



EFFECT OF ELECTRONIC BANKING SYSTEMS ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN NIGERIA.

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ABSTRACT

This research sets out to examine the relationship between electronic banking and the performance of deposit money banks (DMBs) in Nigeria using ex-post facto research design while adopting, the cointegration error correction model approach. Quarterly time series data of Mobile banking (MB), real-time gross settlement (RTGS), NIBSS Instant Payment (NIP), and Return on Assets (ROA) were obtained from the Central Bank of Nigeria Statistical bulletin during the period 2010Q1-2024Q1. Data obtained were analyzed using both descriptive (mean, standard deviation, and Pearson correlation) and inferential (unit roots, co-integration, error correction model, Jacque-Bera test, and variance inflation factor test) statistical techniques. Findings revealed that electronic banking systems have been found to have a considerable impact on the financial performance of commercial banks in Nigeria. This conclusion has been drawn from the evaluation of these systems. This is because electronic banking automates a lot of processes, which lowers bank operating expenses.

Keywords: E-Banking, Financial Performance, Real-Time Gross Settlement (RTGS), Nigeria Inter-Bank Settlement System (NIBSS), Instant Payment (NIP), Mobile banking

JEL: C53, E41, F10, G21, G28, I10

INTRODUCTION

It is impossible to ignore how much technology advancements have affected organizations, especially those in the finance sector. According to Mutolu and Nwadiolor (2019), the financial system is a vital component of every economy since it facilitates the transfer of financial resources between different economic segments. By creating and implementing new products in step with technical advancements known as "electronic banking," deposit money banks (DMBs) have worked to improve their performance on a global scale. Digital banking includes, among other things, online and mobile phone banking as well as automated teller machines (ATMs). So, commercial banks have consistently used the tactic of automating their processes as a means of achieving better financial performance in a fiercely competitive market like the Nigerian banking sector. Given the competition among banks for a sizable portion of the market and a diverse asset base, cost and operational efficiency are major concerns for banks, and commercial banks in particular.

The aforementioned conflict frequently arises from the intense rivalry between banks, particularly during a period such as this one when banks are facing low deposit levels due to low interest rates on deposits. Research has indicated that focusing solely on customer satisfaction is insufficient to



maintain operational effectiveness and ensure financial success, as profit is ultimately what matters most. Thus, the necessity for e-banking which offers the benefit of cost savings. However, e-banking comes with drawbacks as well, such as power outages, inconsistent service, internet access, and security issues brought on by hackers' actions.

The main objective of this study is to determine the effect of electronic banking systems on the financial performance of commercial banks in Nigeria. The specific objectives of the study include;

1. To determine the effect of Mobile banking on the financial performance of commercial banks in Nigeria,
2. To ascertain the effect of Real-Time Gross Settlement (RTGS) on the financial performance of commercial banks in Nigeria, and
3. To examine the effect of NIBSS Instant Payment (NIP) on the financial performance of commercial banks in Nigeria.

The following research questions will guide this study.

1. What effect does Mobile banking have on the financial performance of commercial banks in Nigeria?
2. What effect does Real-Time Gross Settlement (RTGS) have on the financial performance of commercial banks in Nigeria?
3. How does NIBSS Instant Payment (NIP) affect the financial performance of commercial banks in Nigeria?

The research hypotheses for this study are stated in a null form.

1. H₀₁: Mobile banking has no significant effect on the financial performance of commercial banks in Nigeria
2. H₀₂: Real-Time Gross Settlement (RTGS) has no significant effect on the financial performance of commercial banks in Nigeria
3. H₀₃: NIBSS Instant Payment (NIP) has no significant effect on the financial performance of commercial banks in Nigeria.

LITERATURE REVIEW

Theoretical framework

The theories upon which this study would be anchored are the Bank focus theory by Kapoor (2010) and the Technology acceptance model as proposed by Fred Davis in 1989.

