreased ROE. Therefore, banks could enhance their performance by either restricting or discouraging the value of transactions conducted on ATMs.

#### **4.0 Conclusion and Recommendation**

The research findings suggest that various banking methods such as Mobile Banking, Point of Sale Banking, and Automated Teller Machines (ATM) impact a bank's financial performance. Among these methods, the Total Value Transacted on Point of Sale (POS) Machines, compared to total transactions, has the most substantial influence on financial performance. Conversely, Mobile Banking shows the lowest impact. For instance, a 1% increase in POS machine transaction value elevates Return on Equity (ROE) by a minimum of 40.01%. On the contrary, a 1% rise in Cash in Cash out value through agents reduces ROE by 40.12%

#### **4.1 Recommendation**

1. The study suggests that banks can mitigate poor performance by reducing the volume of transactions via mobile banking agents and ATMs.
2. Conversely, they can enhance performance by fostering higher transaction values through POS Machines.
3. The research also notes that while the regression model effectively explains how independent variables affect a bank's financial performance, these variables only partially clarify financial performance.

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