Bank-Focused Theory

Kapoor (2010) made this notion more widely known. The fundamental idea behind it was that banks provide their clients with services through conventional low-cost delivery channels in addition to non-traditional ones. NIBS NIP, mobile phone banking, and automated teller machines (ATMs) are a few examples of these channels. The bank provides a wide range of services to its clients through these channels, irrespective of their location or branch affiliations. The transaction can be completed by simply entering the necessary data into the system. This study's underlying hypothesis is that electronic platforms are a more effective way to deliver services.



Technology Acceptance Model (TAM)

In 1989, Fred Davis of the Massachusetts Institute of Technology submitted his doctoral thesis, which elaborated on how users provide their consent and utilize technology. This paradigm, often known as the Technology Acceptance paradigm (TAM), was created to illustrate how people adopt and utilize technology. This model's theoretical foundation is based on the idea that when consumers are introduced to new technology, three key aspects affect their choice of when and how to use it. User attitude toward usage (ATU) is the third determinant, followed by perceived usefulness (PU), perceived ease of use (PEOU), and perceived utility (PU). Perceived usefulness (PU), according to Davis (1985).

Literature review

The impact of electronic banking on the financial performance of Nigerian deposit money banks was investigated in a study by Joseph et al. (2021) using data from published financial statements of the banks under investigation as well as the Statistical Bulletins of the Central Bank of Nigeria and the National Bureau of Statistics for a variety of years. The study employed an ex-post facto research design and a normality test to determine the quality of the data, as well as descriptive statistics and a multicollinearity test, which found that the independent variables were good. Regression was used to test two hypotheses.

A panel autoregressive least squares approach was used in Lawrence and Donald's (2023) study on electronic banking and the financial performance of deposit money institutions in Nigeria. The goal of the study was to determine how e-banking affected a subset of Nigeria's deposit money banks' (DMBs) financial performance. The research encompasses the years 2009 to 2020 for 15 DMBs, with data gleaned from their financial statements and the CBN statistical bulletin. ATM and MPAY are negatively significant, POS, WEB, and M-CASH are positively significant, while NIP is adversely negligible, according to the Panel Autoregressive Least Squares results. The study suggests that since POS, WEB, and M-CASH transactions have a beneficial impact, DMB management should prioritize them more. Nigerian banks' performance from 2009 to 2017 is examined by Enoruwa et al. (2019) about electronic banking. Regression analysis was used to look into the kind and strength of the relationship between the independent and dependent variables. The research indicates a good and robust association between bank performance and electronic channel items like ATMs and mobile payments.

Mobile banking

Mobile banking transactions can take two forms: account inquiries that don't require payment, like checking account balances, credit limits, or transaction histories, or those that do and require payment, like mobile payments or mobile purchases. This system notifies users about their accounts through short text messaging. Although there are many different types of mobile payments, the devices that process them can be divided into two groups: proximity payments and remote m-payments (Agarwal et al., 2017). Payment service providers (PSPs), like Google and PayPal, handle in-store portable installments via a cloud-based remote method. On the other hand, proximity payment necessitates that the customer presents a credit card, smartphone, or tablet device to a payment terminal to complete the transaction.

Real-Time Gross Settlement (RTGS)

Real-time online fund transfers (RTGS) are electronic platforms that enable commercial banks and



third parties to transact huge amounts of money in real-time. This platform allows for both gross and individual transaction processing. Currently, the Nigerian Settlement System (NISS) is the name given to the Nigerian RTGS system. Through the use of real-time gross settlement systems (RTGS), securities or money can be exchanged between banks on a gross basis in real time. When a payment is settled in real time, there is no waiting period and it is deemed final and non-refundable. A gross settlement transaction is one-to-one and is not bundled or netted against any other transaction. Thus, a money transfer system can be defined as an RTGS system.

NIBSS Instant Payment (NIP)

Low-volume, one-time payments are the main use case for this interbank payment service. When NIP was first launched in 2011, it was primarily utilized for single-payment transactions (low volume) and provided real-time interbank payment services. The favored fund transfer website for the Nigerian banking sector, this payment platform ensures the recipient receives benefits right away. Through a variety of networks, including internet banking, bank branches, kiosks, smartphone applications, unstructured additional service data (USSD), point-of-sale (POS), automated teller machines (ATMs), and others, Nigerian banks have revealed NIP to their clientele over the years.

Conceptual review

Concept of electronic banking

Electronic banking is the use of the Internet as a remote delivery channel for services like opening an account, transferring money between accounts, and presenting and paying bills electronically. Electronic banking has been around for a while in the form of telephone transactions and automated teller machines (ATMs), but in more recent times, the internet has transformed it as a new delivery channel that has made banking easier for banks and customers alike. Electronic banking is the conduct of banking business electronically via the use of information communication technology to support both short-term and long-term goals.

Concept of financial performance

Return on equity and return on assets are the two main metrics used to quantify a corporate enterprise's profitability, which is known as financial performance. Businesses and people who are motivated by profit are always looking for new and better ways to lower their production costs, better meet customer needs, and increase profits. These efforts can take the form of better products, procedures, or organizational structures. Depending on the situation, this search may be conducted formally through R&D programs or more casually through "tinkering" or trial-and-error methods. Financial performance is measured by a company's ability to generate income and expand its operations while also demonstrating how well the company is positioned. The way a company uses resources from its main line of business to produce revenue is measured by its financial performance.

The formula for return on assets (ROA) is expressed below as:

$$\text{ROA} = \frac{\text{Profit before tax}}{\text{Total Asset}}$$



METHODOLOGY

The ex-post-facto research design was adopted in this investigation. Ex-post Facto analysis looks for potential causative factors in previous events or data to identify the elements associated with a certain occurrence, circumstance, event, or behavior. As of March 2024, there were over 40 deposit money banks in Nigeria (CBN, 2021), and all of them are included in the study's population. These banks are listed with the Nigerian Exchange Group (NXG). In this investigation, the Census sample technique will be used. Information is gathered using this sampling technique from a small number of well-chosen population unit. As a result, the study's sample size includes seven (7) Nigerian deposit money banks; First Bank, United Bank for Africa, Guarantee Trust Bank, and Zenith.

Model specification

In this study, a multiple regression model will be adopted to test the effect of electronic banking on the financial performance of commercial Banks in Nigeria. The model is shown below as;

$$Y = f(\text{MB, RTGS, NIP}) \text{-----} (1)$$

$$\text{ROA} = a + \beta_1\text{MB}x_1 + \beta_2\text{RTGS}x_2 + \beta_3\text{NIP}x_3 + e. \text{-----}(2)$$

Where:

- Y = Dependent variable (Return on Asset ROA)
- a = the intercept
- β = the coefficient of the independent variable (E-banking)
- X = Independent variables (E- banking)
- X₁ = Mobile banking (MB)
- X₂ = Real-Time Gross Settlement (RTGS)
- X₃ = NIBSS Instant Payment (NIP)
- e = error term

DATA PRESENTATION AND ANALYSES

Empirical results

Both multiple regression analysis and descriptive analysis were employed in the investigation. The Statistical Package for the Social Sciences (SPSS Version 21) was used to compute this analysis. Regression analysis and descriptive statistics will be utilized to analyze the secondary data used in this study. Regression analysis is used in descriptive statistics to ascertain how one variable affects another. Mean, median, standard deviation, minimum, and maximum are utilized to analyze the variables that have been chosen.



Table 1: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Return on Asset (ROA)	40	9.00	20.00	15.2321	2.28028
Mobile banking (MB)	40	10.00	23.00	17.4821	2.64225
Real-time gross settlement (RTGS)	40	3.00	8.00	6.2143	1.42337
Instant Payment (NIP)	40	3.00	12.00	7.9643	2.14021
Valid N (listwise)	40				

Source: SPSS Version 21

Table 1 presents the descriptive statistics for both the dependent and independent variables of the study. The number of observations (denoted with N) for the study as shown in the table above reflects a value of 40, this is a result of the combination of the eight (8) sampled banks during the analysis while the actual year covered is (2010Q1-2024Q1).

The return on asset (ROA) has a maximum of 20.0% and a minimum of 9.0%, respectively. Additionally, a mean of 15.2% with a 2.28% variation is included in the table. The minimum and maximum percentages for mobile banking (MB) are 10.0% and 23.0%, respectively. On the other hand, the mean and standard deviation for the period under consideration were 17.48% and 2.64%, respectively. The minimum and maximum values for real-time gross settlement (RTGS) are 3.0% and 8.0%, respectively. On the other hand, the mean and standard deviation for the period under consideration were 6.21% and 1.42%, respectively. The minimum and maximum values for Instant Payment (NIP) are 3.0% and 12.0%, respectively. In contrast, the mean and standard deviation for the time under consideration were 7.9% and 2.14%, respectively.

Diagnostic statistic

To ascertain whether the data utilized in the analysis were appropriate, multi-collinearity and linearity tests are performed in this section.

Table 2: Multicollinearity Test

Variables	VIF	1/VIF
Mobile banking (MB),	.746	1.340
Real-time gross settlements (RTGS),	.995	1.005
Instant Payments (NIP)	.745	1.342
Mean VIF	.828	

Source: SPSS Version 21

Two values are obtained from the multi-collinearity test mentioned above: the variance inflation factor (VIF) and tolerance. The degree to which the other independent variables in the model do not account for all of the variability of the designated independent is shown by tolerance. This

suggests a significant multiple correlation with other variables, which may lead to multi-collinearity if the value is very small (less than 10). The variance inflation factor, or VIF for short, is equal to the tolerance value minus one (tolerance divided by 1). According to Pallant (2016), multi-collinearity would be indicated by VIF values greater than 10, which would be concerning. However, in this instance, all values are less than 10, demonstrating the lack of multi-collinearity.

Linearity test

A multiple correlation analysis was performed to see whether the data set was linear. The following table shows a strong linear relationship between the variables under study and that changing the independent variables will likewise change the dependent variable. The data set's linearity is further demonstrated by the flagging ** of each variable's coefficient, which denotes a strongly linear relationship.

Table 3: Correlation analysis showing linearity between variables

		Return on Asset (ROA)	Mobile banking (MB)	Real-time gross settlement (RTGS)	Instant Payment (NIP)
Return on Asset (ROA)	Pearson Correlation	1	.554**	.024*	.609**
	Sig. (2-tailed)		.000	.863	.000
	N	56	56	56	56
Mobile banking (MB)	Pearson Correlation	.554**	1	.023	.501**
	Sig. (2-tailed)	.000		.866	.000
	N	56	56	56	56
Real-time gross settlement (RTGS)	Pearson Correlation	.024*	.023	1	.044
	Sig. (2-tailed)	.863	.866		.746
	N	56	56	56	56
Instant Payment (NIP)	Pearson Correlation	.609**	.501**	.044	1
	Sig. (2-tailed)	.000	.000	.746	
	N	56	56	56	56

** . Correlation is significant at the 0.01 level (2-tailed).

Multiple regression analysis

The impact of electronic banking systems on the financial performance of Nigerian commercial banks is determined through the application of multiple regression analysis. Return on asset (ROA) is the financial performance metric, and the electronic banking systems taken into consideration are Mobile Banking (MB), Real Time Gross Settlements (RTGS), and Instant Payments (NIP).



Table 4: Regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.674 ^a	.454	.422	1.73304

a. Predictors: (Constant), Mobile banking (MB), Real time gross settlement (RTGS), Instant Payment (NIP).

b.

Table 5: ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	129.803	3	43.268	14.406	.000 ^b
	Residual	156.179	52	3.003		
	Total	285.982	55			

a. Dependent: Return on Asset (ROA)

b. Predictors: (Constant), Mobile banking (MB), Real-time gross settlement (RTGS), Instant Payment (NIP),

Table 6: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error		Beta		
	(Constant)	6.340	1.887		3.359	.001
	Mobile banking (MB)	.288	.102	.333	2.811	.007
	Real time gross settlement (RTGS)	.019	.165	.012	.114	.909
	Instant Payment (NIP)	.470	.126	.441	3.718	.000

a. Dependent: Return on Asset (ROA)

Interpretation of result

The purpose of the aforementioned multiple regression analysis was to ascertain how Nigerian commercial banks' financial performance was impacted by electronic banking systems. Based on the aforementioned, the impact of mobile banking (MB), real-time gross settlements (RTGS), and instant payments (NIP) on the financial performance (ROA) of Nigerian commercial banks was evaluated. According to Table 4's model summary, the total electronic banking system's contribution to Nigeria's commercial banks' financial performance (or return on asset, or ROA) is



approximately 67%. Whereas exogenous factors that were not taken into account for the study account for the remaining 33%. Given that the model generated a ($r = .674$, $R^2 = .454$, $F = 14.406$, and $\text{sig} = .001$), this is still statistically evident, demonstrating the unique contribution even more

Test of hypotheses

Statement of hypothesis one

H₀₁: The financial success of Nigeria's commercial banks is not significantly impacted by mobile banking.

Decision:

If the p-value is greater than 05, the null hypothesis should be accepted; if not, it should be rejected, according to the data in Table 4.6 at the 95% confidence level. The p-value (sig) for mobile banking (sig = .007) is less than 05. This is by the decision rule. The alternative, which claims that mobile banking significantly affects the financial performance of commercial banks in Nigeria, is thus accepted, and the null hypothesis is rejected.

Statement of hypothesis two

H₀₂: Real-Time Gross Settlement (RTGS) has no significant effect on the financial performance of commercial banks in Nigeria.

Decision:

The option is to accept the null hypothesis if the p-value is greater than 05 and reject it otherwise, based on the data in Table 4.6 at a 95% confidence level. This decision rule indicates that the p-value (sig) for (RTGS) = .909 is less than 05. Therefore, we reject the null hypothesis and adopt the alternative, according to which there is no discernible impact of Real-Time Gross Settlement (RTGS) on the financial performance of Nigerian commercial banks.

Statement of hypothesis three

H₀₃: NIBSS Instant Payment (NIP) has no significant effect on the financial performance of commercial banks in Nigeria

Decision:

The option is to accept the null hypothesis if the p-value is greater than 05 and reject it otherwise, based on the data in Table 4.6 at the 95% confidence level. This decision rule indicates that the p-value (sig) for NIP = .000 is less than 05. As a result, we support the alternative, which claims that NIBSS Instant Payment (NIP) significantly affects the financial performance of Nigerian commercial banks, and reject the null hypothesis.

CONCLUSION AND RECOMMENDATIONS

Electronic banking systems have been found to have a considerable impact on the financial performance of commercial banks in Nigeria. This conclusion has been drawn from the evaluation of these systems. This is because electronic banking automates a lot of processes, which lowers bank operating expenses. More earnings result from this. But careful planning, as well as financial investments in technology and security, are necessary for successful execution.

Based on the summary and conclusion of the study, the following recommendations are proffered:



1. It is recommended that managers of commercial banks consistently enhance the user experience of electronic banking systems to ensure that they are intuitive, safe, and compatible with multiple devices.
2. Customers, particularly those in underbanked areas, should be regularly informed by commercial bank managers about the advantages and security features of online banking. Adoption can be stimulated and awareness raised by targeted marketing activities.

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